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ABSTRACT

Effects of Teacher Training for Individual Differences to Improve the Academic Performance of Special Education Inclusion Students

by

Marsha Swindler

M.A., Azusa Pacific University, 2002
B.A., Azusa Pacific University, 2000

Dissertation Submitted in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Philosophy Education: Special Education

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ABSTRACT

Regular education classroom teachers currently face an influx of students with learning styles that create challenges to typical pedagogical practices. The least restrictive environment listed in the special education student Individualized Educational Program (IEP) continues within academia to alter regular mainstream education environments. Without teacher training to prepare educators for changes, special education student academic outcomes are at risk for decline. The purpose of the study was to determine if there is a difference in the academic success of special education inclusion students when their teachers do or do not have training. The problem was addressed by answering the question that teacher training positively affected the academic success of special education inclusion students. A quasiexperimental qualitative collective case study examining the relationship between teacher training and student academic achievement included students from combined mathematics classes. Participants were selected from a population of 210 special education inclusion students. The survey and nonsurvey data collection included a teacher survey and a learning styles survey for students. Multiple nonsurvey instruments including pre- and posttests, observations, and semester grades were interpreted with cross-case data analysis that examined the data collection, coded into central tendency, range, and theme categories. The study identified an acute need for teacher training recommended for workshops, seminars, or in-service programs. Regardless of placement in or out of special education, implications for positive social change directly influence student academic success when trained teachers provide interventions and accommodations in the regular education environment.

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DEDICATION

The intellectual and emotional potential to learn lies within every child, dependent upon educators to discover. This manuscript is dedicated with gratitude to the individuals, children and adults, who continue to inspire others to seek the intellectual and emotional potential within every human being.

ACKNOWLEDGMENTS

The collaborative efforts of educators over the last 30 years deserve recognition for inspiring the quest for a better way to serve the majority of the levels of learners. My children and my extended family continue to inspire me to share that anything can be accomplished with dreams and aspirations. My husband provided the opportunity by recognizing my heartfelt desire to make the world a better place for the majority of students within a system in need of change, and he took a chance. Walden University facilitated the process for my passion to become a reality for students in need of an advocate. Allowing me to become an instrument of change through others has been my humble privilege. The majority of students can learn if given a chance to be recognized, and it is the responsibility of educators to seek individual strengths in need of recognition.

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CHAPTER 1: INTRODUCTION TO THE STUDY

"The will is free and individuals can make a difference."
Ludwig von Bertalanffy (1967)

Introduction

Special education inclusion students have the capacity to learn, albeit sometimes with an alternate learning style. Regular education classroom teachers currently face an influx of students with learning styles that create challenges to typical pedagogical practices. An understanding of the concepts of alternate styles of learning will serve regular education students as well as the special education population of learners. The need for teacher training is acutely apparent as the inclusion law, mandated by the least restrictive environment clause listed on the special education student Individualized Educational Program (IEP), continues within academia to alter the regular mainstream education environment (Cauley, Linder, & McMillan, 2001). Without teacher training to prepare educators for changes within the classroom, teachers may fear the inclusion students' style of learning (Aydin & Oztutuncu, 2001), doubting that there is an ability to learn. As a result, special education inclusion student academic outcomes are left at risk for decline (Celletti, 1999; Powell & Napoliello, 2004).

The research study, the academic success of special education inclusion students, examined the relationship between teacher training and student academic performance. It was not clear if teacher training was predictive of the academic success of special education inclusion students. The purpose of the study was to determine if there was a difference in the academic success of special education inclusion students when their teachers do or do not have training for individual differences. The problem was addressed

by asking the question: How will teacher training for individual differences affect the academic performance of special education inclusion students?

Teachers without training for individual differences may lack an understanding of student behavior and learning styles outside the norm (Askenazy, Benoit, Lecrubier, Lestideau, & Myquel, 2002). A quasiexperimental collective case study examining the relationship between teacher training and student academic achievement was implemented to gather data to examine if there were differences in the academic performance of special education inclusion students taught by trained and untrained teachers.

The Problem

It was not clear if teacher training was predictive of the academic success of special education inclusion students mainstreamed into regular education classrooms. Regular education classroom teachers currently face an influx of students with learning styles that create challenges to typical pedagogical practices. Coping with the myriad of differences that tend to influence a regular education classroom when inclusion students are mainstreamed can overwhelm veteran teachers (Celletti, 1999; DuPaul, 1997). Adolescent impulsivity, that is, “having the power of or actually driving or impelling; acting momentarily” (Merriam-Webster, 2003, p. 627) can disrupt classroom environments, often times leading to poorly made decisions on the part of students and the educators who have not received proper training to diffuse the disruption. Impulsivity,

hyperactivity, disorganization, inattention, and distractibility can be minimized by concentrating on student strengths and not elaborating weaknesses.

As unknown factors of classroom disruption to the regular education classroom teacher arise, students that show signs of behavior and learning outside the norm may need to be monitored in the area of impulsivity. Well-designed program expectations can turn impulsivity and hyperactivity into academic success (Carbone, 2003; DuPaul, 1997; Essau, 2004) by raising the awareness levels of the students and the teachers. Academic and behavioral standards are as necessary as the curriculum (Gerrard, 2000) to maintain much needed classroom control.

The effects of the environment directly affect the potential to learn (Aydin and Oztutuncu, 2001). Within an average size classroom of 35 students, the different modalities of learning can reach in excess of 55 areas, ranging from gaps in language learning to distractibility to physical handicaps (P. Gaskill, personal communication, July 20, 2004). Lack of information regarding the modalities of learning that exist within one classroom environment leaves classroom teachers at a disadvantage, causing teachers to not only doubt the abilities of the students (Snowden, 2003), but to doubt themselves. Setting a higher bar of expectations in the classroom environment where learning is expected and not doubted prepares the majority of the various levels of students for real life challenges outside the protected school environment.

Currently, not all students succeed and many do not meet the academic criteria necessary to graduate from high school. The gap between regular education and special education widens without teacher training and the incorporation of individual differences

training into the regular mainstream curriculum. Merging the skills for knowledge acquisition that reach the majority of the levels of learners strengthens the mainstream curriculum in ways that adapt to the majority of learners. The study focus examined teacher training effects on the academic success of special education inclusion students mainstreamed into regular education classrooms.

A mandate for the least restrictive environment for special education students continues to alter regular mainstream education. Currently, special education students are enrolled in mainstream classes without considering that the teachers are not trained to recognize that individual differences do not indicate a lack of potential to learn. Without teacher training to prepare educators for the changes, student academic outcomes may be at risk for decline.

Background of the Problem

Current pedagogical trends are in transition within school districts in need of workshops, seminars, and in-service training sessions for multiple intelligences and individual learning styles to ease the transition process (Carbone, 2003; Dreher, 2003). Deemed as the least restrictive environment through state mandated policy from special education student Individualized Educational Programs (IEP), the regular education classroom teachers are currently faced with an influx of students with learning styles that create challenges to typical pedagogical practices. The perception that students from outside the regular mainstream enrollment cannot learn within a regular curriculum

environment stems from a lack of training and experience (Celetti, 1999; Nugent, 2001; Snowden, 2003).

As the number of inclusion students increases, teachers expressing the feeling of inadequacies escalate possibly due to a lack of strategies to provide adequate academic preparation as discovered in studies by Carbone (2003) and DuPaul (1997). High school, the last stage of education for many students before real world experience beckons, challenges students. Educators need to rise to the challenge of preparing the majority of the levels of students for the demands of the 21st century. Bridging the gap between school and the community by abandoning past practices for new innovative teaching takes courage, according to Fenden (2006). The topic of classical and contemporary human learning was examined and applied to a fictional high school setting where the best-case scenario of teaching and learning was applied to make sense of education. The premise incorporates five major areas of human learning: "nature of intelligence, motivation of students, the way students learn, what students should learn, and how learning should be assessed" (Fenden, 2006, p. 1). Each area compared current pedagogical practices with what should and could be done in education, based on the most current research (Carbone, 2003; DuPaul, 1997; Essau, 2004; Fenden, 2006).

Frustration among the teachers with the increased number of mainstreamed special education students may be due to a fear of the unknown learning styles, but not enough was known of the effects of teacher training (Celletti, 1999; Snowden, 2003). The legislation in favor of students with disabilities is in place, but due to mandates for more testing, state standards, and more rigorous goals for regular education, unrealistic

expectations for special education students exist (Bui, Deshler, Schumaker, & Vernon, 2000). Increased pressure on teachers to improve test scores adds to the frustration because under prepared inclusion students unfortunately lower standardized test scores.

Studies conducted from the onset of mainstreaming the special education students that began in the 1970s did not include topics of teacher training or standardized test scores because the focus was on getting the special education students out of the one room classroom into the mainstream environment (Kneeler & Tarver, 1977). The concerns for social integration of students with special needs overshadowed the need to examine more closely the educational outlook of what might happen when the students were included into the curriculum of regular education without accommodations. New problems continue to arise because students are taught by teachers with preconceived doubts whether basic teaching courses are adequate training to do what is best for the newly acquired students (Celetti, 1999; Lavoie, 2005; Levine, 1995; Snowden, 2003).

Starting with changes in the terminology, *mainstreaming* has more recently become the old term used when referring to *inclusion* according to Swinderek (1997), but both terms remain necessary when explaining the plight of the students involved in the transitional program. The transition that started in the 1970s continues almost 40 years later with as many unanswered questions as in the beginning stages of the least restrictive environment placement of students from the special education programs. Many of the new questions under consideration when discussing the students included in the mainstream education classes stem from the changes that affect most areas of education: the adoption of state standards, the technological advances of the 21st century, and the

changes with family dynamics that have added to the success or failure of student achievement (Kaplan, D., Kaplan, H., & Lui, 2001).

In the 1970s the majority of families consisted of two-parent households with stay-at-home mothers available to monitor things such as the daily whereabouts of the children, the support for schoolwork with the monitoring of homework assignments, and the close contact between school and home to ensure the success of students mainstreamed into a new learning environment (Kelley & Stack, 2000; Swinderek, 1997; Wood, 1997). Home computers, cell phones, cable television, CD players, MP3 players, text messaging, and Instant Messaging were nonexistent distractions in the 1970s (Calvert, Conger, & Murray, 2004). The seven-channel television set was turned off and the AM/FM transistor radio earphones were put away until homework was complete because parents and grandparents were available to supervise (Kneeler & Tarver, 1977).

The stable family structure of the1970s was left in the wake of the technological explosion of the new millennium where distractions increased and families not only lost the stay-at-home parent, but also lost the cohesiveness of a two-parent household due to the escalating rate of divorce (Dobson, 1985). Disconnected families led into disconnectedness at school. Identifying factors that relate to youth who did or did not feel connected to school led into the development of school based prevention strategies for the highest at risk for behavioral and health issues (Bonny, Britto, Hornung, Klostermann, & Slap, 2000). Family dynamics changed student achievement, placing more demands on teachers to make up for what was lacking in the family (DuPaul, 1997).

School systems answered back with state standards in search of a leveling effect on which to monitor student achievement (Bui, Deshler, Schumaker, & Vernon, 2000).

Nearly 2 decades have passed since students with disabilities were brought out of the one room special education environment into an environment of the regular student population reflecting progress in many areas (Swinderek, 1997). The reciprocal effect from the span of time has increased demands in other areas. In the 1970s mainstreaming discussions did not include teacher training, state standards, advanced technology at the fingertips of most students, or the welfare of students due to inadequate family environments. Raising awareness with training for the majority of teachers that includes developing school-based strategies will improve academic achievement for the majority of the levels of learners.

An urgent need exists in current pedagogical trends to recognize that different learning styles need not lead to a decline in quality classroom environment (Carbone, 2003; Dreher, 2003), but will significantly improve it. According to the Kelley and Stack study (2000), which used collected data from the World Value Study Group (1991), an international association of social scientists, human beings, not exclusively special education students, are affected from outside sources. The compilation of information is further discussed in the literature review in chapter 2 that defines the incorporation of thought recognition into teacher training programs. Easing teacher fears of the unknown factors that accompany the inclusion students is paramount.

Distractible students are at risk for academic decline (Askenazy, Benoit, Lecrubier, Lestideau, & Myquel, 2002). The authors examined the controversial

relationship between anxiety and impulsivity in adolescents at risk for academic decline. A need to monitor impulsivity in students that show signs of behavior and learning outside the norm (p. 219) may be an unknown factor of classroom disruption to the regular education classroom teacher, along with other flaws in the decision-making process. Flaws in the decision-making process need not influence educators to lower standards or expectations for students to achieve success. On the contrary, well designed program expectations can turn impulsivity and hyperactivity into academic success (Carbone, 2003; DuPaul, 1997; Essau, 2004) by raising the awareness levels of the students and the teachers. Academic and behavioral standards are as necessary as the curriculum, and properly implemented, lead to a mutual understanding for the protection of self-image and individual awareness (Gerrard, 2000), while maintaining much needed classroom control.

Parental expectations were found to cause undue stress on the children in families when there is a child identified with a disability (Aydin & Oztutunctu, 2001; Bednar & Fisher, 2003; Bolland, 2001; Darling, 2000; Kaplan, D., Kaplan, H., & Lui, 2001). Details and descriptions of the relationship of children with disabilities and other family members can be found in the literature in chapter 2. Identifying factors that relate to youth who do or do not feel connected to school lead into the development of school-based prevention strategies for the highest at risk for decline in academic achievement.

Cheyne (1999) completed a detailed examination of thinking and speech looking into ways in which parents, teachers, mentors, and tutors can more effectively assist learners. The classical theory of Vygotsky (1962) is used to understand the contemporary

needs of the 21st century inclusion students in the Cheyne (1999) study. The study found that many problem behaviors are not related directly to underachievement, but are associated with attention problems.

Attention problems have a negative effect on academic achievement. The results from a study done by Barbetti et al. (2002) indicate that a clear understanding between problem behaviors and academic achievement will help generate appropriate assessment called performance oriented assessment. Referred to as performance-based assessment, prevention and intervention strategies are included for students identified with a learning disability. The special education community of teachers and learners seek more hands-on interactive curriculum that can be evaluated through performance-based assessment that directly affects learners outside of the logical and linguistic realm of teaching and learning.

Published information from O'Neal (2004) supports that an intense teaching group using more hands-on curriculum made up half the gap in educational assessment, where other students without the hands-on curriculum fell further behind. The research study examined the activity of the brain revealing that levels of serotonin directly affected student performance (Askenazy, 2000). The discovery of the serotonin phenomenon offering additional insight into student academic performance will be carefully outlined in the literature review of chapter 2.

An evaluation, before and after, was conducted using results from tests, brain scans, and serotonin levels. An area of the brain known as the word-form region indicated more activity in the group that was taught with the newly formed systemic hands-on

interactive curriculum (Essau, 2004). Information to keep teachers apprised of current practices with psychosocial difficulties concerning school age children and adolescents was stressed in the study by Schlozmans (2003), a clinical instructor in psychiatry specializing in studies of brain activity in children with learning difficulties (Hancock, 1996; History of Drake Institute, 2001).

Teacher training sessions could inform educators of the most current discoveries regarding serotonin levels in the brain related to prescription drugs, curriculum instruction, alternate assessment, and testing (Albers, 2001; Kish, 2000; Retz, W., Retz-Junginger, P., Rosler, M., Supprian, T., & Thome, J., 2004; Valenstein, 2006). The results would directly affect the needs and desires of teachers to keep current with information regarding the inclusion student learning styles (Celetti, 1999; Feingold, 1975; Lavoie, 1989; Snowden, 2003), raising the level of understanding. Unfortunately, teachers currently expressing a need for training to better understand the academic achievement of the majority of students (Celetti, 2001; Snowden, 2003) are not heard due to the strains on the educational system to meet the needs for more mandated standardized testing.

A nationwide survey (Kim & Sunderman, 2004) concluded that a flawed system exists with the No Child Left Behind (NCLB) legislation that mandates standardized testing. A myriad of paper trail requirements, lack of funds, and a poor response from the target population of students intended to reap the benefits of the services were reported in the survey results. Triangulation of performance-based assessments coupled with standardized testing results portrays a truer picture of academic achievement, answering

teacher desires for a better understanding of the academic achievement of the majority of the levels of learners (Celetti, 1999; Nugent, 2001; Snowden, 2003).

The standardized exam driven efforts for school reform in the 1980s failed, thus substantiating the outcry against another national testing mandate (Perkins-Gough, 2005). In the study, testing experts warned against single test results as a sole source of information for decisions in education. High stakes testing pressure takes precedence over performance-oriented assessment due to the high costs of NCLB mandates for annual testing. Insufficient funding leads the complaints of the negative affect on academic achievement directly related to NCLB (Thornton, 2005).

While No Child Left Behind (NCLB) brought federal expectations of universal proficiency, the fairness of NCLB is a hot debate in and out of the courtrooms. Educators cannot control that snapshot test scores are used annually to measure the effectiveness of schools under NCLB legislation. Students come and go within districts and NCLB provides nothing for the flux (Thornton, 2005). Teachers want and need a measure of productivity that is fair, explaining how to teach each new approach that follows individual student progress, and can be used for accountability. Sroufe and Wurtz (2003) found that government appointed positions are created to support interests directly related to the White House agenda, not necessarily related to what is best for the students.

An alternative plan to national testing was found in a study conducted by Davey and Neill (1991) from the National Goals Panel and the National Council on Educational Standards and Testing suggesting performance assessment. The study results suggest that proposals regarding performance-based assessments are out there for consideration

(Davey & Neill, 1991; Echternacht, 1989; Perkins-Gough, 2005). Assessment and accountability in conjunction with fairness is the central issue presented by Wenning (2005). Raising teacher awareness of the multitude of options available to reach the majority of the levels of learners is possible through training programs, sadly absent from current teacher preparation programs (Celetti, 1999; Gardner, 1983, 1993, 2006; Nugent, 2001; Snowden, 2003).

A research study conducted by Schubert (2006) revealed that pressure of test-based curriculum distracts teachers from the real focus of what it means to teach. Looking to sources outside of education for insight into enhancing the curriculum and teaching in education was the focus of the study where literature, art, prose, and poetry were unexpectedly found to serve as a hidden wealth of information to educators. Schubert used a research in education focus and explored *Speak, Hands* by Lillian Moats (2006, found in Schubert, 2006) to offer educational insights. Regardless of mandated testing, a discovery of self-understanding with purpose and direction in life should be taught to the majority of students.

The autobiographical narrative of Moats reveals a self-understanding, as the author relates to the Dewey (1915, found in Craver & Ozmon, 1999) view of education as a coordinated effort of manual activities. Mind body dualism, a Dewey concept, is stressed by Schubert (2006) as a fact that should be taught to the majority of teachers, along with teaching teachers that the individual is part of a larger system of the whole of humanity (Bertalanffy, 1968). If educators are taught to recognize that there will be difficulties in switching from working with regular education students to working with students with

alternate learning styles (Celletti, 1999) the gap between special education and regular education may narrow.

The background of the problem spans four decades with a hidden advantage. Teacher training for alternate learning styles has been further investigated and better understood as a result of the research study. The incorporation of alternate learning styles into pedagogical practices benefits the majority of students, regardless of placement in or out of special education programs. Schools are based in linear curriculum presentation, but students are in need of flexible nonlinear teaching styles, according to a study conducted by Reilly (1999). Effective student learning is blocked because teachers and policy makers do not fully understand how learning occurs. Research about learning has emerged in cognitive science (Askenazy, 2000; Gardner, 1983; Lavoie, 1989, 2005; Levine, 1995; Masters & McGuire, 1994), but schools have not translated the information to teacher training programs or curricula (Gardner, 1983, 1993, 2006; Senge et al., 2003).

Purpose of the Study

The purpose of the quasiexperimental qualitative collective case study was to examine the relationship between teacher training and student academic performance to determine if there was a difference in the academic success of special education inclusion students when their teachers do or do not have training for individual differences. Special education inclusion students may be at a disadvantage for academic success when taught by teachers without training to recognize and incorporate individual differences into the mainstream curriculum. As a result of the study, a better understanding of teacher

training effects and support within the bounded system (Hatch, 2002, p. 31) of a high school in Southern California emerged.

Teacher training is in need of revision to incorporate programs that help skilled classroom teachers to understand what is necessary to become more effective professional developers working with special education inclusion students programmed into regular education classrooms. The results of the research study suggest that more trained teachers for individual styles of learning will narrow the gap between special education and regular education. The data and findings of the study serve to generate discussions that redefine policy decisions for funding teacher training programs to better understand how to teach students with individual differences currently enrolled in mainstream classrooms.

Specifically, the research study more clearly defining the qualitative methodology used in chapter 3 was designed to answer the question:

1. How will teacher training for individual differences affect the academic performance of special education inclusion students?

Other questions considered included:

2. What effects will teacher training have in regards to the inclusion of the majority of the levels of learners in the mainstream environment?

3. What do skilled teachers do to successfully complete the teaching and learning process in getting the information from the teacher to the student?

4. How will special educations inclusion students in California gain advantages for academic success when taught by teachers with training to recognize and incorporate individual differences into the mainstream curriculum?

Conceptual Framework

Students have the capacity to learn, albeit sometimes in an alternate learning style. Special education inclusion students enrolled in the regular education mainstream classrooms may have different styles of learning, but different styles of learning are not exclusive to special education students, as discussed by Howard Gardner (1983, 1993, 2006) in the theory of multiple intelligences. An understanding of the concepts of alternate styles of learning through teacher training will serve regular education students as well as the special education population of learners. Without teacher training to prepare educators for changes within the classroom, teachers may fear the inclusion students' style of learning, doubting that there may be an ability to learn. As a result, special education inclusion student academic outcomes are left at risk for decline (Bui, Deshler, Schumaker, & Vernon, 2000).

There is no single way to represent the data in a research study, so combining focuses together to form a theoretical framework is necessary (Huberman & Miles, 1994). Vygotsky's (1962) zone of proximal development (ZPD) espousing learning to differences among the practices in cultures (Cheyne, 1999; Dembo, 1994; Fenden, 2006; Gardner, 1983; Santrock, 1999) combined with the Gardner's (1983, 1993) multiple intelligences theory frames the focus of interest that may well serve the special education

community of learners. Further details discussing the aforementioned studies will be included in the literature review in chapter 2.

As alternate forms of learning are being explored, the Gardner (1983, 1993, 2006) approach using various intelligences to reach and teach is becoming more accepted into the mainstream curriculum (Celletti, 1999; Nguyen, 2002; Snowden, 2003). Using Vygotsky's (1962) ZPD as a basis for study, Cheyne (1999) discovered with research that once the potential to learn is understood, proper guidance to reach full cognitive development blocks previous patterns of negativity and impulsivity, thus supporting the urgency for teacher training. The capacity to learn will develop and according to Vygotsky (1962), even if the environment is not conducive to learning, learning will take place. The basic structure using the theories of Vygotsky and Gardner as a theoretical framework allows for inferences to be made from previous research for the need for teacher training. Promoting and developing an increased capacity for the academic success of the majority of the levels of learners was the goal of the study, leading to conclusions that explored teacher training.

Regular education classroom teachers currently face an influx of students with learning styles that create challenges to typical pedagogical practices. It was not clear that teacher training for individual differences was predictive of the academic success of special education inclusion students mainstreamed into regular education classrooms as studies examining the effects of teacher training were needed (Celletti, 1999; Nguyen, 2002; Snowden, 2003). School systems attend to the mechanics of education by fulfilling the enactment of federal, national, state, and local legislation to mainstream special

education students, but often ignore the needs of the individual. Individual identity is often concealed in hopes that no one would recognize the needs for special education accommodations (Guskey, 1996). Nearly four decades after the first enacted legislation that changed the environment for the special education learners, the needed studies for the effects of teacher training were missing.

First conceptualized in the early 1970s to provide the opportunity for the special education students to a free and appropriate education in the least restrictive environment, the 1975 legislation, Education for All Handicapped Children Act, as well as Title VI of The Civil Rights Act of 1964, and Title IX of the Education Amendments in 1972 were adopted to assist students with special needs. In 1964 government intervention raised awareness to the needs of students with disabilities, but a greater impact was felt for every classroom teacher in 1975 when the first Individuals with Disabilities in Education Act (IDEA) was adopted (California Education Code, 2006).

Despite the enacted legislation to include special education students in the mainstream environment, the students in the special education inclusion program, enrolled in the mainstream regular education classes, were not receiving the needed interventions and accommodations to succeed. Political, social, and economic decisions tend to reveal numerous pieces of legislation that negate each other within the environment of a school system that reflects a system in need of reform (Bui, Deshler, Schumaker, & Vernon, 2000).

How will teacher training reflect the needs of the special education inclusion students caught up in the confusion of the political, social, and economic decisions? Does

differential treatment exist if a regular education teacher has not previously been made aware of styles of learning that differ from the mainstream student, and is then asked to successfully teach special education inclusion students where "a real impact on the life chances of individuals," (Hatch, 2002, p. 16) is affected? Critical qualitative research examining the effects of teacher training specifically designed to incorporate individual differences into the regular mainstream curriculum as it applies to the special education inclusion students' academic success warranted questioning the status quo. The majority of students profited from the study that looked to discover whether training and support are effective in helping skilled classroom teachers of the regular education curriculum to become more effective professionals when special education inclusion students are enrolled in the mainstream classes.

Operational Definitions

Alternate learning style: an approach to learning emphasizes the fact that as a result of heredity, upbringing, and current environmental demands, different individuals have a tendency to both perceive and process information in very different ways (Schlaht, 2006).

Inclusion: special services are brought to the regular classroom, more beneficial to the child and less stigmatizing and harmful to achievement and self-esteem (Swinderek, 1997).

Individual learning style: used interchangeably in scholarly literature with the terms alternate learning styles and multiple intelligences (Gardner, 2006; Nguyen, 2002).

Individualized Education Program (IEP): a yearly education plan written by teachers, therapists, psychologists, and the child's parents for school age children with disabilities (Parentpals.com, 2006).

Learning disability: a child with average or above average potential has difficulty learning in one or more areas (such as reading or math) and exhibits a severe discrepancy between their ability and achievement (FAPE, 2006).

Least Restrictive Environment (LRE): an educational setting which gives students with disabilities a place to learn to the best of their ability and also have contact with children without disabilities (Parentpals.com, 2006).

Mainstreaming: refers to temporal, instructional, and social integration of special education students with normal peers to the fullest extent possible; the regular education teacher is the primary instructor with the resource teacher involved in special placement (Parentpals.com, 2006).

Multiple intelligences: a multitude of intelligences, quite independent of each other; that each intelligence has its own strengths and constraints; that the mind is far from unencumbered at birth; and that it is unexpectedly difficult to teach things that go against early “naïve” theories that challenge the natural lines of force within an intelligence and its matching domains (Gardner, 1993, p. xxiii).

Resource program: a program that serves the children's needs to learn specific skills within the least restrictive environment for part of the day (Parentpals.com, 2006).

Resource student: a child integrated into regular classrooms for most or part of the school day, supported by the special education staff, specifically a resource teacher (Winebrenner, 1996).

Special education programs/services: specially designed instruction for children over 3 years old with special needs who are found eligible for such services; these include special learning methods or materials in the regular classroom, and special classes and programs if the learning or physical problems indicate this type of program (FAPE, 2006).

Assumptions, Limitations, and Delimitations

The study sought to determine if the incorporation of teacher training into current pedagogical practice would heighten educator awareness of alternate learning styles, also know as individual differences, affecting academic outcomes for inclusion students. The research study assumed that (a) Students in special education have the capacity to learn, albeit in an alternate learning style; (b) Alternate learning styles are conducive to special education students as well as to regular education students; and (c) Adapting the curriculum may not be as difficult as once perceived through the eyes of regular education teachers.

The geographical area of the study was limited to a single school district, weakening reproduction of the results to be applied in areas other than an area of lower socioeconomic status. The scope of the study was narrowed through delimitations, which included the understanding that a comprehensive training program for teachers was not

included, as the study focus was to recognize a need for such programs. Training needs focused on teachers with a propensity to teach classes that included the placement of students in the regular education environment who were simultaneously enrolled in the special education program. The training needs focused district wide, not county or state wide. Examining classes with enrollment of inclusion students took priority over regular education classes without inclusion students. No attempt to evaluate teacher performance or rate teacher performance was included in the research study. No monitory value for incentives was placed anywhere in the study. Although the majority of students tend to benefit from the study, the primary focus was the special education community.

Significance of the Study: Social Change

Social change approaches range from the placing of a band-aid to the tearing down of a social order. Bringing about the change was not the goal of the qualitative study; that is left up to the powers that be. Challenged to discover what was needed to bring about social change to help students with alternate learning styles, the researcher looked for ways to better understand that students with alternate learning styles can learn, albeit in a way that is unfamiliar to many educators. A lack of teacher training may be forcing the gap to wider between regular and special education professionals.

The study was designed to gather data that would impact society by answering the call of many educators for training to supplement professional skills. Positive social change for the school community resulted with the study which examined more closely what teacher training could do for the academic success of special education resource

students currently taught by regular education teachers in need of training. The hidden advantage to teacher training for alternate learning styles incorporated into pedagogical practices benefits most students, regardless of placement in or out of special education.

In examining strategies to discover if there was a need to affect change in the special education community of students mainstreamed into the regular education environment, an urgent need for teacher training emerged from the educators asking for guidance. Discovering the need for social change does not come without risks, but without teacher training to prepare educators for the changes, student academic outcomes may be at risk for decline.

Current pedagogical trends are in transition and school districts need to incorporate workshops, seminars, and in-service training sessions for individual learning styles to ease the transitional process. Scholarly literature indicates the transitional process for the least restrictive environment for students has spanned four decades without a focus on teacher training (Celletti, 1999; Nguyen, 2002; Snowden, 2003). Chapter 2, the literature review, further outlines the details of the gaps that exist in the scholarly literature regarding the lack of teacher training. The study examined the uncertainty of the effects of teacher training as a predictor of inclusion student academic outcomes when the students are mainstreamed into the regular education curriculum. The data and findings of the study aid in filling the gaps in the literature.

Teachers resistant to the newly acquired student learning styles need training to ease the feelings of inadequacy often experienced with the inclusion enrollment (Celletti, 1999). Recognizing the need to incorporate teacher training to better understand and

accommodate individual differences is in need of immediate attention and was supported as a result of the research study. In addition, an understanding that properly implemented academic and behavioral standards are as necessary as the curriculum emerged from the study leading to a mutual understanding for the protection of self-esteem, while maintaining much needed classroom control.

The research study revealed what effects teacher training has on the academic performance of the inclusion students. Teacher training could inform educators that influences on the classroom environment and the learning process are disrupted when impulsivity, a flaw in the decision-making process, is misunderstood (Masters & McGuire, 1994). Educators who have not received proper training to diffuse an impulsive situation often times make poorly guided decisions, leading to more disruption.

Remaining reflexive by going into a school setting with the idea "to appreciate a situation," (Janesick, 2004, p. 151) and not change it, the need to establish objectivity as an ongoing focus of the study was primary. The researcher began with an understanding of the organization of the school, and then armed with knowing the idea for a study in enough depth, convinced the audience of the commitment (Hatch, 2002, p. 194), thus diminishing the challenge. By the time the study discovered the needs to be challenged, the researcher carefully articulated the study procedures and repeatability had been established. Gatekeepers granting access to the setting were approached, as the researcher brought something to the setting rather than take something away. According to Ratner (2002), "Objectivism is the highest form of respect for the subjects being studied" (p. 3).

Currently, the changes are monumental for classroom teachers facing a myriad of differences that influence a regular education classroom when inclusion students are mainstreamed. The least restrictive environment phenomenon spanning four decades overwhelms veteran teachers, but can be especially trying for educators unaccustomed to the professional practices required in teaching. In the implementation of social change, a coordinated effort for a "hybrid practice" (Field, 1991, p. 5) suggests a solution to bridge the old practices with the new to form the emerging paradigm: teaching the majority of the levels of learners within a regular education environment.

Summary

The purpose of the quasiexperimental qualitative collective case study was to examine the relationship between teacher training and student academic performance to determine if there was a difference in the academic success of special education inclusion students when their teachers do or do not have training for individual differences. Special education inclusion students may be at a disadvantage for academic success when taught by teachers without training to recognize and incorporate individual differences into the mainstream curriculum. A better understanding of teacher training and support, strengthened through the examination of student academic performance as a result of curriculum taught by teachers with training for individual differences emerged from the study data and findings. The study took place within the bounded system (Hatch, 2002, p. 31) of a high school in Southern California over the duration of one semester. The study location is further discussed in chapter 5 reflections.

Different styles of learning are not exclusive to special education students (Gardner, 1983, 1993, 2006), thus an understanding of the concepts of alternate styles of learning serve regular education students as well as the special education population of learners. The idea that the majority of students can learn, regardless of learning styles, stems from the theory of multiple intelligences (Gardner, 1983). The empirical strength of a theory is sound regardless of the variants of the terms used in the theory such as the variants of the terms multiple intelligences, alternate styles of learning, or individual differences that are used interchangeably in academia (Gardner, 1993; Nguyen, 2002).

A theory is a deductively organized system based in empirical evidence. Relationships between theories exist, but are not simple variants of one another. "As a science deepens its understanding of the world, narrower, less accurate and more special theories are revealed to be special cases of or explainable by derivation from broader, more complete, more accurate and more general theories" (Rosenberg, 2000, p. 103). In other words, a theory that has a base within another theory can be proven consistent by the observations connected with the newly formed theory. A schematic of the theory that emerged from the study data and findings can be found in chapter 4, including the deductively organized system that led to the theory development.

The base theory of Vygotsky's (1962) zone of proximal development (ZPD) has observations in intelligence and metacognition and the newer formed theory of Gardner's (1983, 1993, 2006) multiple intelligences (MI) also has observations in intelligence and metacognition, giving credibility to both theories. Each theory is able to stand

independent from one another as a relevant theory (Rosenberg, 2000, p. 130) and was used in the study.

The mainstreaming of inclusion students into the regular education environment was the phenomenon observed in the research study to test multiple intelligences (Gardner 1983, 1993), related to the zone of proximal development (Vygotsky, 1962). Rosenberg (2000) explains that the unobserved processes are identified from observable phenomenon, which in turn tests theories (p. 103). Regular education classroom teachers currently face an influx of students with individual differences, sometimes known as alternate learning styles, perceived to be inadaptable to the regular education curriculum (Snowden, 2003)—the unobserved processes. The need for teacher training is acutely apparent as the inclusion law, mandated by the least restrictive environment clause listed on the special education student Individualized Educational Program (IEP), continues within academia to alter the regular mainstream education environment (Cauley, Linder & McMillan, 2001)—the observable phenomenon that tested the theory.

Accelerated growth and discoveries in the potential to learn are increasing beyond human capability to stay current with the changes. The least restrictive environment phenomenon spanning four decades overwhelms veteran teachers, indicating that urgent changes are needed to understand that students with alternate learning styles can learn, even if the learning process is unfamiliar to educators. A lack of teacher training may be forcing the gap to wider between regular and special education professionals, explained in detail in chapter 2 of the literature review. Chapter 3 outlines the details so that replication and publication of the results will be possible for future studies.

CHAPTER 2: LITERATURE REVIEW

Introduction

The ultimate goal of the literature search was to better understand how to connect the academic achievements of the majority of students, regardless of learning styles, to teachers who must reach and teach various levels of learners in the mainstream environment. The current practice of lowering the academic bar is not the answer. The placement of special education inclusion students into the mainstream environment has been studied extensively. Gaps and deficiencies were found in the scholarly literature regarding teacher training, regardless of teacher requests for training needs (Celetti, 1999; Nugent, 2001; Snowden, 2003). The research study data and findings add a dimension to the current body of available scholarly literature on whether teacher training has an effect on special education inclusion students' academic success.

The focus of the review of the literature is explained with details in three related areas: the relationships of students, schools, and teachers to the broad focus of inclusion students in the mainstream environment in need of trained teachers to recognize learning differences. The lack of teacher training programs in alternate styles of learning in academia today left a need to reference peer related journals, articles, conference reports, and books in some cases further back than 5 years.

The most relevant and current related research and literature is organized around themes as depicted in Figure 1.

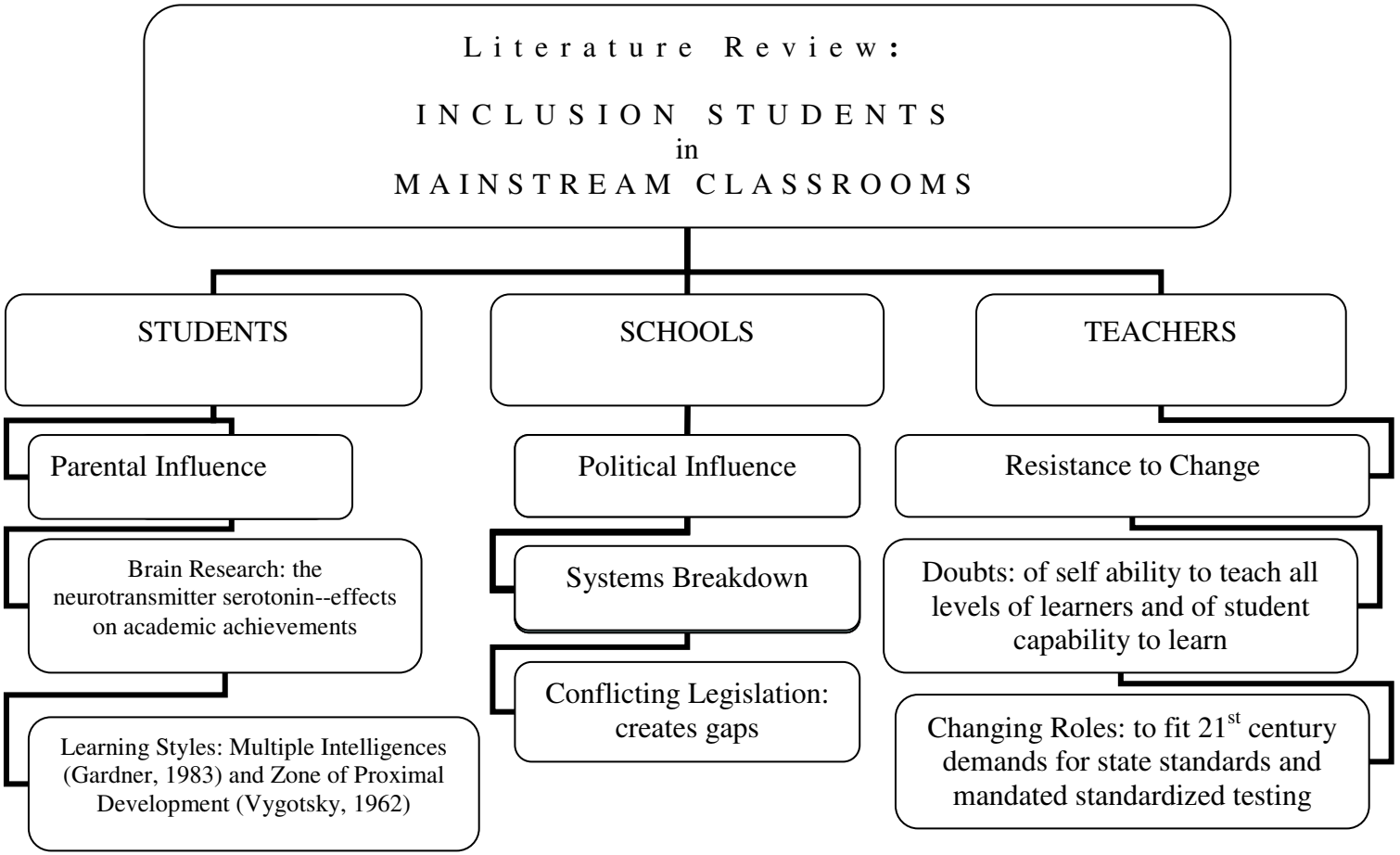


Figure 1. A graphic overview of the literature review provides a summary of the themes at a glance.

The first theme of the literature review focuses on inclusion students. An examination of peer-reviewed journal articles and recent academic studies analyzes parental influence that has changed due to changes in family dynamics over the 4-decade time span in which schools have been providing the least restrictive environment for students (Aydin & Oztutunctu, 2001). The next area reviewed under the student focus reveals literature detailing current cognitive development. Recent brain research relates the relationship of the neurotransmitter serotonin to adolescent impulsivity and academic achievement. Concluding the student focus with Gardner's multiple intelligences (1983) and Vygotsky's zone of proximal development (1962), the discussion of the theories lead into the second area of the review, the school focus.

The second focus area explored the systems of schools. Political influence undermines and negates areas of need (Guskey, 1996) for the students included in the mainstream environment. A breakdown in the systems process of schools reveals missing factors for most levels of learners (Gardner, 1993, 2006; Senge, 2000). A look into the national, state, and local levels of legislation provides insight into why gaps exist. Studies that are needed to provide adequate teacher training (Fenden, 2006) lead into the third area focusing on teachers' resistance to change.

Included in the third area of focus are teacher doubts regarding not only student abilities to learn, but teacher abilities to teach the majority of the levels of learners (Barbetti et al., 2002; Gerrard, Gibbons, Reis-Bergan, & Russell, 2000). Roles for teachers have changed over the course of the mainstreaming phenomenon that spans the last 2 decades. Discussed in the review will be 21st century demands on teachers that

influence most teachers, not only the teachers of inclusion students within mainstream classrooms.

The review of the literature began with a broad focus using the EBSCO host research databases (Walden University, 2005) to find current peer reviewed journal articles. Search terms such as inclusion, mainstreaming, least restrictive environment, special education, learning styles, multiple intelligence, individual differences, and teacher training were used to search the Educational Resource Information Center (ERIC) and Field of Psychology (PsycINFO). Pro Quest offered information to obtain the most recent scholarly work. IUCAT, Indiana University library's online catalog was necessary, and the Indiana University Document Delivery Service (DDS) was utilized with the assistance of the Walden University library staff.

Two local county libraries were accessed for full-text documents including peer reviewed journals and books. INFOTRAC was used through both local county libraries with General Reference Center Gold to locate, select, and download full-text articles, periodicals, and books. Materials were saved electronically for future reference until the hardcopies were needed. The MEDLINE database within two search systems was blocked. Current brain research data relating to inclusion student individual differences was needed to better understand the learning process. EDUSERV provided full text articles from the medical databases revealing information into brain research that relates directly to student academic achievement.

Student Focus: Parental Influence

The results of the study by Kaplan, D., Kaplan, H., and Liu (2001) reflect on how to better approach a variety of issues that student learners may face within the educational community. In any given classroom, the background of the students is vital to the outcomes of learning that must transpire. In framing an understanding of the problem, the authors recognize that a relationship exists between parental expectations for the children's academic performance and the influences of family climate, along with other psychosocial variables. An investigation into the negative self-feelings of the parents towards academics and how the children were influenced ensued.

The inductive methodological process started with a questionnaire given to a set of students twice, along with individual interviews. Specific conclusions were drawn from the individual interviews and questionnaires given to the parents. The parents were first approached as students, and then again as parents. The response of the original group of children was critical to the analysis. The conclusion reflects a pattern of negative self-feelings that influences poor academic performance. The authors were able to formulate a theory from the research that depicted a direct correlation between parent educational expectations and academic achievement.

The significance of the research compares links between parent expectation and student academic achievement. The justification of the results, the reciprocity of parent-adolescent relationships, and the methodology used to conduct the research substantiates the results. A direct correlation between parents' self-feelings and adolescent achievement, backed by the multistage study conducted by the authors, confirms results

from previous studies mentioned by the authors. The inductive schematic of the educational expectations and academic achievements in Figure 2 was developed by the researcher using the Kaplan, D., Kaplan, H., and Liu (2001) study.

The research methodology presented in chapter 3 for the research study followed a plan similar to the schematic in Figure 2. The study examined the inclusion students' academic achievements in mainstream classes in relationship to teacher training. An inductive process started with researcher observations (Powell & Napoliello, 2004) of inclusion students mainstreamed into the regular education environment over a 2-decade time period as described in chapter 1. A negative pattern was detected from the scholarly literature (Celetti, 1999; Nugent, 2001; Snowden, 2003) including teacher self-doubt of the ability to teach inclusion students. Lack of training in student learning styles and doubting the students' ability to learn (Celetti, 1999) also surfaced. A tentative presumption was formed by the researcher, similar to the schematic in Figure 2: students can learn regardless of alternative learning styles (Gardner, 1983, 1993, 2006; Vygotsky, 1962) if teacher training is incorporated into school systems. A theory was formulated through the research study data collection procedure that is outlined in chapter 3. Coding and charting of the survey and nonsurvey data instruments is included in chapter 4, and interpreted in chapter 5.

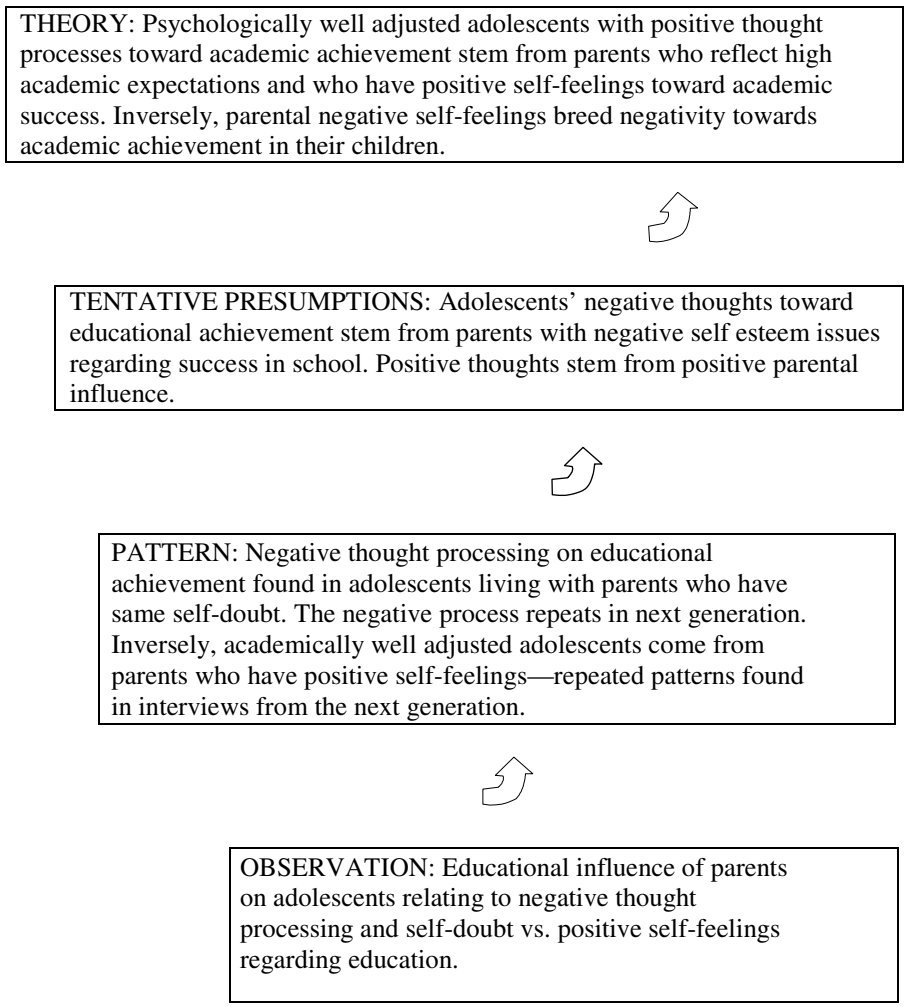


Figure 2. Inductive Schematic A of Educational Expectations and Achievements of the Kaplan, D., Kaplan, H., and Liu (2003) study, developed by the researcher, provides a guideline to follow for the study described in chapter 1 and outlined in chapter 3.

Bednar and Fisher (2003) found similar results with adolescent decision-making that is directly related to parenting styles and expectations. Parental expectations were found to cause undue stress on the children in families when there is a child identified with a disability. The highest at risk for decline in academic achievement were identified

as youth who do or do not feel connected to school. Unfortunately, the development of school-based prevention strategies did not include teacher training.

Aydin and Oztutuncu (2001) conducted a case study connecting where the adolescent lives with issues of adolescent depression, negativity, and the environment. An adverse affect occurs when an environment in which the adolescent lives is discovered to be unhealthy, physically or emotionally. If the family life is found to be dysfunctional, the result for the adolescent may lead to depression and negative thought processing. When a teacher confronts a student with negative thought processing, more commonly referred to as an *attitude* problem (Essau, 2004; Levine, 1995), discipline problems erupt. The result is more negativity in the life of the student. Attempting to function with an underlying problem of depression hampers student academic ability, rarely leading to a successful school career. An examination of the family environment is a logical starting point in solving problems of academic successes or failures.

Three tests were given to 311 high school students, 133 males and 178 females, from public and private schools (Aydin & Oztutuncu, 2001). The students volunteered after receiving an explanation of the tests and methods in which the study would take place. Permission to test was obtained from the classroom teachers and the school administrators. The test results were reported statistically, using standard deviation and mean scores to report the findings. Details as to whether the scaling was done through an Equal-Appearing Interval Scale, Likert or Summative Scale, or Guttman or Cumulative Scale were not clear.

As a result of the study, it was discovered that the cohesiveness of the family structure directly affects the adolescent developmental period. Families with close ties rely on each other, share problems and successes that lead to positive social and emotional adjustment. Inversely, families that lack togetherness tend to develop problems with adolescents dealing with depression and negative thought processing. Although the results produced informative data, both positive and negative according to the family cohesiveness, further study is needed. An explanation for the negative data lacked details. No suggestions were made as to how the family could improve to prevent depression in adolescents.

Similarly, the positive results were not outlined with explanations so a replication of the study would be difficult. The data set consisted of only volunteers, limiting the assertions that can be drawn from the results. Three different test results were triangulated, but no additional interviews, observations, or documentations were recorded. The case study approach for the phenomenon, although appropriate, lacked in multiple sources of information. Another possible source of information, to collect data from the family members of the volunteer students, would allow for a cross-case analysis.

The collective case study described in chapter 1 and outlined in chapter 3 with methodology for examining the academic success of inclusion students in the mainstream environment when the teachers have and have not had individual differences training followed a cross-case analysis (Johnson & Christensen, 2003), as suggested from the Aydin and Oztutuncu (2001) study. Added depth for the study included multiple data collection sources, to ensure that replication is possible.

The Aydin and Oztutuncu (2001) case study indicates that family life and environment directly affect adolescent development of healthy thought processing skills. In working with adolescents within a school environment, if depression and negativity are present, an area for exploration to better promote scholarly success may be the family. A negative focus can be shifted to a positive focus for families and schools alike. Improving the scholarly focus within the school community by addressing the family environment reduces the discipline issues and improves the campus environment for the majority of students.

The ability to learn is directly affected by the environment in and out of school. Current research studies related to the learning, the brain, and the neurotransmitter serotonin is included in the next section. Studies that examine the serotonin aspect of the ability to learn are new and should be carefully considered as experimental.

Student Focus: Brain Research

Research about learning has emerged in cognitive science through recent studies (Askenazy, 2000; Gardner, 1983, 1993, 2006; Lavoie, 1989, 2005; Levine, 1995; Masters & McGuire, 1994), but schools have not translated the information to teacher training programs or curricula (Gardner, 1983, 1993, 2006; Senge et al., 2000). Effective student learning is blocked because teachers and policy makers do not fully understand how learning occurs. The functions of the brain are complicated and difficult for the layman to comprehend, but a basic understanding is necessary. Current research and discoveries in brain functions may improve classroom behavior which in turn can substantially improve academic classroom performance.

Teachers faced with adolescent impulsivity in a high school classroom often do not understand what occurs, responding back to an impulsive student outburst with an impulsive teacher outburst. A book written by Masters and McGuire (1994) offers insight with detailed information explaining that there may be as many as one hundred different chemicals that act as neurotransmitters in the nervous system. The neurotransmitter revolution studies of Masters and McGuire (1994) focus on serotonin and social behavior. Teacher training programs in regards to the behavior of adolescents may offer suggestions for improved classroom policy.

Serotonin, a chemical found in the brain called a neurotransmitter, affects impulsivity when the serotonin levels are too low. When signals are sent between the nerve cells there is a gap called a synapse that depends on serotonin to transmit the messages. Levels of serotonin are affected by internal and external environment, diet, age, maturity, and stimuli from a variety of sources.

Much like human genes, there are vast differences in serotonin levels and the effects that serotonin has on the balance of the whole human body, not just on the brain. If there is not enough serotonin in the brain, then impulsivity can spin out of control. Guidance, training, and a better understanding of impulsivity indicate that channeling student energy into hands-on interactive learning experiences can be done naturally without drug intervention. The need for teacher training to better understand the relationship between impulsivity and brain activity substantiates the study. Serotonin studies are related to studies of the central nervous system. Human behavior, specifically impulsive decision-making in adolescents and the study of serotonin are not yet

conclusive, but continue to provide information worthy of further study.

If adolescent impulsivity blocks the social development of comprehension and the decision-making process, inside or outside of the school environment, then the capacity to solve problems is interrupted. Figure 3 displays how the connection of the central nervous system is related to the internal and external environment.

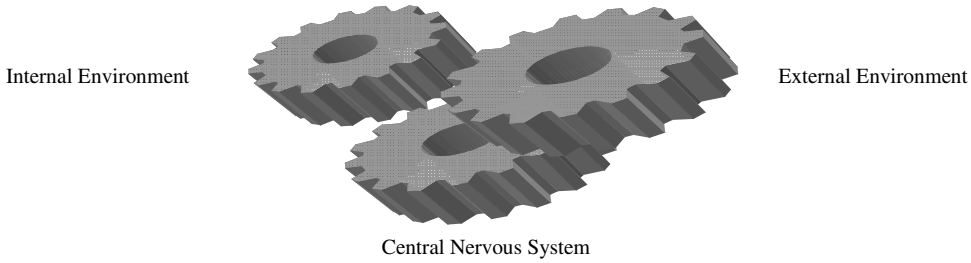


Figure 3. The central nervous system is directly affected by, and directly affects internal and external environment.

The explosion of discoveries linking the biological functions of the brain to how the effects of the discoveries are influencing human development changes more rapidly than can be comprehended. As social scientists strive for a deeper understanding of the ever-changing environment, risks must be taken to develop schema on which to attach new phenomenon.

Despite early studies revealing that chemical neurotransmitters could possibly cause nerve impulses, a heated debate between physiologists and pharmacologists called the *War of the Soups and the Sparks* extended over two decades (Valenstein, 2005). Historically, controversy at the turn of the 20th century blocked progress in the discovery and function of neurotransmitters, until now. At the turn of the 21st century the study of

neurotransmitters has again reached the laboratories of scientists. The results of the action between the cells are a possible explanation for adolescent impulsivity.

In 1960 serotonin, considered another interesting chemical substance found in the brain, was not accepted as a neurotransmitters according to a book written by Valenstein (2005), but had a role in brain function. Along with two studies of emotions that affect impulsive behavior and self-esteem (Dreher, 2003; Fessler, 2001), suggestions infer that the role of the neurotransmission of serotonin is a key factor in self-esteem. Teachers doubting the ability to teach impulsive inclusion students project a negative atmosphere. The environment is negatively affected, and students seeking positive approval are adversely affected, which can lower the desire to achieve.

Approval-seeking behavior is part of the environment in which humans evolve and that kind of behavior fosters risk taking, according to Fessler (2001). An ethnographic study was conducted by the author to determine the degree of the role of emotions in the scheme of risk taking behavior. Is it worth the risk, and at what cost? Emotions are never wrong, but what is done with emotions can influence the outcome of an event, ultimately affecting self-esteem. The study found that with strong self-esteem the emotions of shame and pride are less frequently influential in the decision-making process. Less risk taking behavior translates in a classroom to a better and stronger focus on academics. There is a need for training classroom teachers to recognize approval-seeking behavior as Fessler (2001) describes in the ethnographic study. Connecting approval-seeking behavior to the serotonin studies will strengthen teacher awareness. An

altered environment exists is a mainstream classroom when students with alternate learning styles are included and requires training.

Further development of the study on neurotransmitters, specifically serotonin, indicates how adolescent impulsivity and decision-making are affected by the relationship between serotonin and synapse function (Masters & McGuire, 1994; Valenstein, 2005). A psychological theory emerged in 1983 combining two studies, one which explored the cognitive development of healthy and gifted children, and the other which studied the breakdown of cognitive brain functions in adults (Gardner, 1993). Gardner supported neurobiological research indicating from his research that learning is an outcome of the modifications in the synaptic connections between the cells. Various types of learning results in synaptic connections in different areas of the brain according to the studies that led Gardner to espouse the theory of multiple intelligences (1983). The interesting chemical substance found in the brain in 1960 called serotonin has since found a relationship with neurotransmission, synapse connection, self-esteem, and adolescent impulsivity and decision-making.

In another related study, inactivity in the brain was examined (Askenazy, 2000) and associated with attention, concentration, planning, and organization directly related to decision-making skills and impulsive reactions. Neurotransmitters that lack the ability to send complete chemical messages across synapses indicate less activity in the brain. Mean platelet serotonin concentration was positively correlated with the intensity of impulsivity in the study conducted by Askenazy (2000) with a group of adolescents. The study provided observations conducted in a psychiatric facility where adolescents were

admitted for at risk behavior. Replication for the study in a natural school setting would be weak due to the setting in the study at a psychiatric facility.

The Masters and McGuire studies (1994) provide more reliable data as the duration of the data collection took place over a period of several years with multiple sources of data to substantiate the findings. The study concluded that the neurotransmission of serotonin and genes share commonalities. Each varies from one human being to another for many reasons, including diet, life experiences, and social status. Genes were found in the study to influence neurochemistry. The effects of behavior, culture, and the social environment were found to be influential factors as well. Serotonin studies continue to develop new theories that relate to impulsivity and the decision-making process of adolescence. Unless steps are taken to insure that teacher training is incorporated into new knowledge for current pedagogical practices, serotonin study results will remain a mystery to classroom teachers.

Understanding the negative results of serotonin studies when contemporary neuroscientists studied and discovered how we perceive, feel, and think, is important for a balanced view of the subject. Recent discoveries attest to human abilities to control outcomes with varying results, as a study (Retz, Retz-Junginger, Rosler, Supprian, & Thome, 2004) relating serotonin function and impulsivity reveals. The study revealed evidence that disturbances in central serotonin (5-HT) function have a role in impulsive aggression.

Another study (Kish, 2000) indicates that drug abuse from the dance drug ecstasy lowers the brain's supply of serotonin, a neurotransmitter linked to mood swings. Ecstasy

is thought to produce euphoria by releasing a rush of serotonin, but the brain has trouble replenishing the supply, according to Kish (2000). Human behavior, specifically impulsive decision-making in adolescents and the study of serotonin are not yet conclusive, but continue to provide information in need of further study.

Student Focus: Learning Styles

There is a link of the neurotransmitter serotonin in brain research to the synapse functions in the brain. The discovery of the theory of multiple intelligences in 1983 by Gardner reveals the link and the historical and philosophical development connected to the research study. Years of duplication and replication to the research conducted by Gardner (1983, 1993, 2006) attests to reliability and validity of the findings leading to the discovery of the theory of multiple intelligences, as seen in the diagram in Figure 4.

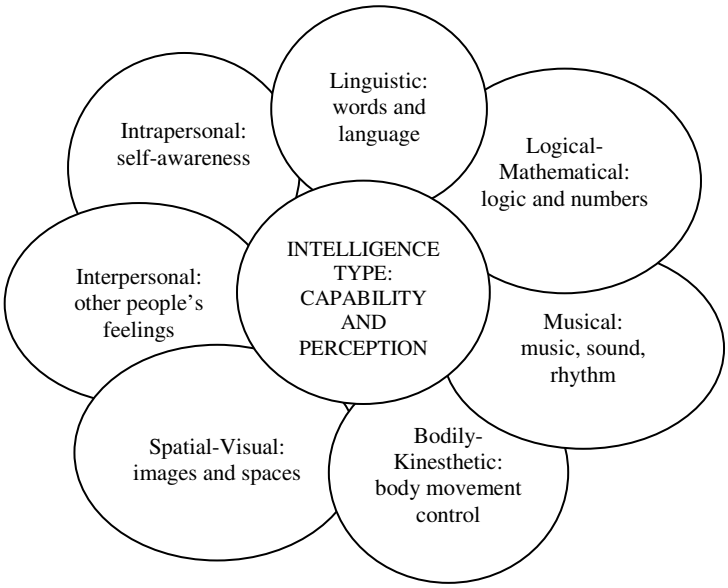


Figure 4. Gardner's (1983) Theory of Multiple Intelligences links to serotonin.

Howard Gardner (1983) developed a love of the social sciences at Harvard University, acquiring knowledge from every aspect of academia not limited to any one particular field of study. Gardner was asked to narrow the focus of his study. A psychological theory emerged combining two studies, one that explored the cognitive development of healthy and gifted children, and the other examined the breakdown of cognitive brain functions in adults (Gardner, 1983). The theory took on meanings in areas serendipitous to Gardner, as the intention was not originally thought to be applicable to the field of education.

Through research that began in 1979 for the Project on Human Potential, Gardner (1983), focused his study of intelligence "on two assumptions: first, that it is better described in terms of a set of abilities, talents, or mental skills and that, however defined, it cannot be measured by standardized verbal instruments, such as short answer, paper and pencil tests" (Gardner, 1993, p. 15). Inspired by the work of the Soviet psychologist Lev Vygotsky (1962) who espoused the Zone of Proximal Development theory that relates learning to differences among the practices in cultures (Cheyne, 1999), Gardner recognized that various cultural experiences enhance the growing child. Working under the umbrella of a well funded, extensive project with teams of consultants in Egypt, India, Japan, Mexico, the People's Republic of China, and West Africa, the 5-year period of the project provided a plethora of cultural backgrounds for reference.

The Cheyne study (1999) relating the Gardner and Vygotsky theories compared the concepts of Mikhail Bakhtin and Lev Vygotsky regarding the characteristics of speech and thought. The author considered a broader scope for Vygotsky's zone of

proximal development (1962) as it relates to individual socialization and cultural and historical change. Using examples from literature and history Cheyne quotes Tolstoy, relating scaffolding instruction, originated by Bruner in the 1970s, to Vygotsky's Zone of Proximal Development as an explanation of how the Zone of Proximal Development can be understood and used to further learning experiences.

Well documented with an extensive reference list, the journal article by Cheyne (1999) offers suggestions that may affect social change in ways that educators may better perceive learner capabilities. Classical theory is used by Cheyne to understand the contemporary needs of the levels of learners within the mainstream environment with a compare and contrast format. Empirical evidence is cited for easy reference. Technical psychological language and inferences require repetitive readings for a clearer understanding of the concepts, but are well worth the time invested. Different dialogues are defined and perceived from a psychological point of view that may not be easily understood from a mainstream perspective, leaving the concepts open for criticism. Social change and taking risks emerge together with new discoveries as seen in the discoveries of the new millennium. Social scientists continue conducting research for the betterment of society.

Technological advances suggesting a paradigm shift for the new millennium requiring workers to be self-starters with abilities to think independently faces educators (Calvert, Conger, & Murray, 2004; Guskey, 1996). Dynamic ideas are needed to prepare learners for the individual socialization, cultural, and historical changes ahead. The Cheyne (1999) study suggests methods in speech and thought processing, internal and

external, as alternatives to meet 21st century demands. The alternate methods support the need for the study as the demands of the new millennium require independent self-starters. Are teachers prepared to meet the needs of the demands of the 21st century if alternate learning styles are not clearly understood? Students can learn, and teachers deserve to be trained to understand the various levels of learning.

The rationale that the majority of students can learn, albeit in an alternate learning style stems from the multiple intelligences theory (Gardner, 1983, 1993, 2006). The research study substantiates a need for further study. There was no direct educational implication in Gardner's psychological theory in 1983, but the implication for social change was imminent. Educational systems currently focus on learners who use only two intelligences, linguistic and logical (Gardner, 1993; Senge, 2000). The multiple intelligences theory incorporates several types of learning styles, instilling a cry for a more balanced system of instruction that could benefit most types of learners.

The possible impact on education is huge, providing the multiple intelligences theory is accepted. The didactical system of teaching previously accepted as the only approach in educational institutions could virtually be changed forever. For example, studies incorporating thought recognition (Kelley & Stack, 2000) and hands-on curriculum (O'Neal, 2004) into teacher training offer examples and new approaches to teaching Algebra (Thornton, 2001). Terms such as learning styles, alternate learning styles, individual differences, and modes of learning are used interchangeably in the scholarly literature in reference to learning (History of Drake Institute, 2001; Askenazy, Benoit, Lecrubier, Lestideau, & Myquel, 2002; Carbone, 2003; Dreher, 2003; DuPaul,

1997; Gardner, 1983, 1993, 2006; Levine, 1995; Senge, 2000; Swinderek, 1997). The idea that differences exist in human beings, and the need to recognize the differences in the ways that learning transpires, is an urgent need in learning organizations.

The research study examined the effects of teacher training on the academic performance of inclusion students mainstreamed into regular education classrooms as introduced in chapter 1 and carefully outlined in chapter 3. The research was based on the theory that the majority of students can learn, albeit in an alternate learning style. The formulation of multiple intelligence as linguistic, logical, spatial, bodily kinesthetic, musical, interpersonal, and intrapersonal strengths presents a more balanced holistic view of human characteristics (Gardner, 1983, 1993, 2006) and was used with Vygotsky's (1962) zone of proximal development as the theoretical bases for the study.

Other studies stemming from Gardner's research are plentiful in the literature. One example is from Nguyen's (2002) study conducting research examining multiple intelligences curriculum effects on student performance. Multiple intelligences teaching methodology was incorporated across the curriculum in the longitudinal study with a sample size of only 32 participants, weakening the validity of the results. Statistical analysis revealed that the null hypothesis was correct. The test results of the students with the multiple intelligences methodology incorporated into the curriculum were not any higher than the student test results without the multiple intelligences methodology. The study revealed that the null hypothesis was correct, indicating that the use of multiple intelligences methodology across the curriculum was as effective as without.

The sample size for the research study was small, as in the Nguyen (2002) study, but multiple data collection instruments to substantiate the reliability of the study is carefully outlined in chapter 3, described in chapter 4, and interpreted in chapter 5 to support the data results presented. The collection, organization, and examination of the data results are useful to administrators, curriculum specialists, resource specialists, teachers, and parents. Details as to how teacher training affects the academic performance of the inclusion population of learners in regular mainstream classes is provided. School systems will find the research results useful by examining how the relationship between students, the schools, and the teachers are more harmoniously balanced. The refocus of academic performance to include the majority of the levels of students should be a primary consideration, despite outside influences from standard based testing, multiple legislation, and family dysfunction.

School Focus: Political Influence

Education is a microcosm of the larger society as a whole (Kilpatrick, 1992). The reality that decisions must be made politically, socially, and economically cannot escape members of organizations in education, or anywhere in society. Strong foundations are needed on which to base decisions, but often leadership in education comes from outside sources that do not relate to the needs of the students, the clients of the school system (Sroufe & Wurtz, 2003).

In Western society, politicians have the power to dictate what types of teaching and learning occur in school systems (Hunkins & Ornstein, 1998; United Nations Educational, Scientific and Cultural Organization [UNESCO], 1996). The shaping forces

of schools and educational organizations are controlled by political prowess driven by societal demands. Sroufe and Wurtz (2003) conducted a comparison study on old and new legislation. Interestingly, the results found a direct relationship to the White House and not to school organizational needs or students. Government appointed positions are created to support political agendas. Unfortunately, politicians are not educators, more directly: politicians are well trained, but not necessarily well educated, leaving the fate of the social system of education in the wrong hands (Gardner, 1991; Kilpatrick, 1992).

Decisions that must be made politically, socially, and economically sometimes force educators to work backwards out of a chaotic system created by politicians uncommitted to the heart of the problems in teaching and learning. When budgets are cut and programs eliminated educators take what is offered by politically driven revenue to make the subsystems work. Often counter productive to the whole school system, changes in legislation make more demands on the regular education curriculum. As regular education legislation increases demands on teachers, the needs of the inclusion students are ignored, causing the systems of support for the majority of the levels of learners to breakdown (Gardner, 1993; Senge, 1990). The academic achievement of the inclusion students in the mainstream environment are at risk in need of trained teachers to understand that the majority of students can learn.

School Focus: Systems Breakdown

If society is to progress positively into the 21st century for the betterment of humankind, then support systems must meet the challenges through research and social change. Social change demands that challenge and support systems question past trends.

Human development continues to improve with the education, research, and understanding of new theories as they appear, but school systems continue to operate on a linear plane. Students need nonlinear solutions, resulting in a gradual breakdown of the system (Gardner, 2000; Senge, 2000). Classroom environments are highly variable aspects of dynamic, nonlinear systems which mean that linear curriculum is a mismatch for what is needed in the teaching and learning system for students to succeed (Bui, Deshler, Schumaker, & Vernon, 2000).

Longitudinal studies looking at reasons for school disconnectedness (Bolland, 2001; Bonny, Britto, Hornung, Klostermann, & Slap, 2000) examined target populations for school based intervention programs. Statistics for the highest at risk for health issues were lacking, leading to needs for further study. Seven out of 12 variables associated with school connectedness entered the regression model, and six were significant: race, extracurricular involvement, cigarette use, health status, school nurse visits, and school area. Gender was not significant. Identifying factors that relate to youth who do or do not feel connected to school leads into the development of school based prevention strategies for the highest at risk for behavioral and health issues.

The cross sectional survey of self-reported data does not include direct measures of behavior, an explicit bias, but suggests that connectedness is malleable. Mention of a well documented recent study reported that interventions had positive effects of school bonding when interventions are started early in the school career (Wood, 1997). A detailed reference list is provided to aid in the validity and reliability of the data from the

Bonny, Britto, Hornung, Klostermann, and Slap (2000) study, giving support to the study that includes a detailed reference list following chapter 5.

Another study conducted by Bui, Deshler, Schumaker, and Vernon (2000) directly relates to the study reflecting a breakdown in the school system. Despite myriad laws to support special education, factors within the school environment prevent learning from taking place. Standards based education was enacted at the same time special education students were mainstreamed into the regular education classrooms in the 1980s. Confusion as to the role of the special educators has devalued, creating a new role as a paper pusher support person who sits in the back of a general education classroom as an instructional assistant. General education course requirements have become more stringent to meet standards based testing, with textbook levels up to 17th grade reading in some government courses required for graduation. Students with disabilities can learn, but the training for teachers is nonexistent to meet the needs of the majority of learners. A breakdown occurs when inadequate teaching strategies continue to be used.

The authors Bui, Deshler, Schumaker, and Vernon (2000) cross-reference the data from an extensive five page list of references, validating that the report represents accurate and current information. The reliability of the data can be checked and researched further through the citations. The format is an analytical reporting of the status of the high school general education classroom and how students with disabilities struggle within the confines of the current environment. A direct relationship to the study of inclusion student academic success parallels the Bui, Deshler, Schumaker, and Vernon

(2000) study introduced in chapter 1, outlined in chapter 3, described in chapter 4, and interpreted in chapter 5.

The value of the study results is immeasurable. The picture of the current status of high school education is dismal and unreachable for the students with disabilities due to legislation outside of special education. The legislation in favor of students with disabilities is in place. Unfortunately, due to mandates for more testing, state standards, and more rigorous goals for regular education, unrealistic expectations for special education students exist. The students with disabilities are programmed to study in the mainstream environment, but the teachers are not trained (Kneeler & Tarver, 1977).

The relationship of the study to the Bui, Deshler, Schumaker, and Vernon (2000) research indicated that an urgent need for further examination into teacher training existed. Cross-referencing was utilized in the data organization, examination, and coding process of the study, using a modified version of the Chenail Qualitative Matrix (Cole, 1994). As possible themes emerged in the study the results paralleled the study by Bui, Deshler, Schumaker, and Vernon (2000). A lack of teacher training programs, increased standardized testing, and a lack of consideration for alternate learning styles was discovered. Demands of unrealistic expectations of the inclusion students from the special education program were discovered in the Bui, Deshler, Schumaker, and Vernon (2000) study.

School Focus: Conflicting Legislation

Coping with the myriad of differences that tend to influence a regular education classroom when inclusion students are mainstreamed can overwhelm veteran teachers

(Celletti, 1999; DuPaul, 1997; Schlozmans, 2003), but can be especially trying for educators unaccustomed to the professional practices required in teaching. Not only do differences exit within the classroom, but also differences in the legislation often clash. Students are left at the mercy of a political platform with a budget large enough to enact money driven agendas. A gap exists in the legislation to support teacher training programs in need of recognizing individual differences. The study results reflect that a need for teacher training is urgent to support the academic success of the various levels of learners. Generating an interest in training teachers gets lost in current conflicting legislation and more social scientific research is needed to raise awareness.

The central issue presented by the author, Wenning (2005), is a study examining assessment and accountability in conjunction with fairness. The peer reviewed journal article looks at No Child Left Behind (NCLB) legislation. The enacted legislation brought federal expectations of universal proficiency, but the fairness of NCLB is a hot debate in and out of the courtrooms. Educators cannot control that snapshot test scores are used annually to measure the effectiveness of schools under NCLB legislation. Students come and go within districts and NCLB provides nothing for the flux (Wenning, 2005). Teachers want and need a measure of productivity that is fair, that follows individual student progress, and can be used for accountability. The measurement of proficiency for growth set to standards can be evaluated with longitudinal growth models, according to the study conducted by Wenning (2005).

There are no references listed with the information provided by Wenning (2005) in regards to growth models. What is mentioned within the article can lead to additional

cross-referencing to validate the claims. Pro and con information is stated so that a balanced view can be gleaned from the report. The need for expert scrutiny is also suggested to meet the needs of what proficiency really means from the vastly different bars states have set. Without a set standard, the unfairness of the legislation reaches across state lines. The classroom teacher is left to sort out the levels of the learners, and asked to proceed with a balance to the curriculum, despite a lack of uniformity to the process. The process for teachers can be simplified with teacher training programs.

The report by Wenning (2005) addresses an urgent need in education regarding the practice of using an annual test score that is not a fair measure of school effectiveness. The suggestion for using growth models to track the individual progress of students regardless of the very different starting point levels can be invaluable to teachers, parents, and administrators. Where students need to improve can easily be addressed and what resources are needed to meet the needs can generate from a growth model report. Measuring growth against goals for proficiency for each individual student provides a picture for everyone involved with the students within the many systems of the school. Teachers, counselors, coaches, special educators, counselors, and administrators can benefit from the Wenning (2005) study results.

Another piece of legislation in regards to No Child Left Behind was the focus of the Kim and Sunderman study (2004). The federally mandated policy for schools, No Child Left Behind (NCLB) enacted in 2002, demands feedback to evaluate the success or failure of the program. Study developments often answer the call for feedback, but may not be the answer the bureaucrats wished to hear. The study was conducted to evaluate

the follow up phase of NCLB, supplemental educational services for students not meeting defined learning goals. A nationwide survey by Kim and Sunderman (2004) concluded that a flawed system exists due to myriad paper trail requirements, lack of funds, and a poor response from the target population of students intended to reap the benefits of the services. The study provided an extensive reference list with ample citing throughout the documentation that substantiates the findings. Fairness in the collection of data and reports gives credibility to the results, making it believable and reliable to use for future resources in regards to NCLB.

Organizations interested in establishing a supplemental educational services plan as prescribed by the NCLB guidelines will find the information useful. School districts in collaboration with outside community resources will find pros and cons to the supplemental educational service systems used across the nation, with a focus on the local monetary impact. Insufficient funding led the complaints, so that aspect will assist future program developers. Lack of connectedness between the service providers and the classroom teachers, another flaw, will need to be improved so that a successful system can be established. Supplemental educational services for students is not meeting defined learning goals.

While the legislation appears to be useful as a supplemental source to support learners in need, the program flaws conflict. The lack of funds and disconnectedness with the classroom teachers leave the students without support (Kim & Sunderman, 2004). The classroom teacher is the link to supplemental programs, and without a connection between the students, the supplemental program, and the classroom teacher, conflicts

arise. The academic success of the students without support stems from legislation that is improperly funded. Teachers are bombarded with conflicting legislation, which changes as political platforms change, leaving the students and teachers without support for the programs that will initiate the most benefit to the majority of the levels of learners.

Another example of conflicting legislation comes from a study regarding how the scoring of tests is interpreted. Rules must be followed when interpreting test scores, according to the author, Echternacht (1989). Objective measures are necessary in choosing students for compensatory programs. Supplemental educational programs although under funded are an important part of school systems, so careful placement into the programs is necessary. Multiple measures of testing give a more accurate account of student progress. If standardized scores are the only acceptable means of evaluation, then using a sequence of assessments is recommended. Study teams used to evaluate student progress can use standardized scores if an understanding of how to interpret the scoring process has been taught. Definitions for out of level testing, grade level testing, and degree of error are listed in the article. Few administrators properly interpret the degree of error in individual and group test scores.

The article has no reference list, no citing within the reported information, and under the name of the author is listed Educational Testing Services. Hidden biases indicate that more testing is recommended because the author is affiliated with the testing services company. Doubt is raised as to the validity of the reported information. The definitions can be validated through dictionary cross-referencing, thus adding credibility

to the information presented. Definitions used in the study proved to be a necessary addition.

Educators at every level from administrators to classrooms teachers need valid and reliable information regarding standardized testing. Mandatory testing has become a staple in education, and an accurate understanding of the testing process should be a requirement of teacher preparation. The study reports information clarifying terms used in testing that may be helpful to anyone reading or interpreting the scores. The study also offers insight into how scores can be interpreted in ways that are not a fair evaluation. If scoring is misunderstood then a balance in the process of testing is not achieved. Teacher training programs are in demand in areas other than individual differences training, such as the need for interpreting test scores. Conflicts occur when legislation is enacted without follow through to support valid and reliable information (Echternacht, 1989).

Teacher Focus: Resistance to Change

Resistance to change in any system or organization exists, and is an extremely sensitive issue in education due partly to "the ranks of the faculty . . . loaded with tenured individuals who have scant incentive to change their attitudes or behaviors" (Gardner, 2004, p. 94). Without change, school systems will continue to get in the way of education. The process of the system in education reflects the "kind of society into which we evolve" (Hunkins & Orenstein, 1998). Conflicts exist between the process of systems in education and an evolving society in need of strong leadership.

Strength gained through the struggles that educators endure has produced an educational monopoly within the school systems formed as "an impressive institutional

infrastructure that links to a firmly established network of interests. Teachers constitute the 'largest single group of trained professionals in the world'" (UNESCO, 1996, p. 1). Educators forced to fend off crisis after crisis within the existing chaotic system of educational reform have become a major facilitating factor (Hunkins & Ornstein, 1998), often producing a positive outcome from a negative situation.

Unfortunately, a negative outcome has surfaced out of the chaos of reform and is leading a force of educators against change. Any alternative to the mainstream delivery of educational practices, the teacher-lecture-textbook-standardized test modality, has to "fight a hard battle to achieve even a minimum of recognition" (UNESCO, 1996, p. 1). Loyalties lie within the subsystems, so change is avoided, and resistance to change generates negativity in organizations (Bertalanffy, 1967; Capra, 1996; Gardner, 1993; Senge, 1990). Resistance to change, when there is not a shared vision for reform is described by Senge (1990) as a response by the system trying to maintain balance where balance seems to be nonexistence.

In direct correlation to the study, teachers do not like change, but change is inevitable in a society that thrives on progress (Reilly, 1997). The revised Individuals with Disabilities Education Improvement Act of 2004 (IDEA) (2004) mandates the inclusion law. The least restrictive environment clause is listed on the special education student Individualized Educational Program (IEP), and continues within academia to alter the regular mainstream education environment (Cauley, Linder, & McMillan, 2001). The change of inclusion locations for students in special education has been taking place for four decades, along with the continuous resistance to change.

Laws to mainstream students are not new. The resistance to the mainstreaming laws is not new. Without raising awareness, teachers are left in classroom with learners that are perceived to be difficult to teach because the learning abilities are new to educators, but not new to learning (Gardner, 1983, 1993, 2006). With training to recognize alternate learning styles, the resistance to change may diminish. The following study reveals information of alternate forms of testing, not new, but also not easily understood, thus resisted.

Education reform is a struggle facing schools in the United States, and a national test will only inhibit student growth, "a cart of testing placed before the horse of educational reform" (Davey & Neill, 1991, p. 2). The authors report on testimony to the House subcommittee on Select Education that indicates harmful effects from national testing will impact low income and minority group children. The report was given 15 years ago. An alternative plan to national testing from the National Goals Panel and the National Council on Educational Standards and Testing suggests performance assessment. The standardized exam driven efforts for school reform in the 1980s failed, thus substantiating the outcry against another national testing mandate.

Explicit biases include false claims by proponents of a national test stating that other nations have national tests or exit exams similar to what is proposed for the United States (Davey & Neill, 1991). Significant references are included to back the authors' claims against national testing that validates the report, giving it reliability for future use in citing the sources. Educators, parents, teachers, and anyone interested in education reform will profit from the information in the report. Communities with low income and

minority groups of children will be especially interested in the arguments against national testing. Another serendipitous group to be impacted by the values of the article is the special education community of teachers and learners. Reports in 2006 continue to appear in court cases that fulfill the prophecy of the Davey and Neill (1991) study: national standardized testing is not a fair assessment of evaluation for the majority of learners.

More hands-on interactive curriculum that can be evaluated through performance-based assessment directly affects learners outside of the logical and linguistic realm of teaching (Gardner, 2006). The Davey and Neill report suggests proposals regarding performance-based assessments are in existence for consideration. Specific groups are currently designing model exams for states and districts to adopt. More individual goals are needed to relate to the needs of learners in the mainstream classrooms.

The resistance to change is paralleled in the standardized testing debate taken from the Davey and Neill study (1991), completed and reported 15 years ago, by indicating that the same argument is a current topic debated today. Teachers resist change, legislators resist change, but without change our future leaders, the students in the classrooms in need of 21st century accommodations will not be prepared to face the world outside of education. Life is not a standardized test, but a hands-on interactive process. An urgency to reach and teach the majority of learners exists, and by teaching the teachers to balance levels of learning the resistance to change may give way to accommodations.

Teacher Focus: Self Doubts and Student Doubts

Two studies independent of each other found that much of education reform reflects a belief that teachers are not competent professionals (Bui, Deshler, Schumaker, & Vernon, 2000; Cronin, Houser, Houser, Kingsbury, & Olson, 2003). Experts of one sort or another are making decisions about *what* should be taught and *how* it should be taught. The national standards movement, state and national curricula, performance based teacher pay, and national testing are current expressions of legislative mandates taking away from how teachers teach (Davey & Neill, 1991). The impact felt by teachers and students influences the entire system of education, as indicated in a study by Perkins-Gough (2005). Systems theories developed by Gardner (1999) and Senge (1990) indicate that there are no universal solutions and no national standards that can be meaningfully adopted for all children in all school systems. Research reveals that there are no national tests that can measure all the important goals of schooling, and no objective, standardized way of comparing teachers (Bui, Deshler, Schumaker, & Vernon, 2000; Cronin, Houser, Houser, Kingsbury, & Olson, 2003; Davey & Neill, 1991), yet national legislation continues to mandate policies for more accountability through standardized testing.

Teachers begin to doubt the ability to teach with the negativity that surrounds the demands for more standards based testing (Celetti, 1999; Nguyen, 2003; Snowden, 2003). The impact of testing demands decreases the effectiveness of teacher experience. The increase in social, legal, political, and economic systems in educational institutions making demands of educators is filtering down to the students. National, state, and local demands made on teachers to test and retest in order to meet current legislation consumes

the time required for trial and error processes. Trial and error processing skills are necessary for schema building in teaching and learning. The lag time between stimulus and response requires more time than is available due to current legislative requirements for immediate response answers. The time needed for reflection to convert learning to knowledge (Gardner, 1999; Senge, 1990) is gone out of the classroom, replaced by drill and practice to prepare for multiple choice short answer standardized tests.

Crises in education are developing, forcing quick responses from students for standardized answers. The result is a limited relevant knowledge base that is partly responsible for the failure of students to meet the goals set by national NCLB legislation and state testing requirements (Bui, Deshler, Schumaker, & Vernon, 2000; Cronin, Houser, Houser, Kingsbury, & Olson, 2003; Perkins-Gough, 2005). School systems are desperate, teachers are desperate, and students are failing to meet criteria to graduate from high school.

Teacher Focus: Changing Roles

A shift in the basic philosophy of school systems from the rote memorization of individual fragmented facts of knowledge to a system that views knowledge with a broad scope of teaching for understanding is needed (Gardner, 1999). Unfortunately, according to a study conducted by Darling (2000), adults are not always available in an environment where the opportunity to seek and impart advice is most needed for teaching for understanding. Students and teachers are not readily connected on campuses in the United States.

Conditions inside and outside of the United States were studied by Darling (2000), looking at American, German, and Japanese adolescent relationships with adults outside of the family. The assumption that American students form close relationship with teachers, seeking adult guidance was disproved. Serendipitous results indicate that the Japanese student/teacher relationships were the closest of the three countries (Darling, 2000). The collected results show that in Japan students are more responsible for their own learning, whereas in the United States the responsibility of learning falls upon the teacher and not the student. The German adolescent relationships outside of family come from after school community clubs for sports and music outside of school, similarly found in Japan.

In the United States, sports and music are embedded into the school curriculum. The overcrowded classroom crisis in American schools does not foster close personal relationships between students and teachers. Without the opportunity to build relationships with teachers, adolescents in the United States rely more on family members or peers for guidance and direction to sort through periods of confusion and duress. If teachers exude a genuine care and concern for their students, then the results speak volumes for the adolescent seeking guidance (Darling, 2000). Adolescents need adult guidance outside of the curriculum from teachers, but without the availability to build close personal relationships, unnecessary impulsive risks are taken (Dobson, 1982).

A study (Essau, 2004) was conducted to examine the behavior of German youths in relation to risk taking, risk perception, and personality. Frequency of risk taking was the study focus, and the results produced an inverse relationship between risk taking

behavior and risk perception. If the perception of the risk is clouded for any reason and not considered to be too great, then the behavior tends to be riskier, leading to possible adverse consequences, according to Essau (2004). The data collection for German adolescent behavior is important for global comparisons and future research. The study indicates that not only one nation is at risk with the behavior of the youth, but also globally adolescents in general are taking unnecessary risks. The Darling (2000) and Essau (2004) studies help to illustrate the need for future studies and programs that instruct adolescents in the areas of risk perception and risk taking in relationship to the control of impulsivity. Would impulsive students taught by teachers with training benefit?

High school is the last stage of formal education before the experience of the real world challenges many students. Not all students attend college. What students face in the real world, outside the sheltered walls of school life does not appear on an IQ test. Educators need to rise to the challenge of preparing for the 21st century by bridging the gap between school, the community, and the real world outside of school by abandoning past practices for new innovative teaching. It takes courage to compare classical theories in the five major areas of human learning. "Nature of intelligence, motivation of students, the way students learn, what students should learn, and how learning should be assessed" (Feden, 2006, p. 5) is described in a recent study. Classical theories by Vygotsky (1962) and Gardner (1993) outline human development traits, but contemporary research needs to continue to adapt to the new millennium environment and demands.

By adapting the new realities to how adolescents approach the future, youth are empowered to educate themselves beyond what is offered in classrooms. Teachers, parents, and educators must teach that impulsivity is within the normal realm of human development and that it can be managed with a deeper understanding of self. Understanding that impulsive urges are normal empowers youth to take control of future decisions, thus the teachers need to be taught so that the students can learn.

Summary

In examining the literature to discover the need to affect change in the special education community of students mainstreamed into the regular education environment, an urgent need for teacher training emerged (Celetti, 1999; Nugent, 2001; Snowden, 2003). A better understanding of the levels of learning within current classroom environments must transpire as the mainstreaming of inclusion students continues to alter the regular education curriculum at an alarming pace (Cauley, Linder & McMillan, 2001). Discovering the need for social change does not come without risks, but without teacher training to prepare educators for the changes, student academic outcomes are at risk for decline. The hidden advantage to teacher training for alternate learning styles incorporated into pedagogical practices benefits the majority of students, regardless of placement in or out of special education programs.

The research study extends the current body of knowledge regarding the mainstream population of special education inclusion students by reflecting on whether teacher training affects the academic achievement of the inclusion students. Inclusion students continue to be mainstreamed, but not enough is known about whether teacher

training has an affect on academic achievement, as the gap in the published literature reflects that a lack of teacher training exists. Previous research examines the concepts of mainstreaming (Celetti, 1999; Nugent, 2001; Snowden, 2003), the students involved in mainstreaming, the reasons behind the concepts, and the mandated legislation, but previous research does not examine teacher training effects because teacher training programs are not incorporated into current pedagogical trends.

Current pedagogical trends are in transition and school districts need to incorporate workshops, seminars, and in-service training sessions for individual learning styles to ease the transitional process. Scholarly literature indicates the transitional process for mainstreaming students has spanned two decades without a focus on teacher training (Celletti, 1999; Nguyen, 2002; Snowden, 2003). Gaps exist in the scholarly literature regarding the lack of teacher training. The study examined the uncertainty of the effects of teacher training as a predictor of inclusion student academic outcomes when the students are mainstreamed into the regular education curriculum and aids in filling the gaps in the literature.

The purpose of the quasiexperimental qualitative collective case study was to examine the relationship between teacher training and student academic performance to determine if there was a difference in the academic success of special education inclusion students when their teachers do or do not have training for individual differences. Special education inclusion students may be at a disadvantage for academic success when taught by teachers without training to recognize and incorporate individual differences into the mainstream curriculum. The specific purpose of the study is described in chapter 1 and

will be described further in chapter 3 with detailed steps of the methodology used of a qualitative tradition. A better understanding of whether teacher training and support affects the academic achievement of inclusion students simultaneously enrolled in the special education program and placed in a mainstream regular education class was discovered to fill the gaps in the current body of scholarly literature. Chapter 4 describes the results and chapter 5 interprets the data, including social change implications.

CHAPTER 3: RESEARCH METHOD

Introduction

Due to current educational trends, an increase in the enrollment of the special education inclusion population of students into the mainstream teaching environment exists. Without teacher training to prepare educators for the changes, special education student academic outcomes may be at risk for decline. Regular education classroom teachers currently face an influx of students with learning styles that create challenges to typical pedagogical practices. The least restrictive environment clause listed on the special education student Individualized Educational Program (IEP) continues within academia to alter the regular mainstream education environment (Cauley, Linder & McMillan, 2001).

Special education inclusion students have the capacity to learn, albeit sometimes with an alternate learning style. Different styles of learning are not exclusive to special education students (Gardner, 1983, 1993, 2006), thus an understanding of the concepts of alternate styles of learning will serve regular education students as well as the special education population of learners. Without teacher training to prepare educators for changes within the classroom, teachers may fear the inclusion students' style of learning (Aydin & Oztutuncu, 2001), doubting that there is an ability to learn. As a result, an acutely apparent need for teacher training to support special education inclusion student academic outcomes is at hand. An understanding of the adjustment period in switching

from working with regular education students to working with students with alternate learning styles is an urgent need in education.

The research questions, design of the study, participant selection and sampling strategy, role of the researcher, context of the study, data collection procedure, data analysis and interpretation, evidence of quality, feasibility and appropriateness, and informed consent and ethical concerns are included in the following sections of chapter 3. A detailed explanation of how a qualitative approach is appropriate to the research study follows in each section. The fully developed design justifies the specific chosen tradition of inquiry. The quasiexperimental qualitative collective case study with an extreme case sampling strategy examined the relationship between teacher training and student academic achievement.

Research Questions

The study focused on the effects of teacher training for individual differences to improve the academic performance of special education inclusion students and asked the question:

1. How will teacher training for individual differences affect the academic performance of special education inclusion students?

Other questions considered include:

2. What effects will teacher training have in regards to the inclusion of the majority of the levels of learners in the mainstream environment?

3. What do skilled teachers who work with children do to successfully complete the teaching and learning process in getting the information from the teacher to the student?

4. How will special educations inclusion students in California gain advantages for academic success when taught by teachers with training to recognize and incorporate individual differences into the mainstream curriculum?

Design of Study

Multidisciplinary roots in special education laws, bylaws, policies, and procedures provided the basis for the quasiexperimental qualitative collective case study tradition in the discovery of the relationship between teacher training and student academic performance. The study sought to determine if there was a difference in the academic success of special education inclusion students when their teachers did or did not have training for individual differences. The quasiexperimental study took the form of a collective case study to gather multiple data from different classes, allowing for data triangulation of the sources. The narrative report focus concludes with a thick description in chapter 5 discussing themes, issues, and implications aimed at the discovery of teacher effectiveness and inclusion student academic outcome improvement as a result of teacher training in individual differences.

The grounded theory qualitative tradition was considered for the study of teacher effectiveness and student academic outcome improvement as a result of teacher training in individual differences using Gardner's multiple intelligences (MI) theory (1983, 1993) as a basic idea for teacher training which includes Vygotsky's zone of proximal

development (1962). Upon examination of the grounded theory characteristics (Creswell, 2003) negative aspects began to arise. First, the multiple intelligences and zone of proximal development theories already existed, thus the data collection would be deductive and not inductive, as is necessary in the purpose of grounded theory research. The open ended interview necessary for grounded theory data collection requires interviews for 20-30 participants and is not conducive to the limited time constraints that the researcher found available within the school setting.

Another tradition considered and abandoned due to time constraints was a quantitative study design examining the relationship between teacher training and student academic achievement. The control group interrupted time series quasiexperimental design (Campbell & Stanley, 1963), consisting of two groups not randomly assigned, with observations over time using a treatment (teacher training) administered to only one of the groups proved impossible to conduct due to the time constraints dictated from various school districts. A single semester time period was allotted for the research study to be conducted and concluded, thus eliminating another design under consideration. The control group interrupted time series quasiexperimental design was abandoned leaving the qualitative tradition nonequivalent control group quasiexperimental design available to consider. According to Campbell and Stanley (1963) the qualitative tradition nonequivalent control group quasiexperimental design is not conducted over an extended period of time as is the control group interrupted time series quasiexperimental design (p. 47-50). Time constraints were discovered to be the major component for abandoning one design over another.

The nonequivalent control group design was strongly considered for a quantitative study examining the availability of two groups consisting of naturally assembled classrooms. The groups are similar in nature in that they consist of special education students enrolled in mainstream courses, but not similar enough to eliminate the use of the pretest scores. Each group of participants would consist of enrollment in the same course with identical requirements as designated by school district policy for the course of Algebra I. The researcher designated the X (teacher training) to one group or the other (Campbell & Stanley, 1963). One teacher will have training in incorporating alternative learning styles, and the other teacher with no training will use regular mainstream teaching methods without accommodations.

The semester grades would serve as one of multiple measures to answer the question: Does teacher training specifically designed to incorporate individual differences into the regular mainstream curriculum affect the academic success of special education inclusion students? Using only semester grades limited the data collection leaving threats to the internal validity of the data, thus continuing the pursuit of the nonequivalent control group design was fruitless. Weighing into the decision against examining further the nonequivalent control group design was the factor that random selection was difficult to achieve. Preassembled classes exist due to enrollment placement of the special education students into mainstream courses, programmed by the counselor. The researcher must be careful not to undermine the counselor placement of the inclusion students into the mainstream classes, which could be reflected as a negative decision on

the part of the researcher. Thus, the decision to abandon the nonequivalent control group design for a quantitative study was made.

The quasiexperimental collective case study tradition better fit the criteria for the qualitative research study that examined the relationship between teacher training and student academic achievement. The availability to collect multiple data from different classes existed, allowing a triangulation of data sources such as teacher observations and anecdotal records, video recordings, class projects and assignments, and semester grades. A pre- and posttest that represents student academic success, motivation, and levels of success, or the lack thereof was also available for examination, as well as the students' semester grades. Ideas for themes, issues, and implications began to emerge as the study traditions were considered (Trochim, 2001).

Desired outcomes for the research study pointed away from the qualitative grounded theory design, the quantitative control group interrupted time series quasiexperimental design, and the quantitative nonequivalent control group quasiexperimental design. A logical conclusion for the chosen quasiexperimental qualitative collective case study design (Creswell, 1998; Johnson & Christensen, 2003; Merriam, 2002) to examine the relationship between teacher training and student academic performance for the desired outcomes became obvious after careful consideration of other traditions and paradigms.

Participant Selection and Sampling Strategy

The participants for the study were identified through the special education resource program department records with permission from the assistant superintendent

and the special education department. The participants were selected with the assistance of the special education district program director examining programmed high school students mainstreamed as inclusion students into the regular curriculum classrooms, have reading levels above the 6th grade level (FAPE, 2006). After the programming was complete, the researcher discussed with the director which teachers did or did not have training, and where the students were placed in order to divide the participants into the two groups, with trained or untrained teachers.

Students with an Individualized Education Program (IEP) identifying a disability area in need of accommodation qualified for the study. The student participants were identified with minimal disabilities in three or less areas of development, some of which were identified as mild organizational disabilities (FAPE, 2006). To qualify for the resource program high peaks of cognitive ability are recognized as the initial criteria, with three or fewer areas recognized as below average criteria, in need of additional educational accommodations, thus constituting the special education identification. A parent/guardian consent form and a participant consent form were obtained for every participant in the study (Walden University, 2005).

The extreme case sampling strategy (Creswell, 1998) was used to select the participants by utilizing a random selection process for a total of 20 special education inclusion students, drawn from the population of special education inclusion students enrolled at the beginning of the academic year, utilizing the enrollment of combined Algebra 1 (Mathematics framework for California public schools, 1999) classes**.** Participants were the students in the regular mainstream inclusion classes taught by the

teachers at either extreme: teachers who have had individual differences training at one extreme where 10 students were chosen, while the other extreme was a selection of 10 special education inclusion students taught by teachers without any training in individual differences. This selection provided a homogeneous sample of high school students between the ages of 14 and 17.

The population for this study consists of 210 high school special education inclusion students from an environment in California enrolled in the special education program. The accessible population, 140 resource students out of 210 special education students, was used to obtain the 20 students for the extreme case sampling strategy, utilizing the enrollment of combined Algebra 1 classes selected by the high school counselors for effective control determined by similarity of groups. Two thirds of the special education resource student population from a high school in California (140/210 students) was considered for the study. The question addressed by the study sought to discover if teacher training was predictive of the academic success of special education inclusion students, by asking the question: How will the effects of teacher training for individual differences improve academic performance?

Role of Researcher

The researcher was in no way affiliated with the research site other than in the role of conducting the research study through the collection of data. A search for emerging holistic themes was conducted by the researcher in the study that examined the effects of teacher training of individual differences, alternate learning styles, to improve the academic performance of resource inclusion students in the mainstream environment.

The nonsurvey data collection of individual high school semester grades for Algebra 1 special education inclusion students, ordinal data, was collected from official school district transcripts by the researcher with parental/guardian permission. The researcher did not approach the participants in order to respect the privacy of the students. The data collection took place away from the high school campus at the district office of the assistant superintendent to protect the anonymity of the participants where the study was being conducted.

A necessary part of the role of the researcher for the research study that examined the effects of teacher training for individual differences to improve the academic performance of special education inclusion students was to establish an agreement between the school district superintendent and the researcher to keep disruptions away from the participants and the teachers. A sensitive nature developed in the mid 1980s that continues to the present day in the process of how and when the resource inclusion students are mainstreamed into the regular education environment. The high school resource students and teachers consider the mainstreaming process an accomplishment, an unwritten rite of passage, which can lead into the eventual dismissal of the need for special education services.

The researcher was strongly encouraged to keep interruptions between the students, teachers, and the special education support personnel to a minimum. The personal interest of the need for privacy and anonymity stems from the researcher experiencing first hand the process from the 1980s to the present when resource students were first mainstreamed out of the one room classroom environment of special education

(Kneeler & Tarver, 1977). The protection of the privacy and anonymity of the inclusion resource students may be considered a potential bias and connects the personal interest of the researcher to the research topic. The ultimate goal of a resource student is to demonstrate success in the mainstream classroom environment. If success is demonstrated, then dismissal from the special education resource program is warranted.

The need for the researcher to remain anonymous to the participants by not approaching the participants was necessary in order to respect the privacy of the students. A metamorphosis occurred in the 1980s when the resource students no longer felt singled out or labeled, finally reaching a plateau where students with needs for special services were respected enough to be included into the mainstream environment. If inclusion resource students succeed in the mainstream environment then success for the students outside of the special education support services was demonstrated. The presence of the researcher could be misconceived as indicative of further need for special education services, thus perceived by the participants as a step backwards in the process of mainstreaming.

To protect the anonymity of the participants, the nonsurvey multiple data collection of computer recorded semester grades that represent student academic success, motivation, and levels of success, or the lack thereof, pre- and posttest results, hand written teacher observations and anecdotal records, or video recordings of class projects or assignments took place away from the high school campus where the study was being conducted. The researcher collected the data that was recorded from classroom teacher records after the data was placed in a sealed envelope and delivered to the assistant

superintendent at the district office, the last week of the semester. Pre- and posttest results were collected by the researcher the week after each test was administered, at the beginning of the study and again at the end, at the district office after the teachers placed the test results in a sealed envelope.

Data Collection Procedures

The research study data consisted of a survey and nonsurvey collection. High school students enrolled in the special education resource program and simultaneously enrolled in inclusion mainstream Algebra 1 classes from a mix of predominately Hispanic, White, and African American cultures in Southern California make up the bounded system for the research study that examined if teacher training was predictive of the academic success of special education inclusion students, by asking the question: How will the effects of teacher training for individual differences improve academic performance? Other questions to consider and data collection procedures are displayed in Table 1.

The procedures took place over a single high school semester and stem from naturally assembled Algebra 1 classes that had a student enrollment consisting of inclusion students mainstreamed into regular education classes, and regular education students. One group of inclusion students mainstreamed into regular education classes, consisted of students taught by teachers with training for individual differences, to be called Group A. The other group consisted of students taught by teachers without individual differences training, to be called Group B.

Table 1
Data Collection and Questions

Question	Data Collection: Survey/Nonsurvey Supports	Data Collection Procedure/Analysis
How will the effects of teacher training for individual differences improve the academic performance of special education inclusion students?	Nonsurvey data: Teacher anecdotal records supports need for more hands-on interactivity; more group/peer work; more variety in curriculum planning outside of logical/linguistic models (lecture/take notes format is the current format used in academia today) through emerging holistic themes and patterns.	Chenail's Qualitative Matrix (Cole, 1994, p. 2): tendencies, range, expected, and unexpected outcomes with themes of positive and negative categories. Positive: learning style preference, strengths, interests, family relationships, technology, testing preferences: verbal/written; Negative: dropout rate, low/failing grades, ditching, weaknesses, tutoring needs.
What effects will teacher training have in regards to the inclusion of the majority of the levels of learners in the mainstream environment?	Student Survey: Multiple Intelligences Inventory supports the understanding of learning modalities with connections to all intelligences	Online survey print outs/directly connected to mrsswindler.com Internet link Bar graph will display results with key to explain bar graph results of student strengths
What do skilled teachers who work with children do to successfully complete the teaching and learning process in getting the information from the teacher to the student?	Teacher Survey supports teacher attitudes of training. Nonsurvey data supports variety in methods	The total numerical value will be calculated from the five point Likert scales of responses, displayed in a table, with a summarized written analysis.
How will special educations inclusion students in California gain advantages for academic success when taught by teachers with training to recognize and incorporate individual differences into the mainstream curriculum?	Pre-Posttests results support successful understanding of curriculum Semester Grades support passing criteria of state standards/exit exam	Teacher administers tests, completes grades, and turns in results. Table of differences in the academic outcome of special education inclusion students taught by teachers who had and not had training displays results.

Nonsurvey data collection tools consisted of identical closed question pre- and posttests, semester grades, teacher observations and anecdotal records, including recordings of class projects and assignments, according to teacher discretion in the interpretation of the curriculum. The data collection of teacher observations and anecdotal records differed between the two groups as some teachers used methods conducive to training for individual differences, alternate learning styles, and other teachers did not. Documents consisting of teacher assigned projects, student journals, and attendance records kept by the classroom teachers were collected by the researcher at the end of the designated semester from the district office of the students under observation as determined by the researcher. The documents were delivered to the district office of the assistant superintendent labeled with student identification numbers to protect the privacy of the participants.

The pre- and posttests were identical to both groups and previously field tested by mathematics teachers (Creswell, 2003) collaboratively with input from the researcher. The regular mainstream inclusion teachers without training and the mainstream teachers trained in individual differences administered the tests on the same day and at the same time at the high school location of the study at the beginning of the semester, and again at the end of the semester. Pre- and posttest procedures were part of the regular curriculum of the class, developed by the classroom teachers collaboratively, with input from the researcher. Distribution, administration, collection, and grading of the tests were done by the classroom teachers. Continuity of the classroom environment and protection of the

anonymity of the study participants added objectivity to the study (Ratner, 2002), and minimized disruption to the participants (Creswell, 2003).

Semester grades were collected from the high school records office in a sealed envelope by the researcher the day semester grades were posted and were used comparatively with the pre- and posttest scores. Due to the validity and reliability of the school district policies on test making and taking, and reliant on the validity and reliability of grading policies, the researcher used the published policy found on the website of the district governed by the Public School Accountability Act (PSAA), more directly governed by the Standards adopted by the California State Board of Education for English-language arts, mathematics, history-social science, science, and visual and performing arts (California State Standards, 1999).

The anecdotal records and observations were recorded by the special education support personnel that included a credentialed teacher or an instructional assistant trained in record taking procedure, in collaboration with the classroom teachers. The special education department provided an assigned teacher or instructional assistant to the classroom for the semester to support and co-teach on a daily basis with the regular education teachers (FAPE, 2006). The anecdotal records were collected from the high school records office in a sealed envelope by the researcher the same day the semester grades were posted.

A teacher survey using a Likert-type (1932) scale regarding any previous training to work with special education resource students was developed by the researcher according to the guidelines by Fink and Kosecoff (1998). The researcher wanted to find

out if (a) teachers have received any type of training for the individual differences of the special education inclusion students enrolled in mainstream classes; and (b) the success rate (passing semester grade) of the students, so a survey was distributed by the researcher using the following procedure: The data collection for the teacher survey took place at the school district office of the high school where the students were selected as participants for the study. The researcher attended the mathematics department meeting twice, at the beginning and at the end of the study. The assistant superintendent and the department chairperson introduced the researcher who (a) introduced the study; (b) distributed the survey; (c) allowed time for completing the survey; and (d) collected the survey in baskets (discussion time allotted for after the meeting).

The plan for establishing the validity of the survey consisted of reporting the negative or discrepant information that surfaced and countered the themes of the data collection (Creswell, 2003). The researcher's belief was that with the data collection results used as evidence it can be shown that teacher training programs were positively related to the academic success (a passing grade) of special education inclusion students which differed from some teacher beliefs. Teachers who had and not had individual differences training were given the opportunity to discuss the results of the data findings at a mathematics department meeting following the final collection of the data. The study was strengthened with the discrepant information included, presenting a balanced view to the readers of the data collected, and can be found in chapter 4.

The plan for establishing the reliability of the survey was in the administration process of the survey. Appropriate faculty members were asked to answer the survey

questions twice, allowing analysis and interpretation to be applied to insure repeatability if necessary. A test-retest of the survey (Fink & Kosecoff, 1998) demonstrated that the correlation between the results was high: first occasion answers paralleled second occasion answers. Fewer survey items avoided confusion.

An online survey, called the Multiple Intelligence Inventory (McKenzie, 1999) regarding student learning styles was accessed and administered to the participants to discover student strengths. The special education department personnel assisted the student participants with the accessing and administration of the online survey through the researcher web site mrsswindler.com. A link to the survey provided instructions and the survey results were immediately forwarded to the researchers email address for data evaluation. Student identification numbers were the only form of identification requested upon entrance into the website when accessing the survey. The participants included the study designation: Group A: teachers 1 and 2 (trained) or Group B: teachers 3, 4, 5, 6, 7, and 8 (untrained).

Data Analysis and Interpretation

The researcher examined the survey and nonsurvey data: closed question pre- test (Appendix B, p. 187) and posttest (Appendix C, p. 188), semester grades, and teacher observations and anecdotal records, for emerging holistic themes and patterns and sought to find out if there were differences in the academic outcome of special education inclusion students taught by teachers who had and not had training in individual differences. A cross-case data analysis approach was used to examine the nonsurvey data,

as described by Johnson and Christensen (2004), “looking for patterns that cut across the cases” (p. 379).

The nonsurvey data was coded through a modified version of Chenail’s Qualitative Matrix (Cole, 1994, p. 2), using categories of central tendencies, range, and expected and unexpected outcomes as displayed in Figure 5. The ranges or themes of the collected data fell into positive and negative categories. The positive categories included learning style preference, student strengths, school interests, social interests, family relationships, interests in technology, and testing preferences: verbal or written. The negative categories included drop out rate, low grades, failing grades, ditching class rate, student weaknesses, and needs for tutoring. The hand written anecdotal records and observations collected from the teachers (Creswell, 2003, p. 188) were examined according to the Chenail Matrix guidelines (Cole, 1994), coded into central tendency and range categories, and charted. Changes in the coding categories were expected as serendipitous results occurred upon examination of the collected data (Merriam, 2002, p. 14), found in chapter 4.

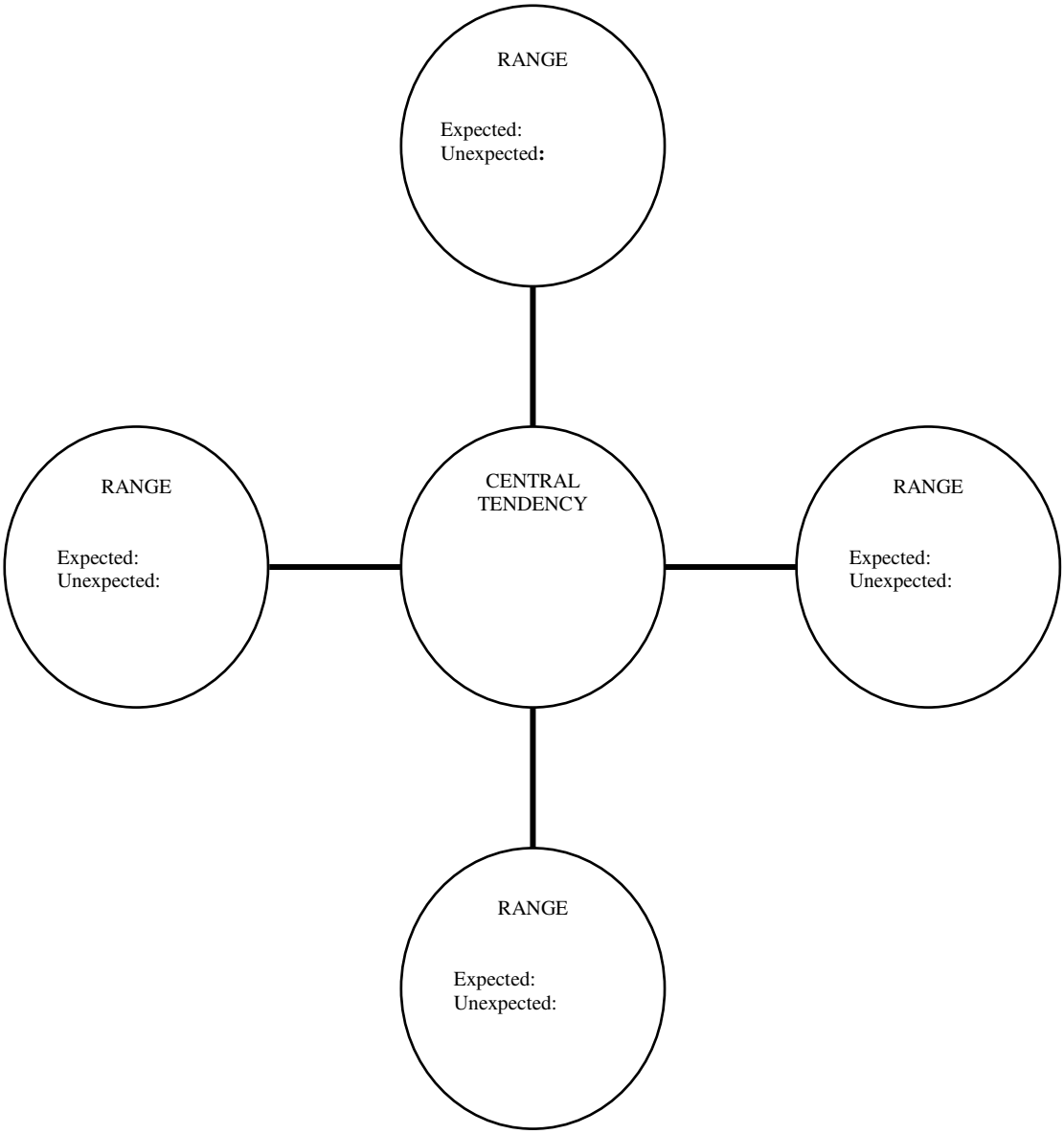


Figure 5. Chenail's Qualitative Matrix (Cole, 1994, p. 2) was used as a guideline for coding qualitative data of the proposed study.

The teacher survey developed by the researcher using a Likert-type (1932) scale was used to measure teacher training attitudes. A sample survey is included (Appendix D, p. 189). The survey asked the teachers to express agreement or disagreement of a 5-point scale with each degree of agreement given a numerical value from one to five. The total numerical value was calculated from all of the responses and displayed in a table. A written evaluation of the data was included. Fewer questions as seen on the survey in the appendix avoided confusion (Green & Salkind, 2005; SPSS, 2003).

The student survey accessed through the online webpage of the researcher, mrsswindler.com, was used to measure student preferences, which will translate to learning style strengths. A sample survey is included (Appendix E , p. 190). The survey was developed by Walter McKenzie (1999) and permission is granted to use the survey through the Internet link http://surfaquarium.com/MI/inventory.htm. A written evaluation of the data is included in chapter 4.

Evidence of Quality

The quasiexperimental qualitative collective case study tradition was chosen as the research design to best achieve the purpose of seeking to discover similarities and differences in the relationship between teacher training and student academic performance. Providing a thick description of the triangulated data collection results ensured the accuracy and credibility of the findings. Regular education without accommodations, centered in didactical teaching methods, has a tendency to unintentionally ostracize a population of learners who need the immediate attention of all

educators. Student academic achievement may be negatively influenced without further research to discover if teacher training in alternate learning styles makes a difference.

Data collection threats according to Johnson and Christensen (2004) may stem from heterogeneous focus group discussions within the classroom and will be avoided by using only homogeneous focus groups to promote discussion and diffuse cliques' formation (p. 185), as prearranged with the researcher and the special education director. Frontstage behavior threats (Johnson and Christensen, 2004, p. 190) to classroom observations disappeared as participants built trusting relationships with the classroom teacher, giving way to backstage behavior (Johnson & Christensen, 2004, p. 191). Frontstage behavior threat to video recordings disappeared as participants were graded by the classroom teacher, not the researcher as the observer, so anything other than backstage behavior resulted in the teacher lowering the presentation semester grade (p. 191), prearranged by the special education director and the researcher.

Triangulation of the data revealed the focus of the collective case study with a thick description of the content in detail. A discussion of themes or categories, issues, and implications aimed at teacher effectiveness and student academic outcome improvement as a result of teacher training in individual differences naturally emerged as the study results unfolded. The strategy that exuded the most power came from the ability to gather validation from many sources (Creswell, 2003). Numerous examples directly related to how the effects of teacher training improved student academic performance were needed to validate the research.

All data were stored in the possession of the classroom teacher for the duration of the study, one semester, until delivery to the assistant superintendent at the district office at the end of the semester where the researcher gathered the data. The researcher stored any physical data in a locked box and electronic data in a password protected file, to be kept for a period of 5 years.

Members checking, as it is called in the case study tradition (Creswell, 2003), revealed that teachers already enhance learning with alternative approaches used in daily teaching strategies. The members checking process asked the participants if what was being described was a true account from a personal point of view. Checking with the special education director and the assistant superintendent to the focal point of crystallizing the truth of the study, as told by Creswell (1998), substantiated and supported the goal of the researcher which was to convince the readers that the data presented was the truth, and not simply judgment from one perspective.

The term *respondent validation* is used according to Creswell (2003) "to determine . . . the validity of their accounts" (p. 211). After the second teacher survey collection process at the mathematics department meeting at the end of the semester, an informal discussion took place to ask the teachers opinions by bringing many sources together for members checking. The informal discussion also served as an external auditing process to insure quality of the collected data (Delevan, 2003) as the entire mathematics department was involved in the process of discussing the data collection results.

The gap between regular education and special education can be narrowed when awareness of individual differences, alternative learning styles, is brought to the forefront of teacher training. The urgency for research examining teacher training in the mainstream environment stemmed from the background of empirical evidence described in detail in chapter 2 of the literature review. Twenty-one years of informal researcher observations in the mainstream environment at the primary and secondary levels, as an instructional assistant, classroom high school resource teacher, classroom high school math teacher, and classroom 5th grade teacher provided the researcher with first hand observations to the mainstreaming of inclusion students. The urgency for the research study may be interpreted as researcher bias in the belief that the majority of students can learn when mainstreamed into the regular education classroom, albeit sometimes in an alternate learning style. Directly relating the unconventional alternative learning styles to the multiple intelligences theory (Gardner, 2006), backed with empirical evidence from Vygotsky's zone of proximal development (1962), the researcher bias was reduced.

A peer debriefing session included the assistant superintendent with background in special education, the special education department chairperson, the district level special education director, and the researcher to discuss the research data results. The examination of the classes with an enrollment of inclusion students took priority over regular education classes without inclusion students. A discussion regarding the data included needs for teacher training and focused on teachers with a propensity to teach classes that include placement of special education students in the regular education classes. Although the majority of students tend to benefit from the study results, the study

focused primarily on the special education community of learners enrolled in mainstream education inclusion classes.

Feasibility and Appropriateness

The assistant superintendent of the school district where the research study took place, and the researcher, established a need to study the special education resource students in the mainstream environment through separate inquiries and observations over separate careers in education. The idea that students benefit from the results of a research study supports the time and effort of the various district personnel and teachers asked to participate in the study. Students were selected as participants from intact Algebra 1 classes that were generated through a computer based programming process conducted by the high school counseling department. The selection process of the participants for the study served as the least possible method of disruption to the inclusion program.

The researcher did not require additional testing as teachers considered in the study conducted pre- and posttests previously established as regular classroom curriculum. Testing was conducted during class time as part of the routine instruction of the regular education curriculum so as to avoid any changes to the regular curriculum.

The cost of the research study was minimal, due to data collection as a minimal disruption to normal school classroom activity. Full cooperation of the school district, the mathematics department, and the special education department, allowed the researcher access to services necessary to conduct the research study from fruition to completion with the full support of the district assistant superintendent. The collection of data from

the teachers required minimal time for the researcher. The data analysis and interpretation consumed the majority of time after data collection.

The detail in the data collection, using an extreme case sampling procedure, provides sufficient information for any researcher to replicate the qualitative study. After the triangulation of the visual data: classroom observations, attendance records, and student documents, the researcher interpreted the data showing sufficient themes and implications to support the qualitative question: How will teacher training specifically designed to incorporate individual differences into the regular mainstream curriculum affect the academic success of special education inclusion students?

Informed Consent and Ethical Concerns

To protect the anonymity of the participants, the data collection took place away from the high school campus where the study was being conducted. Due to the limited number of participants, a balance was created through the depth of inquiry by collecting multiple sources of data: teacher observations and anecdotal records, recordings of class projects and assignments as decided by the classroom teachers, semester grades, and pre- and posttest results. Consent/assent forms from participants (Appendix F, p. 193) and parents/guardians (Appendix G, p. 195) were handled through district office personnel, as it was an important ethical consideration not to interrupt (Creswell, 2003) what takes place in the regular education classrooms with the inclusion resource students.

The researcher did not approach the participants in order to respect their privacy. Only the principal investigator had access to the data, but the names of the participants were masked. Classroom teachers used student identification numbers to identify the data

before handing it over to the district office personnel, but the researcher did not have access to the student name and identification number equivalents.

The district office special education director and personnel distributed the consent forms to all student participants, explaining reasons for the informed consent forms as a request for participation in a research study. To protect anonymity of the resource students under consideration for participation in the study the students in the class were asked to return signed consent forms. Separate forms for student participants and parents/guardians were distributed to the students in the class. A discussion ensued after distribution of the consent forms to allow time for questions to be answered. A parent/guardian consent form was obtained from each participant, as well as a student consent form, so as to avoid any confusion into the competency of the student participants.

The high school resource students participating in the study have a reading competency above the 6^{th} grade level. A special education teacher normally assigned to the classroom collaborates with the regular education teacher (FAPE, 2006) and was present for the question and answer session. Students were asked to return the signed parent permission consent form to the district office the next day. The signed consent forms were delivered to the district office of the assistant superintendent, the initial contact, for the researcher to pick up upon notification of the delivery of the forms.

The complete copy of the request to the Institutional Review Board for approval to conduct research (Walden University, 2005) is included (Appendix A, p. 163).

Summary

Students have the capacity to learn, albeit sometimes using an alternate learning style. Alternate learning styles are conducive to the learning capabilities of students in the special education program as well as to the learning capabilities of regular education students. The quasiexperimental qualitative collective case study research design was chosen to enable replication of the proposed study for the benefit of the majority of students. The general over-arching questions sought to determine whether the effects of teacher training for individual differences will improve the academic performance of special education inclusion students. The research data interpretation (Johnson and Christensen, 2003, p. 79) was used to predict future outcomes of inclusion student academic success.

The study sought to determine if the incorporation of teacher training into current pedagogical practice will heighten educator awareness of alternate learning styles, also known as individual differences, thus affecting academic outcomes for inclusion students. The academic outcomes of special education high school resource inclusion students, taught by teachers with and without training in individual differences, were contrasted by the researcher using numerous data collection tools that included survey and nonsurvey items. Data collection procedures, data analysis, and data interpretation followed specific guidelines as previously outlined in chapter 3 with the evidence of quality to ensure the accuracy and credibility of the findings of a qualitative study. The feasibility and appropriateness of the research study was supported by the school district in which the

study took place, with informed consent and ethical considerations carefully outlined in the request to the Institutional Review Board included in Appendix A on page 163.

The research study provides ample documentation through surveys, observations, and handwritten or electronic documents, the three major traditional sources of data in qualitative research (Merriam, 2002, p. 12). The documentation supports the collective case study that searched for meaning and understanding of the phenomenon of the inclusion student with alternate learning styles mainstreamed into the regular education environment. The manner in which social science research is conducted and written (Field, 1991, p. 2) challenges researchers today in the new millennium. Adapting the curriculum to reach and serve the majority of the levels of learners is supported through the research study results. The future benefits for the various levels of learners comes in the renewed perception that it is not as difficult as once perceived through the eyes of regular education teachers to adapt the curriculum for the majority of learners.

Without taking risks social science is very limited in the ability to effect social change (Day, 2002, p. 9) and if researchers "challenge the boundaries of what is acceptable writing and what it is acceptable to write about" (p. 3), the implications for social change become more powerful. Current pedagogical trends are in transition and school districts need to incorporate workshops, seminars, and in-service training sessions for individual learning styles to ease the transition process in converting mainstream teaching styles into adaptable curriculum for the various learning styles. Chapter 4 presents the interpretation of the results, and chapter 5 discusses the implications for social change when mainstream curriculum is altered to accommodate learning styles.

CHAPTER 4: RESULTS OF THE STUDY

Introduction

The description, analysis, and interpretation of the collected data of the case study are clearly presented in chapter 4. The purpose of the quasiexperimental qualitative collective case study was to examine the relationship between teacher training and student academic performance to determine if there was a difference in the academic success of special education inclusion students when their teachers do or do not have training. The data generated, gathered, and recorded verify the results through patterns, relationships, and themes using figures, tables, and written summaries. The figures and tables provide a snapshot view of the data results offered as a preview to the reader, leading to more detailed written summaries and descriptions organized by questions.

The mainstreaming of inclusion students into the regular education environment was the phenomenon observed in the research study combining the overarching concepts of the framework of multiple intelligences (Gardner 1983, 1993), related to the framework of the zone of proximal development (Vygotsky, 1962). Rosenberg (2000) explains that the unobserved processes are identified from observable phenomenon, which in turn tests theories (p. 103). Regular education classroom teachers currently face an influx of students with alternate learning styles, perceived to be inadaptable to the regular education curriculum (Snowden, 2003)—the unobserved processes.

The study sought to address some of the educational issues regarding the need for teacher training. The inclusion laws mandated by the least restrictive environment clause, listed on the special education student Individualized Educational Program (IEP),

continue within academia to alter the regular mainstream education environment (Cauley, Linder & McMillan, 2001)—the observable phenomenon that tested the theories of the conceptual framework of the study (Rosenberg, 2000). The problem was that nearly four decades after the first enacted legislation that changed the environment for special education learners, the empirical evidence provided only a glimpse of the effects of teacher training from limited studies. Studies were found in abundance regarding the social integration of special education students into mainstream classrooms, but the academic performance outcomes were rarely studied in regards to teacher training.

The collective case study specifically designed from the problem expanded on the current research. The research study adds a dimension to the current body of available scholarly literature on whether teacher training has an effect on special education inclusion students' academic success. The relationship between the research questions, the data collection, and the data analysis is found in chapter 3 (see Table 1). The questions guiding the collection of data are as follows:

1. How will teacher training for individual differences affect the academic performance of special education inclusion students?

2. What effects will teacher training have in regards to the inclusion of the majority of the levels of learners in the mainstream environment?

3. What do skilled teachers do to successfully complete the teaching and learning process in getting the information from the teacher to the student?

4. How will special educations inclusion students in California gain advantages for academic success when taught by teachers with training to recognize and incorporate individual differences into the mainstream curriculum?

Participants for the study were grouped accordingly: One group of special education inclusion students mainstreamed into regular education classes taught by teachers with training for individual differences were called Group A. The other group consisted of special education inclusion students taught by teachers without individual differences training, called Group B. The findings are presented by research questions through the use of five data collection instruments, obtained from the two groups.

Data Collection

Relevant to the purpose of the study, the five instruments of data collection included: (a) the Multiple Intelligences Inventory (see Appendix E): Student Learning Style Online Survey (McKenzie, 1999), (b) the special education inclusion student survey for teachers (Appendix D) pertaining to student success or previous training, (c) student semester grades, (d) the teacher observation rubric for inclusion mathematics students (Appendix H) with anecdotal records and notes, and (e) individual student scores from pre- and posttests (Appendixes B and C).

The strategy that exuded the most power came from the ability of the researcher to gather validation from many sources (Creswell, 2003). The accuracy and transferability of the results came from numerous examples further explained and displayed in the tables and written descriptions of chapter 4. The data collection instrument results reflect the positive effects of teacher training to improve student

academic performance needed to validate the research. Negative and discrepant information is included to balance the credibility of the study.

The research study provided ample documentation through surveys, observations, and handwritten documents, the three major traditional sources of data in qualitative research (Merriam, 2002, p. 12). Strategies include: (a) Response patterns coded and organized using a modified version of the Chenail Qualitative Matrix (Cole, 1994, p. 2) found in Figure 6 chapter 4, (b) members checking with the special education district director and staff to insure that the interpretation of the student responses and survey questions were accurate, (c) consulting with professional educators from the special education and mathematics department to review that the data findings were trustworthy, and (d) identifying negative and discrepant results that may reveal serendipitous findings.

The data collected in the study were sorted through a system created by the researcher using tallies on frequency tables, identifying subheadings, and organizing the data which resulted in the division of the patterns into two categories, one with a positive theme and the other with a negative theme. The responses were divided into subheadings, which evolved into a range of patterns. The range of patterns naturally emerged into the division of a positive theme and a negative theme: responses → subheadings → range of patterns → a positive theme or a negative theme. The findings were triangulated from the multiple collection tools that are displayed in a matrix found in Figure 6 chapter 4, and presented in subsequent Figures 7—10 in chapter 4. The results are presented in the figures using various methods that include percentages, a Likert scale, and mean scores of the collected data. The analysis and interpretation of the data are reported in chapter 5.

Due to the volume of collected data in need of organization, the preliminary system was instrumental in creating order with the data collection (Hatch, 2002). The data naturally emerged into a positive theme and a negative theme in each range, as presented in Figure 6 for an easy visual interpretation, furthered explained in detail throughout chapter 4.

The Multiple Intelligences Inventory (McKenzie, 1999) was accessed online by the student participants through the webpage of the researcher, mrsswindler.com, and submitted electronically. Instructional assistants were provided to support the needs of the special education students participating in the mainstream mathematics courses, assisted when necessary with the online inventory. The purpose of the inventory was to gather data from the special education students participating in the mainstream mathematics courses to discover the learning style of the individual participants (Figure 7). Responses from Group A: students with a trained teacher, and Group B: without a trained teacher, evolved naturally using coding to create subheadings for organization. The subheadings listed on Figure 7 were taken from the online inventory responses, divided and displayed according to Group A and Group B strengths in the categories of Gardner's Intelligences: naturalist, musical, logical, existential, interpersonal, kinesthetic, verbal, interpersonal, and visual. Student participants recorded their strengths on the inventory that was divided into sections with section 3 used to total and display the strengths on a bar graph through the use of percentages. The inventory was used by the teachers as a review of the curriculum for lessons on creating and interpreting bar graphs, tallies, surveys, and figuring percentage. Figure 7 displays the results in percentages

according to the areas of strengths for Group A and Group B, categorized by the multiple intelligence inventory categories.

The special education inclusion student survey for teacher questions were limited to five, and categorized according to the teacher perceptions of special education inclusion student success with regards to teacher training (Figure 8). The results of the survey were tallied and charted when received by the researcher using a Likert scoring system of 5 to 1 assigned to responses ranging from Strongly Agree to Strongly Disagree. The survey was designed to find out if (1) teachers had received any type of training for the individual differences of the special education inclusion students enrolled in mainstream classes, and (2) the success rate (passing semester grade) of the students. Figure 8 displays the results as options for social change according to the teacher responses to each question, using a bar graph with the Likert scale scoring system.

The data collected from the observation rubric were coded, tallied, and divided into subheadings using a modified version of the Chenail Qualitative Matrix (Cole, 1994, p. 2) of range and themes branching out from the central tendencies, listed on the matrix as the four data collection tools. Similar patterns began to emerge, and the data collection naturally divided into the two categories, one with a positive theme and the other with a negative theme as seen on Figure 6, listed under the range of each data collections instrument. The figure provides a brief visual perception of the data from the observation rubric results, to be used in understanding the more detailed summary that follows in the results section of chapter 4, organized by questions.

Discrepancies that occurred were easily identified through the thematic approach when the data results from the student inventory responses, teacher survey responses, and the observation rubric were coded, charted, and compared. The discrepant data fell into the outlier category, not easily adapted to any of the coded subheadings or the two themes. Details of the discrepant findings follow in the results section of chapter 4.

The student scores from the pre- and posttest and the final semester grades were recorded in figures developed by the researcher (Figures 9 and 10) using mean scores. The final grades were reported according to the guidelines from the published policy found on the website of the district governed by the Public School Accountability Act (PSAA), more directly governed by the standards adopted by the California State Board of Education for English-language arts, mathematics, history-social science, science, and visual and performing arts (California Education Code [1999], 2006). The mean scores were used to display the data in both figures to provide a snapshot view of the results for a visual perception of the data collection, to be used for a clearer understanding of the results with the detailed summaries that follow in the results section of chapter 4.

The patterns that naturally emerged from the student responses on the Multiple Intelligences Inventory reflect interconnectedness with the teacher responses in the special education inclusion student survey for teachers, coded using subheadings listed on the matrix leading into the division of two themes, positive and negative. When the collected student inventory responses and teacher survey data were triangulated with the teacher observation rubric responses, the positive and negative themes were supported by the subheadings that were found in the survey and nonsurvey data findings (Figure 6 and

Table 3). Identifying the positive and the negative theme from the data results were justified through the variety of collection tools used as the layers of analysis were interpreted (Creswell, 2003).

The positive themes included subheadings of learning style preference, student strengths, school interests, social interests, family relationships, interests in technology, and testing preferences: verbal or written, and teacher willingness to alter curriculum. The negative themes included subheadings of drop out rate, low grades, failing grades, ditching class rate, student weaknesses, family relationships, needs for tutoring, and teacher unwillingness to change or alter curriculum. Family relationships were found in positive and in negative responses. Strong family bonds reflected a positive response, and inversely weak family relationships were indicated through negative responses. Details of the subheadings are described in the written summaries of the results section of chapter 4.

Multiple learning styles are not limited to students. Adults often demonstrate a need to learn from more than a single modality of the written summary. The decision of the researcher to include figures of the results offers the reader a visual perception of the data. The figures are modified with a snapshot of the data, and if viewed in conjunction with the written summary, a cross-referencing analysis by the reader offers a more complete picture of the study results to better understand the effects of teacher training on the academic performance of the special education inclusion students. The written summaries are organized by the four research questions and precede the tables, with reference to the results using numbers to cite percentages, the Likert scale scoring, or the mean scores of the collected data as displayed in the tables.

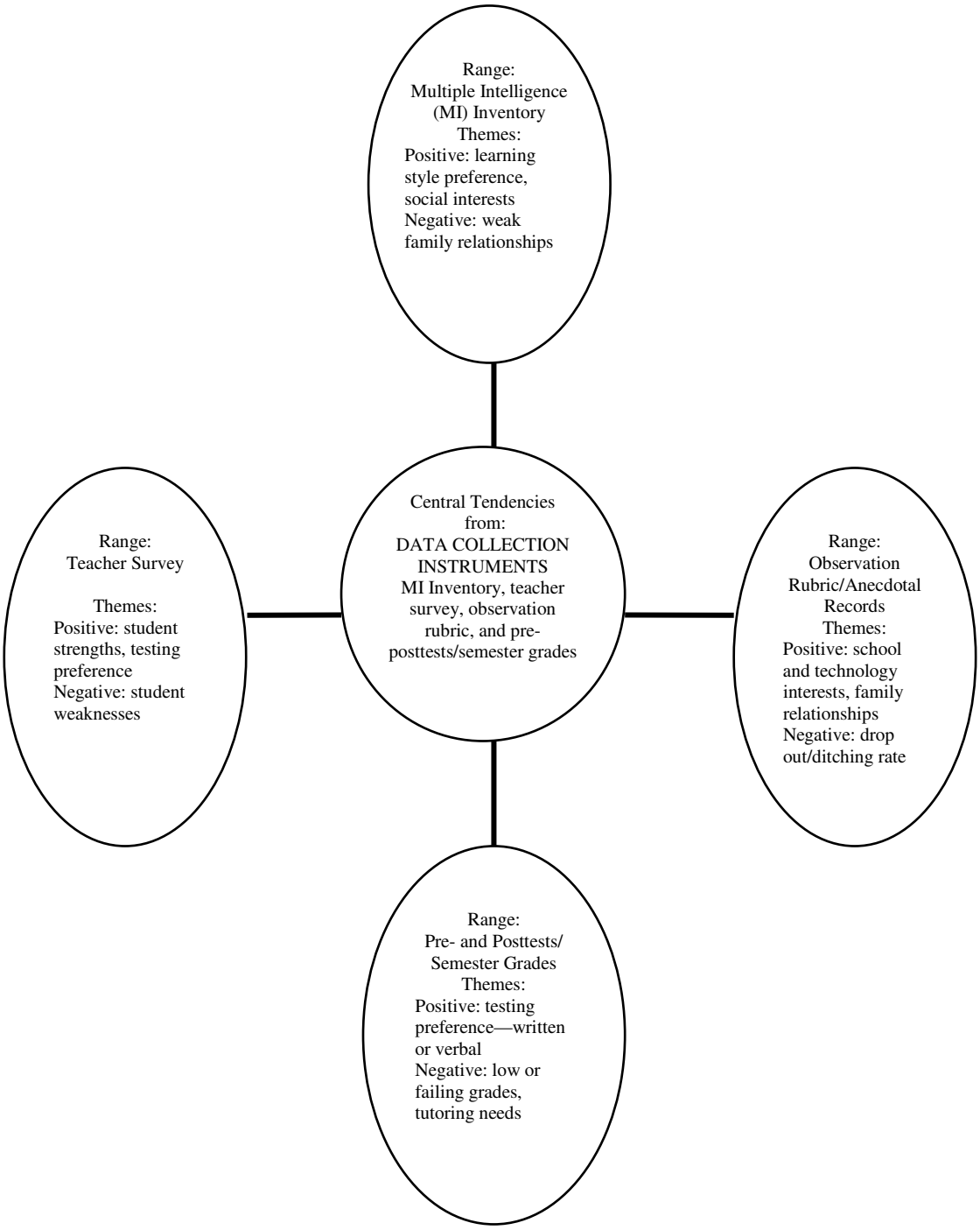


Figure 6. The data collection instrument matrix by range and theme is a modified version of the data collection provided as a visual aide for the reader.

Student Participants

The 20 high school special education inclusion students enrolled in Algebra 1 for the fall 2006 semester with an Individualized Education Program (IEP) identifying a disability area in need of accommodation qualified for the study. Dividing the participants into two groups was necessary to accomplish the purpose of the study: to examine the relationship between teacher training and student academic performance to determine if there was a difference in the academic success of special education inclusion students when their teachers do or do not have training. The student distribution with trained and untrained teachers fell according to the computer oriented counselor placement of the special education inclusion students into the mainstream mathematics courses. Ten students (one half) were programmed with trained teachers and ten students (one half) were programmed with untrained teachers as seen in Table 2.

Table 2
Distribution of Participants

	Trained teachers	Untrained teachers	*n*
Group A	Teacher # 1, 2		10
Group B		Teacher # 3, 4, 5, 6, 7, 8	10
Total			20

Results

Table 3 presents a visual outline of how the data collections were triangulated to answer each research question. The procedure and analysis used for each collection is simplified for the table presentation and briefly described in the table as a preview to the detailed summary that follows each question. The summary that follows the Table 3 presentation includes additional tables to further explain the data triangulation applicability to each question. The researcher is a visual learner and the inclusion of tables of the collected data is provided for additional understanding and cross-referencing to be used by the reader to better understand the details of the written summaries.

The results of the study were potentially impacted by three outlying variables, classified as discrepant findings not able to be coded or easily placed into a positive or a negative theme. The first variable to consider was whether mathematics is identified on the Individualized Education Program (IEP) of the student as a disability area in need of support from the special education department. The second variable considered as a potential impact was whether the student had previously taken the Algebra 1 course and was repeating the course due to an unsuccessful attempt to receive a passing grade. The third variable under consideration was the degree of support the student received from the special education department through a study skills course.

The data collected from the outlying variables were obtained from the student schedules and the Individualized Education Program (IEP), reported to the researcher from the special education district director and recorded as discrepant and nonconfirming

data in the findings. It was important to report the data collected from the variables as the impact from the outliers could have had an affect on the data results.

Table 3
Data Collection Procedure and Analysis

Question 1	Data Collection: Survey/Nonsurvey	Data Collection Procedure/Analysis
How will the effects of teacher training for individual differences improve the academic performance of special education inclusion students?	MI Inventory: An understanding of the results exposes the teachers to the multiple areas of strengths and weaknesses of the individual students. The differences for one student ranges from nine sections of strengths. If the 10 students within Group A or B were programmed into one classroom, with nine areas of strengths each, the indication is (10 x 9) 90 areas of strengths and weaknesses for the teacher to consider. If each scores at least a 50% benchmark in the Interpersonal (working with others) section (Group A scored 74%; Group B scored 82%), then the teacher can design more group work to improve academic performance, based on only one area of the MI Inventory for individual differences.	Chenail's Qualitative Matrix (Cole, 1994, p. 2): coded according to tendencies and range with themes of positive and negative categories. Tallies were used in a frequency table to gather the results. Positive: learning style preference, strengths, interests, family relationships, technology, testing preferences: verbal or written; Negative: drop out rate, low or failing grades, ditching class, weaknesses, tutoring needs
	Survey for teachers: suggested an interest in training; if any training has already been put into practice, and had the training been useful.	Likert scale of numerical values applied to the teacher survey responses, displayed on a bar graph
	Observation rubric: Teacher anecdotal records supported the need for more hands-on interactivity; more group/peer work; more variety in curriculum planning outside of traditional logical/linguistic models.	Nonsurvey records uncovered emerging holistic themes and patterns using a system of tallies on a frequency charts, displayed on a matrix
	Pre-posttests/semester grades: test scores indicated if improvement was a result of course preparation. Semester grades indicated readiness for the California High School Exit Exam (CAHSEE).	Comparison scores charted to indicate improvement; grades indicated mastery of concepts; mean scores reported on graphic display

(table continues)

Question 2	Data Collection: Survey/Nonsurvey	Data Collection Procedure/Analysis
What effects will teacher training have in regards to the inclusion of the majority of the levels of learners in the mainstream environment?	MI Inventory: An understanding of the inventory results as completed by the students exposes the teachers to the multiple areas of strengths. A positive effect occurs when shifting the instruction from where a student is weak to where a student is strong, placing value in each student, eliminating a preconceived negative connotation that inclusion students have no strengths to learn. The Multiple Intelligences Inventory supports the understanding of learning modalities with connections to various types of intelligences, in and out of special education programs.	Online survey print outs/directly connected to mrsswindler.com Internet link Bar graph displayed results using percentages with a key to explain the bar graph results of student strengths in nine areas including: linguistic, logical, spatial, bodily kinesthetic, musical, interpersonal, intrapersonal, naturalist, and existential
	Survey for teachers: Questions 1, 2, 4, and 5 responses directly supported inclusion students and the willingness of teachers to affect change.	Likert scale of numerical values applied to the teacher survey responses Bar graph displays results
	Observation rubric: Handwritten anecdotal records listing positive and negative patterns indicate teacher imaginations and professionalism to create workable solutions for the majority of learners	Nonsurvey records uncovered emerging holistic themes and patterns using frequency charts
	Pre-posttests/semester grades: scores indicated improvement from course preparation. Grades indicated mastery for CAHSEE readiness.	Comparison scores charted on a line graph to indicate improvement; grades indicate mastery of concepts shown with mean scores

(table continues)

Question 3	Data Collection: Survey/Nonsurvey	Data Collection Procedure/Analysis
What do skilled teachers who work with children do to successfully complete the teaching and learning process in getting the information from the teacher to the student?	MI Inventory: Skilled professionals using imaginative techniques reach the various levels of students using ranges of strengths in nine areas of capabilities and perceptions learned from the MI Inventory	Bar graph displayed results; key to explain results of percentages of student strengths in nine areas including: linguistic, logical, spatial, bodily kinesthetic, musical, interpersonal, intrapersonal, naturalist, and existential
	Survey for teachers: supported teacher requests/needs for training from questions 1 and 5.	The total numerical value was calculated from the five point Likert scales of responses, displayed on a bar graph, with a summarized written analysis.
	Observation rubric: supported variety in teaching methods through handwritten documentation	Nonsurvey records uncovered emerging holistic themes and patterns using frequency charts
	Pre-posttests/semester grades: test scores indicated improvement; passing semester grade indicated mastery of concepts for CAHSEE readiness	Comparison scores charted to indicate improvement; grades indicated mastery of concepts; mean scores displayed results on a line graph

(table continues)

Question 4	Data Collection: Survey/Nonsurvey	Data Collection Procedure/Analysis
How will special educations inclusion students in California gain advantages for academic success when taught by teachers with training to recognize and incorporate individual differences into the mainstream curriculum?	MI Inventory: Shifting the instruction from where a students is weak to where a student is strong, found in the Multiple Intelligence Inventory data, placed value in each student by eliminating a preconceived negative connotation	Chenail's Qualitative Matrix (Cole, 1994, p. 2) Bar graph displayed results using percentages
	Survey for teachers: supported teachers requests for training with questions 1-5	Likert scale of numerical values applied to the teacher survey responses; bar graph used for results
	Observation rubric: supported variety using alternate teaching methods through handwritten anecdotal records that indicated students are able to grasp abstract concepts	Nonsurvey records uncovered emerging holistic themes and patterns using frequency charts applied to the matrix (Table 1)
	Pre-posttests/semester grades: results supported successful understanding of curriculum; Semester Grades supported passing criteria of state standards/exit exam readiness	A line graph displays the academic outcome of special education inclusion students taught by teachers who have had and who have not had training using mean scores

Question 1

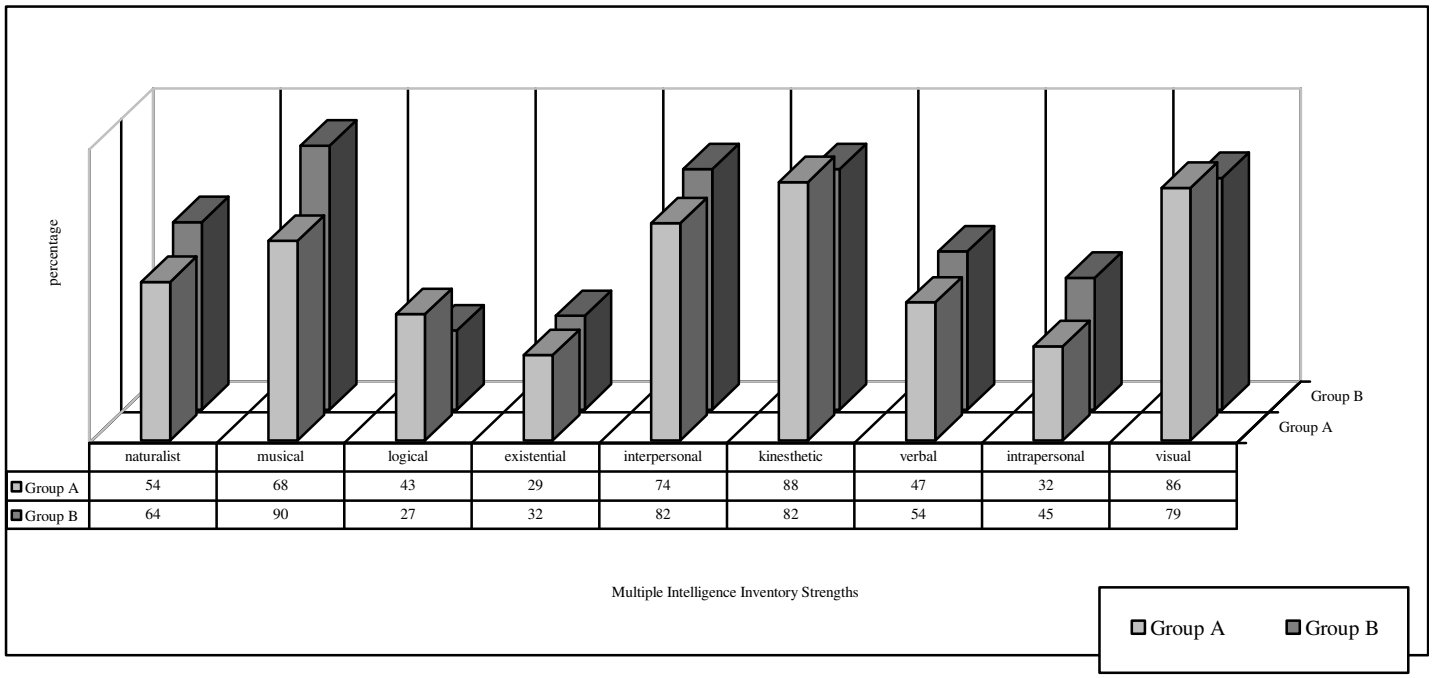
How will the effects of teacher training for individual differences improve the academic performance of special education inclusion students?

Following the collection of the inventory data from student participants, the researcher discovered areas of strengths displayed in Figure 7, indicating that all participants possess areas of strengths. The strengths of Group A from highest to lowest were kinesthetic 88%, visual 86%, interpersonal 74%, musical 68%, naturalist 54%, verbal 47%, logical 43%, intrapersonal 32%, and existential 29%. The strengths of Group B from highest to lowest were musical 90%, kinesthetic 82%, interpersonal 82%, visual

79%, naturalist 64%, verbal 54%, intrapersonal 45%, existential 32%, and logical 27%. The surveys from Group A teachers indicated prior training for multiple theories, whereas Group B teachers were not trained. An understanding of the results as displayed by the students through the responses exposes the teachers to the multiple areas of strengths and raises awareness to the weaknesses of the individual students that exist within the classrooms of each group.

If the students within the trained teachers' Group A or the untrained teachers' Group B were programmed into one classroom, with nine areas of strengths each (10 students per group x 9 areas of strengths), the indication is that 90 areas of strengths and weaknesses exist for the teacher to consider when planning curriculum. Using scores of 50% or higher as a benchmark in the interpersonal (working with others) category, as seen in Figure 7 for Group A (74%) and Group B (82%), the teacher can design more group work to improve the academic performance, based on the interpersonal category of the Multiple Intelligences Inventory for individual differences. Unfortunately, Group B teachers were not trained to recognize the areas of student strengths, so there was no group work designed for Group B even though the inventory indicated strengths of 82%.

In summary of Figure 7, examining percentage scores under 50% indicates that there is a mismatch of student strengths for learning and teachers' strengths for teaching. If students score under a benchmark of 50% in logical strengths, as seen in Figure 7 Group A (43%) and Group B (27%), then a weakness is recognized. The percentage results under 50% for Group B learning style in logical learning do not match with the lecture/take notes style of didactical teaching and learning for logical/linguistic learners.



	naturalist	musical	logical	existential	interpersonal	kinesthetic	verbal	intrapersonal	visual
Group A	54	68	43	29	74	88	47	32	86
Group B	64	90	27	32	82	82	54	45	79

Figure 7. The multiple intelligence inventory reflects the survey of student responses.

The survey question responses displayed in Figure 8 for the teacher survey in Appendix D include five questions with a strongly agree to a strongly disagree range, numerically assigned with a 5 to 1 Likert scale. The questions ask if special education students succeed without altering the curriculum, if curriculum is altered to accommodate individual differences, if any prior training had been received either through school support or individual acquisition, and if training were provided would teachers participate. Survey responses in Figure 8 from Group A teachers were reflected by the Likert scale response of 5s: strongly agree for questions 2, 3, and 4. The results indicate there was an interest in teacher training and that the training methods had been acquired, put into practice, and successfully incorporated into current curricular practices. Group B teachers responded that although the interest existed, minimal training had been received, reflected by Likert scale results of 1s: strongly disagree for questions 2 and 3.

In summary of Figure 8, question 1 (Likert scores of 1s) and question 5 (Likert scores of 5s) indicate that without teacher training, special education students do not succeed in the mainstream environment. Question 1 asked if special education students succeed without altering the curriculum, and the mean responses were 1s, strongly disagree. Question 5 asked if teacher training were provided would the teachers participate, and the responses were unanimously 5s, strongly agree.

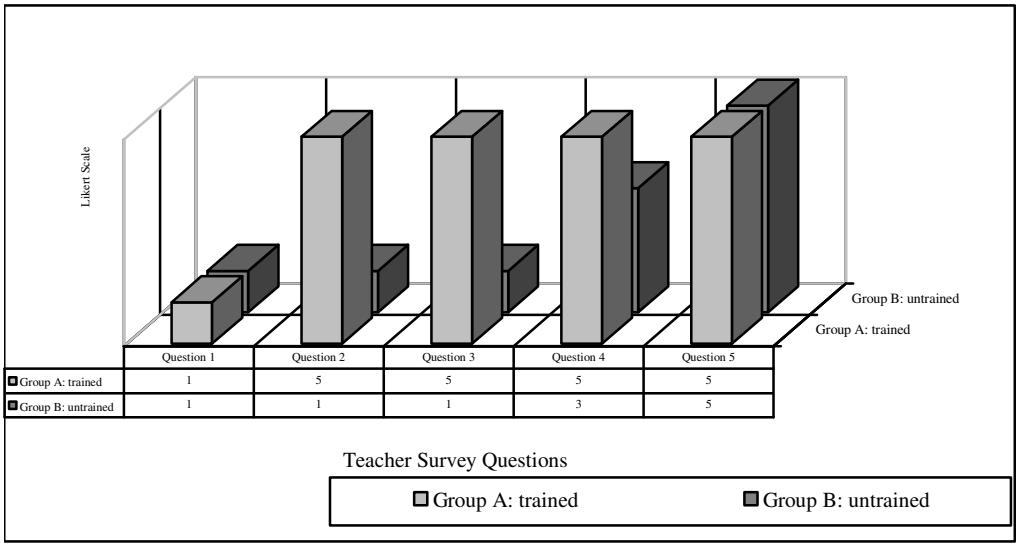


Figure 8. The teacher survey responses display the relationship of teacher training to student success.

Collectively, the observation rubric responses from the teachers offered serendipitous information. The researcher was seeking individual student performance reports, and the responses were written individually for each participant, as requested. A closer reexamination of the data revealed the gaps in the understanding of the needs of the student participants between Group A and Group B teachers. Where Group A responses were descriptions of group activity, peer reviews, and hands-on curriculum through the individual records, Group B anecdotal records from the untrained teachers described lecture/take notes activities that are currently practiced in mainstream academia. Group B students were limited to curriculum presentations that reach only logical/linguistic strengths, whereas Group A teachers presented curriculum to reach student strengths across all nine areas of the Multiple Intelligence Inventory.

The pre- and posttest scores from Group A and Group B student participants indicated whether an improvement took place as a result of preparation from the course, found in chapter 4 Figure 9. Group A mean scores improved between the pre- and posttest from 36% to 76%, and the Group B mean scores reflected a fluctuation—some improved, but most did not, with scores averaging from 39% to 52%. After a more careful examination of the discrepant information report from the special education department chairperson, the researcher discovered from the nonconfirming data that the majority of the students from Groups A and B were repeating the course from a previous semester. School policy required a grade of D or better to pass the course, which had not been previously obtained by the students in Group A or Group B.

Seven students from Group A and seven students from Group B were enrolled in the same course for the second time. Due to long term memory disabilities found in the student Individualized Educational Programs (IEP) from both Groups A and B, pre-test scores were low, 36% and 39%. After completing the course with trained teachers, Group A students raised scores, indicated in the mean posttest score of 76%. Group B scores were not high enough to pass the course to meet the criteria to take the California High School Exit Exam (CAHSEE). The scores were raised to a mean score of 52%, which did not meet the criteria to qualify to take the exit exam, where a score of 60% was needed.

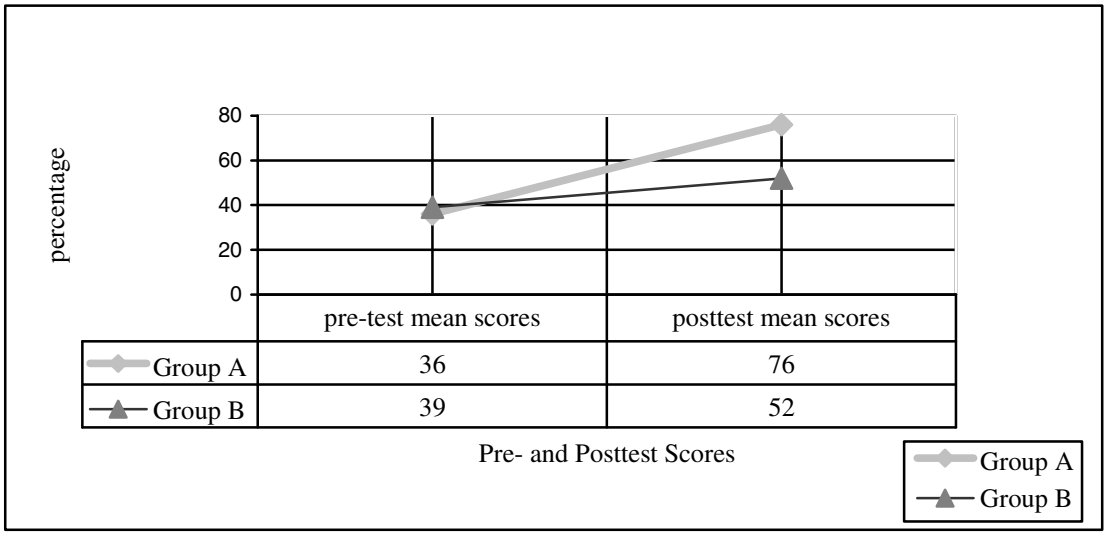


Figure 9. Pre- and posttest scores indicate improvement as a result of course preparation.

The passing semester grades of D 1.0 or better found in Figure 10 indicate mastery of concepts, and readiness to take the California High School Exit Exam (CAHSEE). CAHSEE results are not yet posted. Letter grade equivalents: A = 4, B = 3, C = 2, D = 1, F = below 1.0; Results: Group A = 2.9; Group B = 0.4.

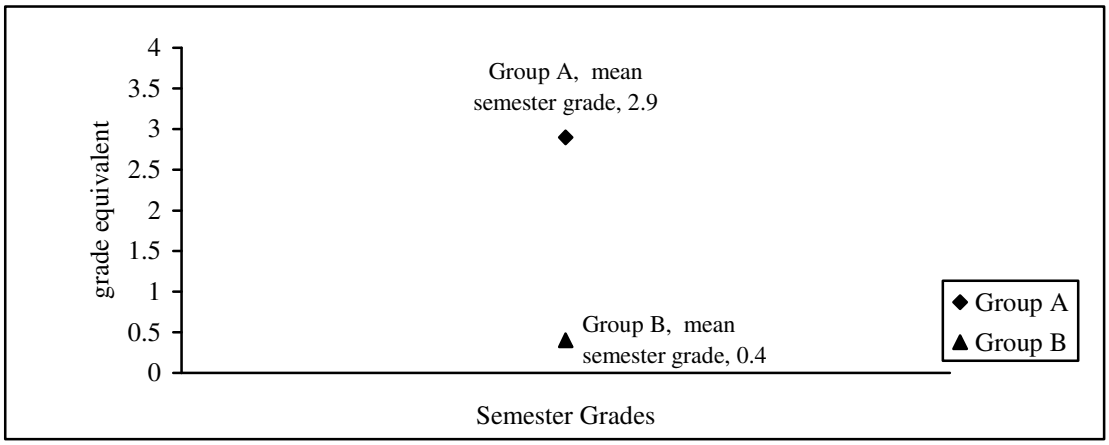


Figure 10. Student academic success meets criteria for the California High School Exit Exam (CAHSEE).

Question 2

What effects will teacher training have in regards to the inclusion of the various levels of learners in the mainstream environment?

The Multiple Intelligence Inventory results indicated that all the study participants possess areas of strengths as displayed in chapter 4 Figure 7 (see list of strengths and percentages following question 1). The effect is positive if mainstream instruction shifts from the current focus on student weaknesses to focus more on student strengths. Once trained to recognize value in individual student performance, the division between special education and regular educations lessens for the levels of learners in the mainstream environment. As a result, a preconceived negative connotation that inclusion special education students in the mainstream environment have limited strengths to learn is eliminated. The Multiple Intelligence Inventory supports the understanding of learning modalities with connections to the types of intelligences, reflecting a positive effect.

Questions 2, 4, and 5 of the survey for teachers directly supported inclusion students and the willingness of teachers to affect change with a Likert score of 5s, strongly agree, when asked if curriculum was altered to accommodate inclusion students. Question 3 indicated if any training has been received by high Likert scores of 5s, providing a natural division into the group of either trained or untrained teachers. Figure 8 results indicated that Group A has already affected change with the strongly agree score of 5s for questions 2-5, and that Group B is willing to change (5s) but has not received the opportunity for training (1s). Question 5 overwhelmingly supports the willingness to attend teacher training if it were made available, as both groups responded with strongly

agree (5s). Question 1 teacher responses of 1s, strongly disagree, counter balanced the responses to Question 5, strongly agree 5s. In summary of Figure 8, without altering the curriculum special education inclusion students do not succeed and do not earn a passing semester grade.

Handwritten anecdotal records found on the observation rubric listing positive and negative patterns indicated the professionalism of teachers with imaginations to create workable solutions for the learners. For example, the concept to calculate surface area using measurement, presented from a previous lesson, was difficult for some students to grasp. One teacher shared anecdotal records from a day when the electricity went out, but class was not cancelled. The teacher took the students out to the lunch quad with tape measures where the cement tables provided a perfect hands-on lesson of measurement for the concept of figuring the surface area of the tabletops. Other teacher responses included more hands on activities, and the pairing of students with partners for social and academic support where a socially weak student improved academically when partnered with a more social partner.

Figure 9 displays results of improvement between the pre- and posttests with Group A results ranging from 36% to 76%, and Group B results ranging from 39% to 52%. The results of rising scores for both groups reduced the negative preconceived notion that inclusion students cannot be taught abstract mathematical concepts. Figure 10 indicates mastery of the course with the Group A mean grade of 2.9, equivalent to a C+, and readiness to take the state required California High School Exit Exam (CAHSEE). The CAHSEE results are not yet available for Group A or Group B students. The course

had to be repeated in a summer session due to failing grades for the majority of Group B students with a mean grade of 0.4, equivalent to an F. Group A students qualified to take the next CAHSEE, to be administered the following fall semester. Group B students will not qualify until the required grade of 1.0, equivalent to a D, is earned.

Question 3

What do skilled teachers who work with children do to successfully complete the teaching and learning process in getting the information from the teacher to the student?

Skilled professionals using imaginative techniques reached the levels of students using ranges of strengths in nine areas of capabilities and perceptions learned from the Multiple Intelligence Inventory responses from the students, displayed in chapter 4 Figure 7 (see the list following question 1) . For example, Group A teachers recognized that not all students are able to read the textbook due to an identified learning disability in reading, but that students who easily navigate the text can be partnered with a student needing reading assistance. Group A teachers recognized that some students prefer to work independently, thus not all students are required to work with a partner. Other examples of imaginative techniques reported from trained teachers included allowing students a note taker so that the class lectures are recorded on NCR (carbonless) paper for future reference to take home for aide with homework. Students with organizational problems are allowed to store folders in the classroom so that items will not be misplaced when needed for future reference. Students with disabilities in the area of spatial relations are allowed to work on a larger format than the standard 8 ½ x 11-size paper. Students who find it difficult to participate in class are allowed to demonstrate participation in an

after school setting with fewer students where participation is less threatening. Students are allowed to tape record class sessions to aide with homework, as short-term memory problems may interfere with what was presented in class being forgotten by the time it is needed for homework. Computer software is accessible to enhance review, numbers are reduced on assignments, testing environments are altered for less distractibility, and curriculum is altered to match the strengths of the students, rather than calling attention to student weaknesses.

The data collected from the teacher survey from questions 1 and 5, found in chapter 4 Figure 8, indicated with 5s, strongly agree, that there is a high interest of most professionals to successfully reach and teach the various levels of learners. The observation rubric cited examples of how teachers altered the curriculum to reach the strengths of the students. One teacher described teaching the concept of surveys, recognizing the strengths of the kinesthetic abilities of the students. After a brief presentation in the classroom where surveys were prepared and discussed, the students were sent in groups to various departments around the campus. The teacher had prearranged a visit from the students with the district office, administration, and the science department thus preparing the interviewers and the interviewees. Another teacher used a contest to generate a competition between the classes for 100% of homework assignments, a positive goal, instead of penalizing for missing homework assignments.

Successful teaching methods are reflected as a result of the Algebra 1 course preparation for the California High School Exit Exam (CAHSEE), displayed in chapter 4 Figure 9 with the comparison mean scores from pre- and posttests: Group A results

ranging from 36% to 76%, and Group B results ranging from 39% to 52%. The semester grades reflected mastery of concepts and are displayed in chapter 4 Figure 10, with the Group A mean grade of 2.9, equivalent to a C+, and Group B with a mean grade of 0.4, equivalent to an F. The discrepant information that affected the outcomes of pre- and posttest scores and semester grades is not reflected in the figures, but found at the beginning of the results section of chapter 4.

Question 4

How will special educations inclusion students in California gain advantages for academic success, when taught by teachers with training to recognize and incorporate individual differences into the mainstream curriculum?

The results of the data presented in chapter 4 Figures 7—10 reflect the academic success of inclusion students when teacher training is incorporated into the mainstream curriculum through teacher training programs. Advantages for academic success are readily apparent as data from Group A, the trained teachers' group, were collected, triangulated, and cross-referenced from the student responses from the Multiple Intelligences online inventory, the teacher responses from the survey, the handwritten anecdotal observations from the rubric, and the test scores and grades. The most obvious advantage for academic success is reflected in the passing grade of Group A students which indicates readiness for the California High School Exit Exam (CAHSEE). Other advantages include eligibility to qualify for extra curricular school activities in the areas of sports, student government, field trips, dances, pep squads, band, and school clubs.

Social advantages gained from academic success are vital to adolescent autonomy, leading to successful development through the stages into adulthood (Gardner, 2006).

Advantages can be seen in the positive themes found in chapter 4 Figure 6, which were gleaned from the results when the matrix of ranges was created from the data collection. Figure 7 data indicated that despite placement in the special education program, all students possess areas of strengths, a definite advantage that can be utilized to alter and adapt curriculum when recognized by trained teachers. Figure 8 data indicated there is a strong propensity for teacher willingness to accept that students can learn, an advantage that is reflected when Group A teachers report special education student academic success in the mainstream environment. Figures 9 and 10 reflect the academic success for the levels of learners, in and out of the special education program, recognized through the cross-referencing of collected data from pre- and posttests and semester grades.

Summary

Tables 1, 2, and 3 present the processes in the research study by which the data were generated, gathered, and recorded from the participants. Figures 7, 8, 9, and 10 display the collected data in various formats, and when examined collectively with the nonconfirming data, the results verify a cross-referencing of emerging understanding regarding the purpose of the study. The purpose of the quasiexperimental qualitative collective case study was to examine the relationship between teacher training and student academic performance to determine if there was a difference in the academic

success of special education inclusion students when their teachers do or do not have training.

The data findings were organized by ranges and themes as applicable to the research questions and stated throughout chapter 4 in categories of a positive or a negative theme, supported by data displayed in Figures 7—10. The effects of the discrepant information were discussed, as the data may have been skewed due to the information found on the student Individualized Educational Program (IEP) and semester schedule. The researcher and the special education district director discussed where the effects of the data may have an impact, concluding that the data findings may be misconstrued if all of the data were not included as evidence to ensure the quality of the research.

As a result of triangulation, members checking, and consultation for trustworthiness, the evidence of quality is assured. Appropriate evidence appears in the appendixes that include a sample student inventory, teacher survey, observation rubric, and pre- and posttests. Semester grade criteria were based on school district policy.

The culmination of the study to determine if there was a difference in the academic success of special education inclusion students when their teachers do or do not have training is reported in chapter 5. The social significance of the study is addressed and recommendations are discussed and justified through the design and analysis of the study.

CHAPTER 5: CONCLUSIONS, RECOMMENDATIONS, AND SUMMARY

Overview

The narrative focus of chapter 5 concludes the research study. An interpretation of the patterns, relationships, and themes from the outcomes in chapter 4 are reported as a result of the collected data. Following a brief overview, the remaining sections include (a) a discussion of the results organized according to the questions, (b) an interpretation of the findings, (c) implications for social change, (d) recommendations for action, (e) recommendations for further study, (f) researcher reflections, and (g) a conclusion.

The mainstreaming of special education inclusion students into the regular education environment was the phenomenon observed in the research study. Regular education classroom teachers faced with an influx of students with alternate learning styles struggled with current curriculum perceived to be inadaptable to the special education student styles of learning (Snowden, 2003)—the unobserved processes. Rosenberg (2000) explains that the unobserved processes are identified from observable phenomenon, which in turn tests theories (p. 103).

Teachers, perplexed with the changes in the regular education mainstream environment, asked for training to adjust to the mandates of inclusion student laws (Cauley, Linder & McMillan, 2001). The teachers, bounded by the legalities of the least restrictive environment clause listed on the special education student Individualized Educational Program (IEP), did not fully understand how to teach the special education inclusion students. Not enough was known of the effects of teacher training on student

academic achievement because teacher training studies were missing from the empirical evidence. The research study adds a missing dimension to the current body of available scholarly literature.

The basic structure using the theories of Vygotsky (1962) and Gardner (1983, 1993) as the theoretical framework of the study, allows for inferences to be made from previous research to support the need for teacher training. Exploring teacher training effects on the academic performance of special education inclusion students in the mainstream environment was the goal of the study, resulting in promoting and developing an increased capacity for the academic success of the levels of learners, the conclusion that tests the theory (Rosenberg, 2000). The study was designed to help skilled classroom teachers better understand what is necessary to become more effective professional developers working with special education inclusion students currently programmed into regular education classrooms. Empirical evidence revealed that teacher training was frequently requested by credentialed professionals, untrained to teach special education students (Celetti, 1999; Nguyen, 2002; Snowden, 2003). Unfortunately, studies examining student academic outcomes in relationship to teacher training were overshadowed by regular education legislative reforms. Political, social, and economic decisions tend to reveal numerous pieces of legislation that negate each other, creating chaos in the education system (Bui, Deshler, Schumaker, & Vernon, 2000). Critical qualitative research examining the effects of teacher training warranted questioning the status quo of the environment of school systems that reflected a need for social change.

Discussion of Results

The results of the research study aid to fill the gaps in the literature regarding teacher training. The findings of the study suggest that more trained teachers for individual styles of learning will narrow the gap between special education and regular education through a mutual understanding of multiple learning styles. The data serve to generate discussions that redefine policy decisions for funding teacher training programs. The students, in and out of special education, profited from the research that established a need for teacher training.

A quasiexperimental collective case study provided the framework to examine the relationship between teacher training and student academic performance, bounded by the evidence collected. The extreme case sampling strategy was implemented to collect data from a selected group of students, with the use of additional strategies of members checking, peer review, and triangulation to ensure the quality of evidence for replication. The synthesis of the data followed a cross-case analysis (Johnson & Christensen, 2003), utilized the Aydin and Oztutuncu (2001) study as an example, and added depth by including multiple data collection sources. Data collection instruments included an online student multiple intelligence inventory, a teacher survey and observation rubric, pre- and posttest scores, and semester grades. The following research questions were asked, and the outcomes from the collection of data presented in chapter 4 provide the conclusions that apply to each question.

1. How will teacher training for individual differences affect the academic performance of special education inclusion students?

The academic performance of special education inclusion students enrolled in classes with trained teachers showed marked improvement from the collected data using five sources. First, the multiple intelligence inventory results revealed that all students, in or out of special education programs, have areas of strengths for learning found in chapter 4 Figure 7. Second, the teacher survey found in chapter 4 Figure 8 responses were tallied for (a) previous training, (b) the academic success of the students once the training was implemented, and (c) information suggesting future training. Figure 8 results for academic success were noted through teacher responses that indicated students improved when curriculum was altered, once teacher training was implemented.

The third source of collected data came from the individual observation rubric that revealed improved student performance recorded through teacher anecdotal records. Hand written descriptions were divided into positive and negative themes. The positive themes included student interest in hands-on curriculum, increased use of computer technology utilized for homework help and review, and student success using alternate forms of assessment. Negative themes, included to ensure the quality of evidence by providing a balanced report of the study outcomes, were drop out rate, low or failing grades, ditching class, weaknesses, tutoring needs.

The fourth source of collected data, the mean pre- and posttest scores in chapter 4 Figure 9, revealed a 40-point academic improvement for the students with a trained teacher. The students with the untrained teacher improved, but not enough to earn a successful passing grade. The fifth and last measure of academic performance displayed in chapter 4 Figure 10 shows the mean semester grades. The group of students with the

trained teachers, Group A, earned a mean passing grade of 2.9, equivalent to a C. The students with the untrained teachers, Group B, did not receive a grade high enough to pass the required course. The .4 mean grade equivalent was .6 under the required D.

2. What effects will teacher training have in regards to the inclusion of the various levels of learners in the mainstream environment?

In regards to the inclusion of the levels of learners in the mainstream environment, the outlook for teacher training was positive, revealed from the data collection compilations. Specifically, the multiple intelligence inventory of student responses indicated that all students have strengths, regardless of special education placement. The collected teacher survey data supported future teacher training programs with an overwhelming positive response of 100% when asked if training were offered would the teachers participate. The rubric of teacher observations revealed positive patterns with teachers citing examples of previous negativity towards inclusion students before training. Negativity was eliminated as a result of teacher training in regards to the inclusion of the various levels of learners in the mainstream environment.

Positive comments as a result of teacher training reflect that, “training provided a deeper understanding of why students sometimes cannot learn unless curriculum is altered.” Negative patterns were coded and recorded to include all the data as evidence to ensure the quality of the research, listed in chapter 4. Figures 9 and 10 display the improved pre- and posttest scores and the improved semester grades with the trained teacher, providing educators with concrete examples, listed in chapter 4, of how trained

teachers eliminated negative patterns in regards to the inclusion of the various levels of learners in the mainstream environment.

3. What do skilled teachers do to successfully complete the teaching and learning process in getting the information from the teacher to the student?

The data collection to address what skilled teachers do to complete the teaching and learning process was obtained from the hand written teacher records for individual students. Teachers recorded examples of success through the use of group projects, hands-on curriculum, peer reviews to check homework, and interactive assignments. Increased support was cited from tutorial or support classes offered through the special education department as a positive outcome. Alternate forms of assessment were the serendipitous results, with examples written out to explain the process. Portfolio assessment was a successful example collected from the teachers, with the teachers providing realia by submitting the student portfolios. Examples of unsuccessful influential factors with individual students collected and listed in chapter 4 in the category of negative themes included drop out rates, attendance problems, problems with substance abuse, and unsupported family interventions.

4. How will special educations inclusion students in California gain advantages for academic success when taught by teachers with training to recognize and incorporate individual differences into the mainstream curriculum?

The mean scores and semester grades displayed in chapter 4 Figures 9 and 10 reflect the most significant advantages for academic success for special education inclusion students, that of the qualification for academic readiness to take the California

High School Exit Exam (CAHSEE). Each table reflects passing scores of the special education inclusion students taught by trained teachers in the mainstream courses for the state requirement in California to successfully complete an Algebra 1 course in preparation for the California High School Exit Exam (CAHSEE). The scores that reflect unsuccessful academic success are also displayed in Figures 9 and 10, included for a balanced review of the study as evidence to ensure the quality of the research.

Interpretation of the Findings

The research study examined special education inclusion student performance and academic achievement in mainstream classes in relationship to teacher training. The research methodology for the study, presented in chapter 3, followed a plan similar to the Kaplan, D., Kaplan, H., & Lui (2001) study that examined educational expectations and student academic achievement. The schematic in chapter 3 Figure 2 was developed by the researcher to better understand the how and why of the research methodology for the 2001 study. In the process of developing the schematic, the researcher found that further study examining educational expectations was suggested regarding student academic achievement.

An in-depth exploration of the problematic conditions of mainstreaming students in education took place, and the need for teacher training became acutely apparent in regards to special education inclusion students. A tentative presumption was formed by the researcher: students can learn regardless of alternative learning styles (Gardner, 1983, 1993, 2006; Vygotsky, 1962) if teacher training was incorporated into school systems. The schematic formulated by the researcher and found in chapter 5 Figure 11 displays the

inductive process of the research study providing a theory that specifically answers question 1, how will teacher training for individual differences affect the academic performance of special education inclusion students?

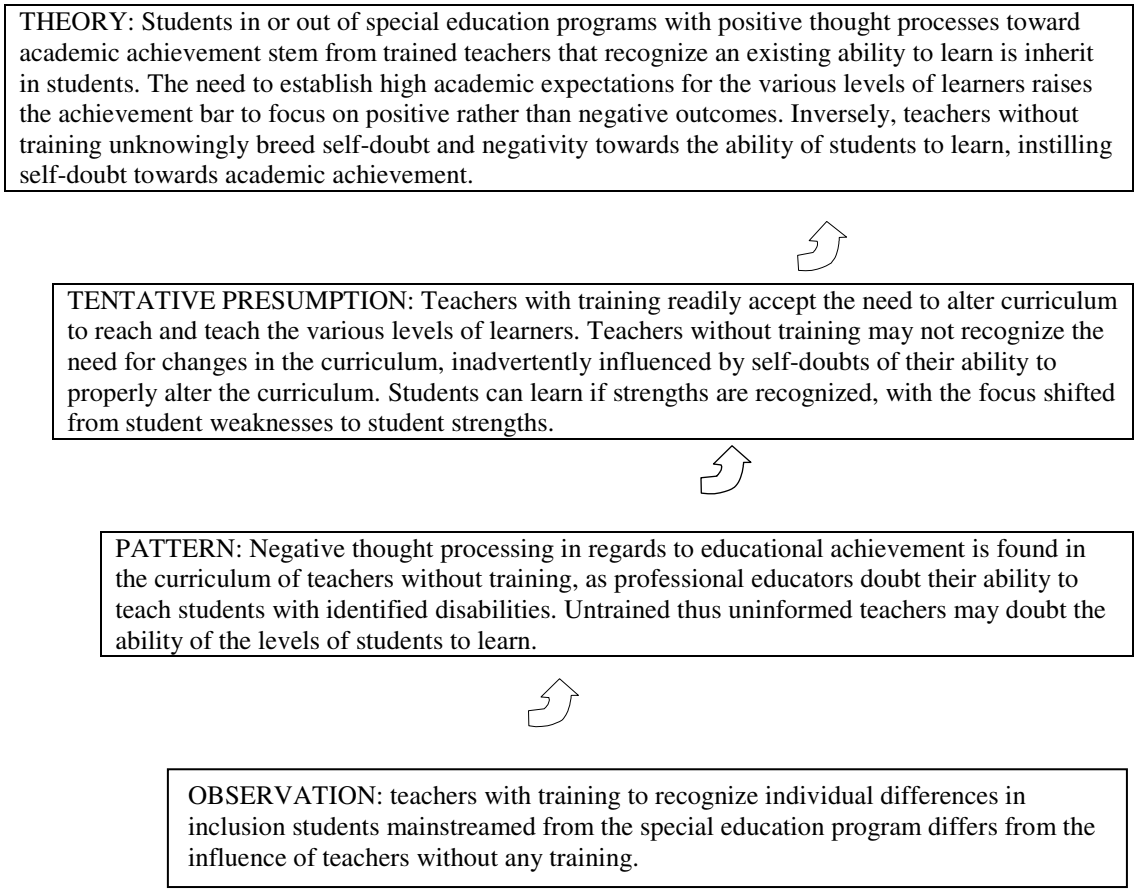


Figure 11. An inductive schematic B of educational expectations and academic achievements based on the Kaplan, D., Kaplan, H., and Liu (2003) study provides a guideline for the research study described in chapter 1 and outlined in chapter 3: The effects of teacher training for individual differences to improve the academic performance of special education inclusion students

The inductive process started with researcher observations of inclusion students mainstreamed into the regular education environment over a 2-decade time period as described in chapter 1. A negative pattern detected from the scholarly literature (Celetti, 1999; Nguyen, 2002; Snowden, 2003) confirmed the observations, including teacher self doubt of the ability to teach inclusion students. Armed with no more than basic courses for beginning teachers, the mainstream teachers voiced a lack of confidence reflecting a universal theme of negativity towards special education student academic achievement (Celetti, 1999). The presumptions formulated by the researcher supports the theory concluded through the data collection procedure outlined in chapter 3 and found in the outcomes of chapter 4, found specifically in chapter 5 Figure 11 with details on the schematic of the study.

Learning, a human process for storing information, was the apex of life according to the early Greeks, Plato, and Aristotle. Students possess capabilities to learn, even if educators do not fully understand the learning styles of the levels of learners. The logical and linguistic teaching/learning styles that currently dominate teaching/learning environments create a learning void for students that use a style outside of the common didactical mode of teaching (Gardner, 1999; Senge, 2000).

Alternate styles of teaching/learning, in proper balance with societal demands for 21st century self-starters and independent thinkers, require training necessary to meet the needs of the levels of learners. Schools are based in linear curriculum presentation, but students are in need of flexible nonlinear teaching styles. The outcomes from chapter 4 figures, tables, and summaries specifically addressed question 2, what effects teacher

training will have in regards to the inclusion of the various levels of learners in the mainstream environment. Results indicated that teacher training supports an understanding of multiple styles of learning applicable to nonlinear teaching including mainstream learners.

The empirical evidence and research about learning outlined in chapter 2 has emerged in cognitive science (Askenazy, 2000; Gardner, 1983; Lavoie, 1989, 2005; Levine, 1995; Masters & McGuire, 1994), but schools have not translated the information to teacher training programs or curricula (Gardner, 1983, 1993, 2006; Senge et al., 2003). Teacher training is in need of revision to incorporate programs that help skilled classroom teachers to understand what is necessary to become more effective professional developers working with special education inclusion students programmed into regular education classrooms.

Specifically addressing question 3, what skilled teachers do who work with children to successfully complete the teaching and learning process in getting the information from the teacher to the student, the trained teacher responses reflect changes in programs, processes, and curriculum. The changes have been adopted as a result of training for individual differences in regards to the mainstream special education inclusion students. The anecdotal notes and the teacher survey responses included the following examples of program changes that will help skilled classroom teachers to understand what is necessary to become more effective professional developers working with special education inclusion students programmed into regular education classrooms: group activity, peer reviews, hands-on curriculum, paring students with partners for

social and academic support; recognition of problems with reading the textbook, recognizing that some students prefer to work independently, thus not requiring all students to work with a partner.

Question 4 asks how special educations inclusion students in California will gain advantages for academic success when taught by teachers with training to recognize and incorporate individual differences into the mainstream curriculum, and examples of advantages for academic success were reported from trained teachers. Examples included allowing students a note taker so that the class lectures are recorded on NCR (carbonless) paper for future reference to take home for aide with homework; allowing students with organizational problems to store folders in the classroom so that items will not be misplaced when needed for future reference; allowing students with disabilities in the area of spatial relations to work on a larger format than the standard 8 ½ x 11-size paper; allowing students who find it difficult to participate in class other avenues for participation such as an after school setting with fewer students where participation is less threatening; allowing students to tape record class sessions to aide with homework; keeping computer software accessible to enhance review; reducing the expected numbers on assignments, homework, and testing to accommodate the delayed processing skills. By altering the classroom environment for the least distractibility, and altering the curriculum to match the strengths of the students, rather than calling attention to student weaknesses, teachers will demonstrate skills learned from the examples of trained teachers. The ability to become more effective professional developers working with

special education inclusion students programmed into regular education classrooms is the goal of teachers asking for training for the last four decades.

The peer debriefing session to discuss the data collections included the researcher, the special education district director, and the mathematics department teachers to ensure the quality of the data. The results of the study were potentially impacted by three outlying variables, classified as discrepant finding. The first variable, whether mathematics is identified on the Individualized Education Program (IEP) of the student as an area of disability, was considered and supported with tutoring or a support class from the special education department when necessary. The second variable considered as a potential impact was whether the student had previously taken the Algebra 1 course and was repeating the course due to an unsuccessful attempt to receive a passing grade. The school required the students to repeat the course if a passing grade was not earned following the first attempt. The third variable under consideration was the degree of support the student received from the special education department either through study skills or tutorial courses, computer software programs, or other outside sources.

The data collected from the outlying variables were obtained from the student semester schedules and the Individualized Education Program (IEP), reported in the debriefing session, and recorded as discrepant and nonconfirming data in the findings. The researcher and the special education district director discussed where the effects of the data may have an impact, and concurred that the data findings may be misconstrued if all of the data were not included as evidence to ensure the quality of the research.

Implications for Social Change

Without taking risks social science is very limited in the ability to affect social change (Day, 2002, p. 9). If researchers "challenge the boundaries of what is acceptable writing and what it is acceptable to write about" (p. 3), the implications for social change become more powerful. Current pedagogical trends are in transition and school districts need to incorporate workshops, seminars, and in-service training sessions for individual learning styles to ease the transition process in converting mainstream teaching styles into adaptable curriculum for the various learning styles.

Social change and taking risks emerge together, experienced as the discoveries of the new millennium are fast forwarded at a pace that is difficult to keep. Social scientists continue conducting research for the betterment of society. In the implementation of social change, a coordinated effort for a "hybrid practice" (Field, 1991, p. 5) suggests a solution that bridges old practices with new to form an emerging paradigm: teaching the various levels of learners within a regular education environment. The outcomes of the study, presented in chapter 4, revealed specific examples that indicate trained teachers in the regular education environment are bridging old and new practices.

Positive social change for the school community resulted with the study which examined more closely what teacher training could do for the academic success of special education resource students currently taught by regular education teachers in need of training. Trained teachers are altering the current curriculum to accommodate the learning styles of the special education inclusion students to ensure academic success as seen in chapter 4 in Figure 8 where teacher responses of strongly agree are recorded.

Making changes is controversial and risky, setting a new bar for teachers seeking methods to reach and teach the learners in the mainstream environment. The positive impact on society felt from the study results diffused the uncertainty of whether teacher training had an effect on academic success, as stated in the significance section of chapter 1. The effects are positive, and the academic success is presented in Figures 9 and 10 of chapter 4 in the mean pre- and posttest scores indicating improvement, and passing semester grades of 2.9 for the students with the trained teachers from Group A.

Educational systems customarily focus on learners through the use of two intelligences, linguistic and logical. Gardner's multiple intelligence theory (1983, 1993) incorporates several types of learners, instilling a cry for a more balanced system of instruction that could benefit the majority of learners. Gardner's (2006) work continues to study multiple intelligence theory and education. "Much of the work my colleagues and I have undertaken in the past decade has examined educational implications of MI theory," (Gardner, 1993, p. xv). The theoretical framework for the study, based on the multiple intelligence theory, allowed for inferences to be made recognizing the need for teacher training to include all the intelligences beyond the two of linguistic and logical that currently exist in academia.

There was no direct educational implication in Gardner's psychological theory in 1983, but the implication for social change was imminent. The didactical system of teaching previously accepted as the only approach in educational institutions could virtually be changed forever, if the theory was accepted. Gardner focused his study of intelligence "on two assumptions: first, that it is better described in terms of a set of

abilities, talents, or mental skills and that, however defined, it cannot be measured by standardized verbal instruments, such as short answer, paper and pencil tests" (Gardner, 1993, p. 15). Inspired by the work of the Soviet psychologist Lev Vygotsky (1962) who espoused the zone of proximal development (ZPD) that relates learning to differences among the practices in cultures, Gardner recognized that various cultural experiences enhance the growing child. Classical theory (Vygotsky, 1962) was used by Cheyne (1999) to understand the contemporary needs of the various levels of learners (Gardner, 1993) within the mainstream environment with a compare and contrast format. Cheyne offered suggestions to affect social change in ways that educators may better perceive learner capabilities.

Cheyne's (1999) study linked the differences in cultural experience, family background, and history to cognitive capabilities and development in both male and female adolescents. Once the potential to learn is understood proper guidance to reach full cognitive potential blocks previous patterns of negativity and impulsivity. The Cheyne study results link to the research study outcomes in chapter 4. The study indicates that teachers, through the use of the multiple intelligence theory included in the training for variety in the potential to learn, provided successful changes in curriculum.

Affecting social change involves taking risks. School systems are stuck in a comfort zone, successful for some students, but not successful in providing the various levels of learners the opportunity to reach full academic potential. Affecting social change requires extra work from a system that is reluctant to accept change. Details can be found in the researcher reflections at the end of chapter 5 regarding school systems

and the reluctance to change in relationship to the study. Regular education and special education teachers are overworked and understaffed, but without change, student academic outcomes continue to be at risk.

Educators continue to face technological advances suggesting a paradigm shift for the new millennium. Workers including teachers and students in and out of the school system are required to be self-starters with abilities to think independently (Calvert, Conger, & Murray, 2004; Guskey, 1996). Dynamic ideas are needed to prepare learners for the changes ahead in individual socialization, with impacts affecting the cultural and historical differences in society. The Cheyne (1999) study examined internal and external thought processing and suggests alternate ideas for teaching methods in speech and language. If alternate learning styles are not clearly understood, will teachers be prepared to meet the demands of the 21st century? The outcomes of the study in chapter 4 clearly reflect that alternate learning styles are not currently understood, and the outcry from teachers for training is an urgent issue in need of social change.

The implications for social change in education depend on decisions that must be made politically, socially, and economically. Educators are sometimes forced to work backwards out of a chaotic system created by politicians uncommitted to the heart of the problems in teaching and learning. When budgets are cut and programs eliminated educators take what is offered by politically driven revenue to make the subsystems work. Changes in legislation make more demands on the regular education curriculum, often counter productive to the whole school system. As regular education legislation increases demands on teachers, the needs of the inclusion students are ignored, causing

the systems of support for the levels of learners to breakdown (Gardner, 1993; Senge, 1990). The study outcomes provided in chapter 4 indicate a breakdown in the school system, where support for teachers in need of training is virtually ignored due to regular education mandates that negate special education inclusion student needs. The academic achievements of the inclusion students in the mainstream environment are at risk in need of trained teachers to understand that students can learn in multiple modalities.

Alternate methods to current mainstream teaching and learning protocol support the need for the study as the demands of the new millennium require independent self-starters. Students can learn, and teachers deserve to be trained to understand the levels of learning. Without taking the risks to affect social change, students will not be prepared to meet the demands of the new millennium.

Recommendations for Action

Every person is created as a unique being with a potential in need of actualization. As the potential increases from 21st century demands, for students with or without learning disabilities, more integrated hands-on curriculum is needed. Recognizing the need for more integrated curriculum, the formulation of multiple intelligence as linguistic, logical, spatial, bodily kinesthetic, musical, interpersonal, intrapersonal, naturalistic, and existential strengths presents a more balanced holistic view of human characteristics (Gardner, 1983, 1993, 2006) and was used with Vygotsky's (1962) zone of proximal development to draw inferences for the study.

The findings from the collection, organization, and examination of the data results found in chapter 4 are useful to (a) administrators, (b) curriculum specialists, (c) resource

specialists, (d) regular education and special education teachers, (f) federal funding coordinators, (e) students, and (f) parents. The inventory of student responses and teacher survey responses, triangulated with the handwritten teacher observations, indicate a positive and a negative theme as organized in the matrix in Figure 6 of chapter 4. Details of the outcomes as to how teacher training affects the academic performance of the inclusion population of learners in regular mainstream classes provide evidence through the tables and summaries following each question in chapter 4, with a recommendation of steps to action below.

Step 1: School systems will find the research results useful through the examination of the findings that describe how the relationship between students, the school, and the teachers are more harmoniously balanced within the classrooms of the trained teacher. As a result of the data findings, the refocus of the academic performance of the levels of students should be a primary consideration, despite outside influences from standard based testing, multiple legislation, and family dysfunction. School administrators in a coordinated effort with department chairpersons may use the results to better understand how trained teachers present curriculum for successful academic results.

Step 2: The research data interpretation was used to predict future outcomes of inclusion student academic success (Johnson and Christensen, 2003, p. 79). Adapting the curriculum to reach and serve the levels of learners is supported through the research study results found in the figures, tables, and summaries in chapter 4. The future benefits for the majority of the levels of learners comes in the renewed perception that it is not as

difficult as once perceived through the eyes of regular education teachers to adapt the curriculum for the majority of the levels of learners. Teacher training programs may offer suggestions for improved classroom policy, where ideas for curriculum restructuring can be shared between peers, narrowing the gap between special education and regular education.

Step 3: The data and findings of the study serve to generate discussions that redefine policy decisions for funding teacher training programs to better understand how to teach students with individual differences currently enrolled in mainstream classrooms. The study examined the uncertainty of the effects of teacher training as a predictor of inclusion student academic outcomes when students are mainstreamed into the regular education curriculum. The outcomes in the figures, tables, and summaries of chapter 4 aid in filling the gaps in the literature, and support the use of adapted curriculum for teaching students with alternate learning styles. The multiple intelligence theory incorporates several types of learning styles, instilling a cry for a more balanced system of instruction that could benefit the majority of learners, funded through local and federal mandates.

Step 4: The possible impact on education is huge, providing the multiple intelligence theory is accepted. The didactical system of teaching previously accepted as the only approach in educational institutions could virtually be changed forever. For example, studies incorporating thought recognition (Kelley & Stack, 2000) and hands-on curriculum into teacher training (O'Neal, 2004) offer examples and new approaches to teaching Algebra (Thornton, 2001). Terms such as learning styles, alternate learning

styles, individual differences, and modes of learning are used interchangeably in the scholarly literature in reference to learning (History of Drake Institute, 2001; Askenazy, Benoit, Lecrubier, Lestideau, & Myquel, 2002; Carbone, 2003; Dreher, 2003; DuPaul, 1997; Gardner, 1983, 1993, 2006; Levine, 1995; Senge, 2000; Swinderek, 1997). Differences exist in human beings and the need to recognize the differences in the ways that learning transpires is an urgent need in learning organizations.

A key to success in teaching and learning is to recognize each child's most developed intelligence (Gardner, 1993). Laws to include special education students in the mainstream classes are mandated by the least restricted environment clause (Individuals with Disabilities Education Improvement Act [IDEA], 1965/2004), making it difficult to teach one set curriculum because students who learn in a variety of ways require accommodations. Understanding that there are different types of learning disabilities challenges educators in every classroom. Through the use of the multiple intelligence online inventory (McKenzie, 1999) to recognize individual differences, and to make connections between developed and undeveloped intelligences, teachers have new tools with which to recognize strengths and weaknesses.

Step 5: Research (Kelley & Stack, 2000) indicates that not only special education adolescents falter in the search for self-confidence. Sometime in life human beings are tempted and may cave into negative pressure from outside sources (Bandura, 1977), or from within their own personal individual thought processes. Skills can be taught to the majority of the levels of learners to control impulsive decision-making as Gardner's theory of multiple intelligence recognizes that there are nine areas in which learning can

take place (Gardner, 1993). Outside of the educational setting, the labels of special education no longer exist and the once labeled adolescents often thrive and prosper in the real world without the labels imposed from the school system.

Three distinct areas to consider from the Kelley and Stack (2000) study are: (a) Recognition of the intrinsic value of humanity born good and wholesome with the capacity to attain psychological health, (b) Two processes of thinking exist: process thinking (acquired ability) and free flowing thinking (innate source of profound human intelligence), and (c) Stress and distress are functions of the abuse of process thinking, causing innate thought processes to drift into an unhealthy pattern.

Step 6: The emotions, concerns, and desires of special education students to be like everyone else in society deserve consideration (Gardner, 1993; Lavoie, 2005). Assigning an acronym frequently associated with special education individuals: Attention Deficit Disorder (ADD), Attention Deficit with Hyperactivity Disorder (ADHD), or Learning Disabled (LD) is a quick fix method to label students with symptoms, but often fails to recognize the student as an individual human being. Eliminating the labeling system will improve unhealthy patterns of negative thought processes in reference to special education students needs. The research study observations demonstrate that individual recognition improves academic achievement.

The two styles of learning traditionally found in most facets of education, those of linguistic and logical intelligence (Gardner, 1993), no longer suffice in general education classrooms. Students identified with disabilities do not always respond using the two intelligences recognized with traditional teaching methodology. Special education

students are multi-talented outside the linguistic and logical intelligence styles in the areas of art, design, drafting, poetry writing, or music, but rarely have an opportunity to demonstrate their individual talent in a didactical setting. Frustration builds when creativity is stifled day after day, impulsive urges interrupt thought processes, and negativity results unless teachers keep in mind that students are *just kids* who want to learn, but do not always know how to reach their full potential. Teachers are asking for training, and school systems need to comply.

One-room special education classrooms no longer exist separate from the mainstream environment. The need to accommodate the socialization of the majority of students regardless of limitations in learning created a paradigm shift in special education in 1965 (IDEA, 2004), altering the program placement of mildly or moderately disabled students. In support of the change, classical theories in human development combined with contemporary research from social scientists revealed the need for studies that examined the socialization of the students into the newly integrated mainstream environment. Unfortunately, the academic outcomes of the students were overlooked due to the concentrated efforts of the studies on socialization. The research data produced outcomes that reflect more studies are needed to fill the gaps in the scholarly literature.

Recommendations for Further Study

Change is certain, but progress is not without social scientific researchers asking more questions. As a result of the qualitative study, the researcher discovered that the most up-to-date legislation continues to operate in a state of flux. Despite the myriad of laws enacted to protect the rights of special education students, more new laws in regular

education conflict, and as a result negate each other. Questions arose as a result of the collected data for the study, giving rise to ideas for further study that include (a) the civil rights of students, currently in and out of court cases, (b) requests to identify children for services from special education when disabilities do not warrant services, (c) student academic achievement related to family cohesiveness, (d) alternate assessment other than traditional IQ tests, (e) the functions of the central nervous system to understanding the relationship between adolescent impulsivity and the development of abstract cognition, and (f) serotonin and social behavior in relationship to the overuse of prescription drugs in school children.

In early 2006, the Office of Civil Rights (California Education Code, 2006) enacted new legislation to eliminate previous labels listed on the student Individualized Educational Program (IEP). Lawsuits that surfaced from federal mandates such as No Child Left Behind (NCLB) found that the civil rights of individual students may be in question. Closer examination into the civil rights of individual students continue surface in the court system. Further studies questioning if differential treatment exists if teachers are not properly trained naturally extends from the research findings, but more information is needed to check the validity and reliability of the results. For example, does differential treatment exist if a regular education teacher has not previously been made aware of styles of learning that differ from the mainstream student, and is then asked to successfully teach special education inclusion students where “a real impact on the life chances of individuals,” (Hatch, 2002, p. 16) is affected?

There is a need to teach children, parents, and caretakers of the normal processes of development which may slow down the urgency for requests to identify children for services from special education. As a result of the study by Kaplan, D., Kaplan, H., and Liu (2001) it was discovered that the cohesiveness of the family structure directly affects the adolescent developmental period related to learning and motivation. Families with close ties rely on each other, share problems and successes, thus leading to positive social and emotional adjustment. Inversely, families that lack togetherness tend to develop problems with children leading to depression and negative thought processing that affect learning and motivation.

The requirements for a healthy development of learning and motivation have a direct relationship to the physical and environmental factors that surround human beings, but there are additional factors to consider that play an integral part in intellectual development. When an environment in which the child lives is discovered to be unhealthy, physically or emotionally, a crisis exists, and the learning and motivation of the student is thwarted by the negative environment. While crises occur naturally as integral parts of the developmental periods, there is an urgent need for studies within the family structure to support at risk children so that successful learning and motivation naturally evolves as a priority. Future studies examining the relationship between family influence and learning and motivation are warranted.

Gardner's intelligence theory took into consideration the effects from genetics and environmental influences by culture, a concept shared by Bandura (1977) and Piaget (1965), creating differences in intellectual profiles. The Binet IQ test once considered the

norm for intelligence tests was questioned, as it was questioned by Piaget (1965). Regarding the IQ test scores, Gardner (1983, 1993) writes, “It does predict one’s ability to handle school subjects, though it foretells little of success in later life” (p. 3). Attempts to measure *raw* intelligence in the early development of the multiple intelligence theory became impossible, reflecting a shift in the philosophy of assessment.

Adolescents who score low on the IQ test due to struggles with educational, emotional, financial, cultural, or familial difficulties miss educational opportunities within the school environment. Further studies into alternate assessment outside of the traditional IQ test found in the school system are warranted. Exposure to solving the practical problems of the every day world offers a venue for success and happiness leading to the social development of comprehension and the decision-making process (Bandura, 1977; Gardner, 1993; Piaget, 1965). Unfortunately, the school system uses limited assessment techniques, thus limiting the success of the majority of the levels of learners.

Another opportunity for further study examines student success which may be lost if adolescent impulsivity blocks the social development of comprehension and the decision-making process, inside or outside of the school environment. Impulsive decisions interrupt the capacity to solve problems, leading to a developmental crisis (Erikson, 1950; Freud, 1933; Maslow, 1968). The crisis involves intelligence, according to Gardner’s (1993) definition of intelligence, “the capacity to solve problems . . .” (Introduction: 10th anniversary ed., p. x), and the *Merriam-Webster’s Collegiate Dictionary Eleventh Edition* (2003) definition, “the ability to learn or understand or to

deal with new or trying situations: reason" (p. 650). As adolescents encounter new or trying situations from the environment, the central nervous system attempts to process the crisis. Further studies into the functions of the central nervous system will aid in understanding the relationship between adolescent impulsivity and the development of abstract cognition.

Gardner (1993) argues, "Neurobiology research indicates that learning is an outcome of the modifications in the synaptic connections between cells. Various types of learning results in synaptic connections in different areas of the brain" (Introduction, p. x). The interesting chemical substance found in the brain in 1960 called serotonin has since found a relationship with neurotransmission, synapse connection, self-esteem, and adolescent impulsivity and decision-making. As interesting as the relationships of serotonin are, the studies are inconclusive. Not enough is known about serotonin, and future studies are necessary to support or negate the assumptions.

The neurotransmitter revolution studies of Masters and McGuire (1994) focus on serotonin and social behavior. Using brain research and informational processing examples of intelligence, cognition, and neurotransmitter research, serotonin is under considerable scrutiny as a possible connection to the signals in the brain across synapses that affect abstract thought processing. Contemporary social scientists consider gender, ethnicity, intelligence, and self-esteem as influential factors in adolescence related to the development of higher level thinking skills. Inconclusive results from social scientific research should not be used to base the use of prescription drugs for children struggling to achieve the development of abstract thought processing skills. "There may be as many

as one hundred different chemicals that act as neurotransmitters in the nervous system" (Masters & McGuire, 1994, p. 186), which may affect ideas for future studies of intelligence, learning, and motivation. Studies affecting the impact of serotonin and the relationship to social behavior are inconclusive, in need of continued scrutiny to stop the unnecessary use of prescription drugs when problems are misunderstood in education.

Researcher Reflections

In a perfect world, the systems of teaching and learning would validate the intrinsic worth of each and every child, recognizing the various levels of learning. Knowing that life does not evolve in a perfect world, educators must take the responsibility to teach the levels of learners within the classroom. As a result of federally mandated legislation students with identified learning disabilities are currently mainstreamed into the majority of classrooms nationwide (Nguyen, 2002; Snowden, 2003). The placement, assimilation, and assessment of students identified with learning disabilities in academia teeter on how fair the interpretations are enacted by legislators, and if justice is served to the levels of learners with the mandated policies within the educational setting.

Discovering the need for social change does not come without risks, but without teacher training to prepare educators for the changes, student academic outcomes may be at risk for decline. An understanding for the need to adapt curriculum to the students' abilities within the mainstream classroom environment will ease an enormous social issue facing educators. The differences between regular education student learning abilities and the abilities of students with identified disabilities remain a mystery to educators if

teacher training is not incorporated into workshops, seminars, or in-service programs. Educators need tools to teach self-reliance and management of learning and motivation to the various levels of students (Gardner, 1989). Although there are common patterns in human learning, each human being develops in a unique way at an individual rate. It is up to caretakers, educators, and parents to discover and explore the uniqueness of each individual.

Students do not come prepackaged, and are not always able to respond to one successful procedure, so the need to incorporate accommodations is urgent to combat negative teaching/learning patterns in schools. Impulsivity, hyperactivity, disorganization, inattention, and distractibility can be minimized by concentrating on student strengths. Despite the confusion that often accompanies an accurate identification of a student's learning disability, students deserve the right to the best educational opportunities. A learning disability does not diminish the individuality of a human being capable of intellectual growth and the potential for learning and motivational development (Winebrenner, 1996).

Evaluation, assessment, or placement should not be clouded by skin color, hair color, style, cultural differences, language, disabilities, trendy generational phases, or even *attitudes,* "learning disabled (LD) children tend to have poorly developed problem-solving skills and, as a result, they tend to resolve conflicts by using aggression rather than negotiation" (Lavoie, 2005, p. 3). Limitations due to placement in the special education program with Individualized Educational Program (IEP) requirements place an additional spotlight on students in the mainstream classroom environment. Desperately

wanting to fit into a peer-approved group (Lavoie, 2005), adolescents act without thinking so as to blend in with their peers. Negative consequences sometimes result, as the negative theme of the matrix in Figure 6 of chapter 4 reveals. If impulsivity leads to a negative decision, then control is lacking which may be due to an immature development of the learning process, and not the need for special education services.

Long-term illnesses, drug rehabilitation programs, suspensions, or expulsions can create learning gaps. Rather than be recognized for gaps in learning, students choose to attract negative attention for impulsive actions and reactions that deters the attention away from a learning gap. The need to be accepted by peers is the ultimate goal in adolescent autonomy (Erikson, 1950; Lavoie, 2005), so taking impulsive risks outweighs the negative consequences for the adolescent.

Howard Gardener's theory of multiple intelligence (1983, 1993) recognizes seven areas of intelligence to consider in developing curriculum for the various levels of learners. The realization that current classroom curricular practices can be easily adapted to reach the various levels of students by using classical and contemporary theory guidelines offers more opportunity for the students to reach full learning potential. The hidden advantage to any changes in current curriculum to accommodate students with learning styles outside the accepted norm supports the regular student population by providing more enriched environmental experiences. The multiple intelligence theory incorporates several types of learning styles, instilling a cry for a more balanced system of instruction that could benefit the various types of learners.

As a result of the study, the researcher affirmed a previous belief that if parents, caretakers, and educators take the time to reach and teach the majority of the levels of learners a stronger grip on the future of society prevails, if social change is embraced. Social scientists take a risk with acquired learning, as Kegan (1983) states, "at helping us to see better what it is that people are doing, what the eye sees better the heart feels more deeply" (p. 16). Through the generation of social change, society must recognize that students at the various levels of learning are in need of direction and guidance.

Conducting a research study allowed the researcher to better understand that school systems in general are operated as a business that has not kept pace with 21st century business practices. Outside influences from economic, political, and social decisions often negate policies that are in the best interests of the clients of the business of the school system, the students. The students under scrutiny in the study, the special education inclusion mainstreamed students, do not have a voice in the big business of the school system.

Special education teachers and staff are overworked and understaffed, coordinating myriad clerical duties to process federal mandates, racing from classroom to classroom to support the efforts of the regular education teachers. The majority of teachers are willing to accept any support available to reach and teach students not able to cope with current curriculum standards. The outcry of teachers for training to become better professionals to work with the mainstreamed students is lost amid a flood of standardized testing to meet state standards that feed political platforms. A coordinated effort of (a) administrators, (b) curriculum specialists, (c) resource specialists, (d) regular

education and special education teachers, (f) federal funding coordinators, (e) school psychologists, and (f) parents to examine the study results may affect social changes to political, economic, and social policies. The special education student population needs a louder voice in the big business of the school system because the current system fails to recognize the needs of the majority of the levels of learners.

Summary

In 1964 government intervention raised awareness to the needs of students with disabilities, but a greater impact on the systems in education was felt in 1975 when the first Individuals with Disabilities Education Act (IDEA) was adopted (California Education Code, 2006). The Individualized Educational Program (IEP) for special education inclusion students, a legally binding document, began the enforcement of the least restrictive environment in 1983, directly affecting every classroom teacher. Consideration for teacher preparation and the impact on the academic achievement of the mainstreamed students were overlooked. The socialization needs of students with disabilities were met, but a gaping hole in academic achievement was left unresolved.

Despite enacted legislation to include special education students in the mainstream environment, the students in the special education inclusion program, enrolled in regular education classes, were not receiving the needed interventions and accommodations to succeed. Typical pedagogical practices used in regular education classrooms were challenged as teachers began to doubt their own teaching ability, and the ability of the inclusion student to learn. As a result, special education inclusion student academic outcomes were left at risk for decline.

Special education inclusion students have the capacity to learn, albeit sometimes with an alternate learning style. The need for teacher training is acutely apparent, recognized by teachers asking for training. Regular education classroom teachers currently face an influx of students with learning styles that create challenges to typical pedagogical practices. An understanding of the concepts of alternate styles of learning will serve regular education students as well as the special education population of learners. Without teacher training to prepare educators for changes within the classroom, teachers may fear inclusion students' style of learning, doubting their ability to learn.

When special education inclusion students were enrolled in the mainstream classes, teachers recognized the need to be trained. Teachers understood that to become effective professionals more training beyond basis courses provided for all beginning educators was necessary to balance teaching styles and learning capabilities of the majority of students. Teacher training requests are stifled by political, economic, and social decisions imposed by society often negating each other. The outcry of teachers for training has been virtually ignored for 24 years. The study was designed to help skilled classroom teachers better understand what is necessary to become more effective professional developers working with special education inclusion students programmed into regular education classes. The evidence offered in the study serves to demonstrate the academic achievement of special education inclusion students in regular education classrooms with untrained teachers is an urgent social issue in need of resolutions.

REFERENCES

Albers, L. (2001). *The handbook on psychiatric drugs.* New York: Holt.

Alternative Treatment Approaches for ADHD. (2001). *ADHD the online community*. Retrieved on 12/01/2005 from http://www.chadd.org/Content/CHADD/Understanding/TermstoKnow/default

American Psychological Association. (2001). *Publication manual of the American Psychological Association* (5th ed.). Washington, DC: Author.

Askenazy, F. (2000). Relationship between impulsivity and platelet serotonin content in adolescents. *Psychiatry Res*, *94*(1), 19-28.

Askenazy, F., Benoit, M., Lecrubier, Y., Lestideau, K., & Myquel, M. (2002). Anxiety and impulsivity levels identify relevant subtypes in adolescents with at-risk behavior. *Journal of Affective Disorders 74*: 219-227.

Aydin, B., & Oztutuncu, F. (2001). Examination of adolescents' negative thought, depressive mood, and family environment. *Adolescence, 36*(141), 77.

Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, NJ: Prentice-Hall.

Barbetti, V., Barriga, A., Doran, J., Newell, S., Morrison, E., & Robbins, B. (2002). Relationships between problem behaviors and academic achievement in adolescents: The unique role of attention problems. *Journal of Emotional and Behavioral Disorders, 10,* 233-240.

Bednar, D., & Fisher, T. (2003). Peer referencing in adolescent decision making as a function of perceived parenting style. *Adolescence, 38*(152), 607-622.

Bertalanffy, L. (1967). *Robots, men, and minds*. New York: G. Braziller.

Bertalanffy, L. (1968). G*eneral system theory: Foundations, development, applications* (Rev. ed.). New York: G. Braziller.

Bolland, J. (2001). In search of a few hundred good kids: Three months in the life of a community-based survey research study. *Families in Society: The Journal of Contemporary Human Services, 82,* 79-109.

Bonny, A., Britto, M., Hornung, R., Klostermann, B., & Slap, G. (2000). School disconnectedness: Identifying adolescents at risk. *American Academy of Pediatrics, 106,* 1017-1029.

Bui, Y., Deshler, D., Schumaker, J., & Vernon, D. (2000). Promoting success in the general education curriculum for high school students with disabilities: The context as a whole. *Research Synthesis Series: Institute for Academic Success*, 1-24.

California Education Code. (2006). Retrieved 05/01/2005 from caselaw.lp.findlaw.com/cacodes/edc.html

Calvert, S., Conger, E., & Murray, K. (2004). Heroic DVD portrayals: What US and Taiwanese adolescents admire and understand. *Applied Developmental Psychology*, *25*, 699-716

Campbell, D. T., & Stanley, J. C. (1963). *Experimental and quasiexperimental designs for research.* Chicago: Rand McNally College Publishing.

Capra, F. (1996). *The web of life: A new scientific understanding of living systems.* New York: Anchor Books.

Carbone, E. (2003). Arranging the classroom with an eye (and ear) to students with ADHD. *Teaching Exceptional Children*, *34*(2), 72-81.

Cauley, K., Linder, F., & McMillan, J. (Eds.) (2001). *Annual Editions: Educational Psychology*, 01/02 (16th Ed). Guilford, CT: McGraw Hill.

Celletti, J. (1999). General education teacher' perceptions of their preparation to work with special education. (Doctoral dissertation, University of Sarasota, 1999). ProQuest Information and Learning Company, (UMI No. 9936691)

Cheyne, J. (1999). Dialogue, difference, and the "Third Voice" in the zone of proximal development. *Theory and Psychology*, *9*, 5-28.

Cole, P. (1994). Finding a path through the research maze. *The qualitative reporter. 2*(1), 1-5.

Craver, S., & Ozmon, H. (1999). *Philosophical foundations of education*. Upper Saddle River, NJ: Merrill, Prentice Hall.

Creswell, J. W. (1998). *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks, CA: Sage.

Creswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed methods approaches* (2nd ed.). Thousand Oaks, CA: Sage.

Cronin, J., Houser, C., Houser, R., Kingsbury, G., & Olson, A. (2003). The state of state standards: Research investigating proficiency levels in fourteen states. *Northwestern Evaluation Association, Research Brief*, 1-31.

Darling, N. (2000). Relationships outside the family: Unrelated adults. Department of Human Development; Cornell University, Ithaca, NY, written for *Blackwell Encyclopedia of Adolescence.*

Davey, L., & Neill, M. (1991). The case against the national test. *Practical Assessment, Research & Evaluation.* Retrieved 05/01/2005 from http://PAREonline.net.getvn.asp?v=1&n=10

Day, E. (2002). Me, my*self and I: Personal and professional re-constructions in ethnographic research. *Forum Qualitative Social Research*, *3*(3).

Delevan, S. (2003). *Writing the proposal: An overview*. Unpublished manuscript, Walden University, Minneapolis, MN.

Dembo, M. (1994). *Applying educational psychology* (5th ed.). New York: Longman.

Dobson, J. (1982). *The strong-willed child*. Illinois: Tyndale House.

Dreher, N. (2003). Anger: it can be frightening: you need to know how to recognize and deal with anger before it becomes rage. *Current Health 2, Weekly Reader*, *29*(8), 20-23.

DuPaul, G. (1997). Teacher ratings of attention deficit hyperactivity disorder symptoms: Factor and normative data. *Psychological Assessment*, *9*(4), 436-444.

Echternacht, G. (1989). Interpreting test scores for compensatory education students. *Practical Assessment, Research & Evaluation.* Retrieved 05/01/2005 from http://PAREonline.net.getvn.asp?v=1&n=10

Erikson, E. (1950). *Childhood and society*. New York: Norton.

Essau, C. (2004). Risk taking behavior among German adolescents. *Journal of Youth Studies*, *7*(4), 499-512.

Feden, P. (2006). On balance: Fiction high school: Where things have to make sense. *Educational Horizons*, *84*, 79-85.

Feingold, B. (1975). *Why your child is hyperactive.* New York: Random House.

Fessler, D. (2001). Emotions and cost benefit assessment: The role of shame and self-esteem in risk taking. *US: The MIT Press*, 191-214.

Field, J. (1991). Questions about research that make a difference. *Convergence*, *24*(3), 71-79.

Fink, A., & Kosecoff, J. (1998). *How to conduct surveys: A step-by-step guide*. Thousand Oaks CA: Sage.

Freud, S. (1933). *New introductory lectures on psycho-analysis*. New York: Norton.

Funderstanding. (2001). Learning styles. *Chicago State University: Teachers' Writing & Resource Center*, ED 111. Retrieved 07/20/2006 from http://www.funderstanding.com/learning_styles.cfm

Free Appropriate Public Education (FAPE) online. (2006). Retrieved 07/20/2006 from http://www.fapeonline.org/terms.htm

Gardner, H. (1983). *Frames of mind*. New York: Basic Books.

Gardner, H. (1993). *Frames of mind: The theory of multiple intelligences* (Tenth anniversary edition). New York: Basic Books.

Gardner, H. (1999). *Intelligence reframed: Multiple intelligences for the 21st century*. New York: Basic Books.

Gardner, H. (2006). *Multiple intelligences: New horizons*. New York: Basic Books.

Gerrard, M., Gibbons, F., Reis-Bergan, M., & Russell, D. (2000). Self-esteem, self-serving cognitions, and health risk behavior. *Journal of Personality*, *68*(6), 1177-1201.

Green, S. B., & Salkind, N. J. (2005). *Using SPSS for Windows and Macintosh: Analyzing and understanding data* (4th ed.). Upper Saddle River, NJ: Pearson Prentice-Hall.

Guskey, T. (1996). Reporting on student learning: Lessons for the past—prescriptions for the future. *Association for Supervision and Curriculum Development*, 13-22.

Hancock, L. (1996). Mother's little helper. *Newsweek,* 51-56.

Hatch, J. (2002). *Doing qualitative research in educational settings*. Albany: State University of New York Press.

History of Drake Institute. (2001). *Drake Institute*. Retrieved 04/20/2002 from http:drakeinstitute.com

Huberman, M., & Miles, M. (1994). *Qualitative data analysis*. Thousand Oaks, CA: Sage.

Hunkins, F., & Ornstein, A. (1998). *Curriculum foundations, principles, and issues* (3rd ed.). Boston, MA: Allyn and Bacon.

Individuals with Disabilities Education Improvement Act of 2004 (IDEA). (2004). Retrieved 05/01/2006 from http://www.ed.gov/policy/speced/guid/idea/idea2004.html

Janesick, V. J. (2004). *Stretching exercises for qualitative researchers*. (2nd ed). Thousand Oaks, CA: Sage.

Johnson, B., & Christensen, L. (2003). *Educational research: Quantitative and qualitative approaches* (Research ed.). Boston: Allyn & Bacon.

Kaplan, D., Kaplan, H., & Liu, X. (2001). Influence of parent's self- feelings and expectations on children's academic performance. *Journal of Educational Research, 94*, 360. Retrieved October 4, 2004, from Academic Search Premier database (5032139).

Kegan, R. (1983). *The evolving self: problems and process in human development*. Cambridge, MA: Harvard University Press.

Kelley, T., & Stack, S. (2000). Thought recognition, locus of control, and adolescent well-being. *Adolescence*, *35*, 531-550.

Kilpatrick, W. (1992). *Why Johnny can't tell right from wrong*. New York: Simon & Shuster.

Kim, J., & Sunderman, G. (2004). Increasing bureaucracy or increasing opportunities? School district experience with supplemental educational services. *The Civil Rights Project at Harvard University, Cambridge, MA.*

Kish, S. (2000). Dance drug linked to drain on the brain (ecstasy effects serotonin levels in brain). *New Scientist*, *167*, 23.

Kneeler, R., & Tarver, S. (1977). *Changing perspectives in special education*. Columbus, OH: Merrill.

Lavoie, R. (1989). *Understanding learning disabilities: How difficult can this be?* Washington, DC: PBS Video.

Lavoie, R. (2005). *It's so much work to be your friend.* New York: Simon & Schuster.

Levine, M., & Swartz, C. (1995). The unsuccessful adolescent. *Secondary Education and Beyond: Providing Opportunities for Students with Learning Disabilities*. Retrieved 02/25/2006 from http://www.allkindsofminds.org/caseStudies.aspx

Likert, R. (1932). A technique for the measurement of attitudes. *Archives of Psychology, 140*, 55.

Maslow, A. (1968). *Toward a psychology of being*. New York: Van Nostrand.

Masters, R., & McGuire, M. (1994). *The neurotransmitter revolution: Serotonin, social behavior, and the law*. Southern Illinois University Press.

Mathematical framework for California public schools. (1999). Sacramento: California Department of Education: State Standards.

McKenzie, W. (1999). Multiple Intelligences Inventory. Retrieved on 8/2/2006 from http://surfaquarium.com/MI/inventory.htm.

Merriam-Webster's Collegiate Dictionary Eleventh Edition (11th ed.). (2003). Springfield MA: Merriam-Webster.

Merriam, S. B. (2002). *Qualitative Research in Practice: Examples for discussion and analysis*. San Francisco: Jossey-Bass.

Miller, S. (2000). Introduction to the DVC learning style survey for college. Retrieved 07/20/2006 from http://www.metamath.com/lsweb/dvclearn.htm

Nguyen, T. (2002). Differential effects of a multiple intelligences curriculum on student performance. Retrieved 07/05/2005 from www.dissertation.com/library/1121504a.htm

O'Neal, J. (2004). Learning difficulties: A clearer path to reading fluency. *Biological Psychiatry: Vital Signs:* 1-2.

Parentpals.com (2006). Retrieved 07/20/2006 from http://www.parentpals.com/2.0dictionary/dictnewsindex

Perkins-Gough, D. (2005). The perils of high school exit exams. *Association for Supervision and Curriculum Development: Educational Leadership, 63,* 90-91.

Piaget, J. (1965). *The moral judgment of the child*. New York: The Free Press.

Powell, W., & Napoliello, S. (2004). Using observation to improve instruction. *Educational Leadership*, *62*(5), 52-55.

Ratner, C. (2002). Subjectivity and Objectivity in Qualitative Methodology *Forum: Qualitative Social Research* [On-line Journal], *3*(3). Retrieved 07/20/2005 from http://www.qualitative-research.net/fqs-texte/3-02/3-02ratner-e.htm

Reilly, D. (1999). Diplomates in school psychology: Architects of effective learning. *Education: Project Innovation, Summer 1999*, 1-9.

Retz, W., Retz-Junginger, P., Rosler, M., Supprian, T., & Thome, J. (2004). Association of serotonin transporter promoter gene polymorphism with violence: relation with personality disorders, impulsivity, and childhood ADHD psychopathology. *Behavior Science Law*, *22*(3), 415-425.

Rosenberg, A. (2000). *Philosophy of science*. New York: Routledge.

Santrock, J. (1999). *Life-span development*. Boston: McGraw-Hill College.

Schlaht, J. (2006). Dictionary: For Parents of Children with Disabilities. Retrieved 07/20/2006 from http://www.usd.edu/cd/publications/dictionary.pdf

Schlozmans, S. (2003). The shrink in the classroom. *Educational Leadership, 60, 91-94.*

Schubert, W. (2006). Seeking educational insights from autobiographical and artistic sources: reflecting on *Speak, Hands* as educational text. *Educational Horizons*, *84*(3), 130-135.

Senge, P. (1990). *The fifth disciple: The art & practice of the learning organization.* New York: Doubleday.

Senge, P., Cambron-McCabe, N., Lucas, T., Smith, B., Dutton, J., & Kleiner, A. (2000). *Schools that learn: A fifth discipline fieldbook for educators, parents, and everyone who cares about education*. New York: Doubleday.

Snowden, J. (2003). The effects of inclusion on the anxiety and self-esteem of special education students in the regular education classroom. (Doctoral dissertation, Walden University, 2003). (UMI No. 3106558)

SPSS Student version 12.0 for Windows. (2003). Upper Saddle River, NJ: Prentice-Hall.

Sroufe, J., & Wurtz, S. (2003). The institute of education sciences: What is different? What differences does it make? *American Educational Research Association-Organization of Institutional Affiliates, RPN,* 1-13.

Swinderek, B. (1997). Full inclusion: Making it work. *Journal of Adolescent and Adult Literacy*, *4*(3), 234-235.

Thornton, S. (2001). New approaches to algebra: Have we missed the point? *Mathematics Teaching in the Middle School, 6,* 388-392.

Trochim, W. (2001). *The research methods knowledge base (2nd ed.).* Cincinnati, OH: Atomic Dog Pub.

United Nations Educational, Scientific and Cultural Organization (UNESCO) (1996). *Strengthening the role of teachers in a changing world: Issues, prospects and priorities*. (Working paper prepared for the 45th session of the International Conference on Education, Geneva, Switzerland.) Paris, France

Valenstein, E. (2005). *The war of the soups and the sparks.* New York: Columbia.

Vygotsky, L. (1962). *Thought and language*. Cambridge, MA: MIT Press.

Walden University: The proposal and dissertation guidebook. (2005). Minneapolis MN: *Walden University Publication*. Retrieved 05/05/2006 from http://www.waldenu.edu/c/Students/CurrentStudents_4276.htm

Wenning, R. (2005). A look at growth models. *Northwest Evaluation Association, 4*, 1-4.

Winebrenner, S. (1996). *Teaching kids with learning difficulties in the regular classroom.* Minneapolis, MN: Free Spirit Publications.

Wood, K. (1997). The relationship of impulsivity and extension of future time perspective in adolescents. *Sciences and Engineering*, *58*(5-B), 2707-2737.

APPENDIX A. APPLICATION TO INSTITUTIONAL REVIEW BOARD

The Institutional Review Board (IRB) has approved your application for the study entitled, "Effects of teacher training for individual differences to improve the academic performance of special education inclusion students."

Approval # 10-23-06-0273831

PROJECT INFORMATION

1. Researcher's last name	Swindler
2. Researcher's first name	Marsha
3. Researcher's email address	mswin001@waldenu.edu
4. Project title	Effects of teacher training for individual differences to improve the academic performance of special education inclusion students
5. If researcher is a student, please provide the name of the committee chair or other faculty member supervising this research.	Frank DiSilvestro
6. Email address of committee chair or supervising faculty member	fdisilve@waldenu.edu

7. Walden program affiliation(s) of researcher:

- [x] Education
- [ ] Engineering and Applied Science
- [ ] Health and Human Services
- [ ] Management
- [ ] Nursing
- [ ] Psychology
- [ ] Public Policy
- [ ] Social Work

8. Type of research:

- [x] Doctoral Dissertation
- [ ] Doctoral KAM study
- [ ] Doctoral Pilot Study (i.e., through ED 8458/8468)
- [ ] Ed.D. Doctoral Study
- [ ] Master's Thesis
- [ ] Faculty Research
- [ ] Research for a course (please specify course number) _____
- [ ] Other _____

GENERAL DESCRIPTION OF THE PROPOSED RESEARCH

9. Please check all the research methods that will be used in this study.

X Survey or assessment completed by participant
☐ Interview
☐ Assessment of cognitive or physical performance
☐ Assessment of product or service effectiveness
☒ Assessment of program outcomes
☐ Assessment of treatment outcomes
☐ Analysis of student work products
☐ Analysis of existing public records
☐ Analysis of existing privately held records
☐ Observation of people in public places
☐ Observational study that involves manipulation of the participants' environment
☐ Collection of physical specimens (e.g. blood, saliva)
☐ Use of animals
☐ Experimental groups (i.e., between-subject design)
☐ Experimental conditions, assessments, or tasks (i.e., within-subjects design)
☐ Other (please specify) _____

10. Using lay terms please state your research question. Note: Please do not use jargon or acronyms, as this application needs to be comprehensible to IRB reviewers outside of your field.	Does teacher training specifically designed to incorporate individual differences into regular mainstream curriculum affect the academic success of special education inclusion students?
11. Quantitative researchers: Please list each variable of interest and briefly explain how it will be assessed. Qualitative researchers: Please describe the phenomenon of interest and how it will be recorded. Note: The following section will ask for more detailed information about your data collection tools.	Key variables 1. Independent: teacher training specifically designed to incorporate individual differences into regular mainstream curriculum 2. Dependent: the academic success of special education inclusion students Identical closed question pre-and posttest developed by both teachers collaboratively with the researcher

	(the mainstream inclusion teacher without training and the mainstream inclusion teacher trained in individual differences) will be administered to both Math classes as part of the regular education curriculum by the classroom teacher for each course on the same day and at the same time at Lynwood High School. Collection and grading of tests will be done by the classroom teachers. Semester grades collected from school district records office. No additional pre-and posttests will be necessary for the study as the resource student participants will be included in the regular education pre- and posttesting procedure conducted by the classroom teachers as part of the teacher's regular curriculum. Access to the results of the resource students' pre- and posttests will be provided to the researcher by the classroom teachers. An online student style survey will be accessed through mrsswindler.com with results directly forwarded electronically to the researcher.
12. Please briefly describe the analyses planned. Note: In other words, please describe which statistical or analytical methods you will use to reveal expected relationships, differences, or patterns.	Pre- and posttests designed and field tested by Math teachers familiar with curriculum based on the California High School Exit Exam (CAHSEE) imposed by state of California (State Standards, 1999) will be analyzed using appropriate statistical procedure to reveal relationships, differences, and patterns.

13. Please briefly describe the research procedures, along with the duration, location, and communication format for each. You probably will not need to use all the rows provided but you must describe any of the following that apply to your study: examination of records, initial contact, informed consent procedures, surveys, interviews, assessments, observations, intervention/treatment, review of interview transcripts, and dissemination of study's results to participants and stakeholders. If there are more than 10 steps, then you may email an attachment (e.g., your proposal's method section) to irb@waldenu.edu.

	Brief description	***Duration***	***Exact Location***	Communication Format
Step 1 Typically initial contact	Initial contact with Dr.Roberto Casas, Lynwood Unified School District Assistant Superintendent 11321 Bullis Road Lynwood, California 90262 Phone: 310-886-1621 ext# 1421 E-mail: rcasas@lynwood.k12.ca.us	60 minutes	school district office	phone, email, and in person
Step 2 Typically consent	Informed consent procedures: copy of consent forms sent in email for preview previous to in person meeting. Classroom teachers will pass out consent forms to all student participants, explaining reasons for informed consent forms. To protect anonymity of the resource students under consideration for participation in the study all students in the class will be asked to return signed consent forms. Separate forms for student participants and parents/guardians will be distributed to all students in the class. A classroom discussion will ensue after distribution of consent forms to allow time for questions to be answered. A special education teacher normally assigned to the classroom as a co-teacher and a regular education teacher will be present for the question and answer session.	30 minutes	school district office	email followed by in person meeting

	Students will be asked to return the signed parent permission consent form to the classroom teacher the next day. The signed consent forms will be delivered in a sealed envelope by the classroom teacher to the district office of the assistant superintendent, Dr. Roberto Casas, the initial contact.			
Step 3	Collection of consent forms by researcher	20 minutes	school district office	in person
Step 4	Teacher survey distribution regarding any previous training for special education inclusion students' procedure: The assistant superintendent will introduce researcher to teachers at Math department faculty meeting. Researcher will briefly describe research and survey intentions, initiating a question and answer session. Researcher will distribute survey and provide basket for completed surveys to be deposited following discussion.	30 minutes	school district office at Math department faculty meeting	in person
Step 5	Collection of teacher survey by researcher	10 minutes	school district office	in person
Step 6	Pre- and posttest procedure are part of the regular curriculum of the class, developed by the classroom teachers collaboratively. Distribution, administration, collection, and grading of tests will be done by the classroom teacher so as not to disrupt the classroom environment, and to protect the anonymity of the study participants. Teacher will deliver pre- and posttest results to district office in a sealed envelope.	20 minutes	both Math classrooms	conducted by regular education teacher and special education teacher assigned to co- teach the class
Step 7	Collection of pre- and posttest results by researcher.	20 minutes	school district office	in person

Step 8	Semester grading procedure will coincide with the Lynwood Unified School District regulations for grading and can be found at http://www.lynwoodusd.org/home.asp	20 minutes	school campus	regular and special education classroom teachers will conduct semester grading collaborate
Step 9	Collection of semester grades by researcher	20 minutes	school district records office	in person
Step 10	Dissemination of test study results to assistant superintendent	60 minutes	school district office	in person

DATA COLLECTION TOOLS

14. Please indicate the sources of each of your data collection tools.

I created the following data collection tools myself: Identical closed question pre- and post test developed by the researcher with both Math teachers collaboratively (the mainstream inclusion teacher without training and the mainstream inclusion teacher trained in individual differences) will be administered to both Math classes by the classroom teacher for each course on the same day and at the same time at Lynwood High School at the beginning of the semester, and again at the end of the semester. Distribution, administration, collection, and grading of tests will be done by the classroom teacher so as not to disrupt the classroom environment, and to protect the anonymity of the study participants.

Teacher observations including antidotal records on class projects and/or assignments, along with
semester grades will be collected from Lynwood High School records office. The antidotal records will be taken by the special education support personnel trained in record taking procedure, in collaboration with the classroom teacher. The special education department provides an assigned teacher or instructional aide to the classroom for the semester to support and co-teach with the regular education teacher. Semester grading procedure will coincide with the Lynwood Unified School District regulations for grading and can be found at http://www.lynwoodusd.org/home.asp

Teacher survey regarding any previous training to work with special education resource students was developed by the researcher and will be given to the teachers in a Math department faculty meeting at the district office of the high school campus where the student participants were selected for participation in the study.

Student learning style survey
will be accessed through the website of the researcher: mrsswindler.com The full APA citation for the Multiple Intelligences Inventory is included below, with permission granted through the Internet link http://www.surfaquarium.com/MI/inventory.htm .

I have purchased legal copies of the following data collection tools: N/A

The following data collection tools are not published and I will be sending the author's permission at the same time I submit this form: N/A

15. If any of your data collection instruments were created by someone else, please provide the full citation for each instrument's source in APA format.	McKenzie, W. (1999). The Multiple Intelligences Inventory. Retrieved on 8/02/2006 from http://www.surfaquarium.com/MI/inventory.htm

DESCRIPTION OF THE RESEARCH PARTICIPANTS

16. Provide the target number of participants. 120

17. Describe the criteria for inclusion and exclusion of participants in this study (such as relevant experiences, age, gender, health conditions, etc). Your inclusion criteria should define all critical characteristics of your sample. Once you've defined inclusion criteria, if you have no further limitations on who can participate, then just indicate "none" under exclusion criteria.

Inclusion criteria: Participants will be identified through the special education resource program department records. Students with an Individualized Education Program (IEP) identifying a disability in need of accommodation will qualify for the study. The resource program involves students who have been identified with minimal disabilities in three or less areas of development, some of which may be identified as mild organizational disabilities. To qualify for the resource program high peaks of cognitive ability are recognized as the initial criteria, with three or fewer areas recognized as below the average criteria, in need of additional educational accommodations, thus constituting the special education identification. The high school resource students are mainstreamed as inclusion students into the regular curriculum classrooms and have reading levels above the 6th grade reading level.

Exclusion criteria: none

18. Please indicate whether each of the following vulnerable or protected populations is targeted, included, or excluded from your study.

	Targeted	*Included* (But not targeted)	*Excluded*
Pregnant Women	☐	☐	☒
Children	☐	☒	☐
Prisoners	☐	☐	☒
Residents of Any Facility (Nursing Home, Assisted	☐	☐	☒
Mentally/Emotionally Disabled Individuals	☐	☐	☒

Non-English Speakers	☐	☐	☒
Elderly Individuals (65+)	☐	☐	☒
Traumatized Individuals	☐	☐	☒
Economically Disadvantaged Individuals	☐	☐	☒
Clients or Potential Clients of the Researcher	☐	☐	☒
Other _____	☐	☐	☐
None of the above	☐	☐	☐

ADDITIONAL ISSUES TO ADDRESS WHEN PARTICIPANTS INCLUDE RESIDENTS OF A FACILITY

19. Will your sample include residents of any facility (including prisons, juvenile detention centers, nursing homes, mental health facilities, rehabilitation facilities, etc.)

☐ Yes → Please complete question 20.
☒ No → Please skip ahead to question 21.

ADDITIONAL ISSUES TO ADDRESS WHEN PARTICIPANTS INCLUDE PROTECTED POPULATIONS

21. Will your sample include any members of vulnerable or protected populations listed in question 18?
☒ Yes → Please complete questions 22-23.
☐ No → Please skip ahead to question 24.

22. Please briefly justify the inclusion of each protected population.	The purpose of this study is to examine the relationship between teacher training and student academic achievement to determine if high school special education resource inclusion students at Lynwood High School in California are at a disadvantage for academic success when taught by teachers without

	training to recognize and incorporate individual differences into mainstream curriculum.
23. If competency to provide consent could possibly be an issue, describe how competency will be determined and your plan for obtaining consent. If not applicable, please indicate NA.	A parent/guardian consent form will be obtained from each participant, as well as a student consent form, so as to avoid any confusion into the competency of the student participants. The high school resource students participating in the study have a reading competency above the 6th grade level. The classroom teachers will distribute, explain, and collect participant and parent/guardian consent forms from the students in consideration of the study.

ADDITIONAL ISSUES TO ADDRESS WHEN PARTICIPANTS INCLUDE CHILDREN

24. Will your sample include individuals less than 18 years of age?
☒ Yes → Please complete questions 25-26.
☐ No → Please skip ahead to question 27.

25. If this study proposes to include minors, this inclusion must meet one of the following criteria for risk/benefit assessment, according to the federal regulations (link provided on IRB page of the Walden Research Center website).

Check the one appropriate box:
☒ Minimal risk
☐ Greater than minimal risk, but holds prospect of direct benefit to participants
☐ Greater than minimal risk, no prospect of direct benefit to participants, but likely to yield generalizable knowledge about the participant's disorder or condition.

26. Please explain how the criterion in question 25 is met for this study.	Approval for use of student records comes from Dr. Roberto Casas, assistant superintendent of Lynwood Unified School District. An informed consent document will be used to secure consent of participants. Parents/guardians of the participants will also be provided with an informed consent document to be secured for the study.

COMMUNITY RESEARCH STAKEHOLDERS AND PARTNERS

27. Please identify all community stakeholders who should hear about your research results and indicate your specific plan for disseminating your results in an appropriate format. Note: Walden students are required to disseminate their research results in a responsible, respectful manner and are encouraged to develop this dissemination plan in consultation with the relevant community partner(s). Sometimes it is appropriate to provide a debriefing session/handout to individual participants immediately after data collection in addition to a general stakeholders' debriefing after data analysis.	Lynwood Unified School District representative, Dr. Roberto Casas, assistant superintendent, will be the community stakeholder with whom dissemination will take place. A meeting will be scheduled following the data collection, at his convenience, to disseminate the results of the study.
28. Please specify the name(s) and roles of any community partner organizations you propose to involve in identifying potential participants or collecting data. Also please identify the individual who will be signing the letter of cooperation. (See IRB section of the Walden website for a sample letter). Note: If you have no community research partner, that means you are solely relying on **public** records to recruit participants and collect data.	Assistant Superintendent Dr. Roberto Casas Lynwood Unified School District 11321 Bullis Road Lynwood, California 90262 Phone: 310-886-1621 ext# 1421 E-mail: rcasas@lynwood.k12.ca.us
29. Please briefly describe how you chose each of the partners listed above.	Dr. Roberto Casas was chosen to sign the letter of cooperation as he is the assistant superintendent for the Lynwood Unified School District who oversees the special education department for the school district.

POTENTIAL RISKS AND BENEFITS

30. Please conservatively estimate the potential level of risk to **participants and stakeholders** relevant to each of the following categories. Please note: Minimal risk is acceptable but must be identified upfront.				
	None	**Minimal**	**Moderate**	**Substantial**
A. Unintended disclosure of confidential information (such as educational or medical records)	☒	☐	☐	☐
B. Psychological stress greater than what one would experience in daily life (e.g., materials or topics that could be considered sensitive, offensive, threatening, or degrading)	☒	☐	☐	☐
C. Attention to personal information that is irrelevant to the study (i.e., related to sexual practices, family history, substance use, illegal behavior, medical or mental health)	☒	☐	☐	☐
D. Unwanted solicitation, intrusion, or observation in public places	☒	☐	☐	☐
E. Unwanted intrusion of privacy of others not involved in study (e.g. participant's family).	☒	☐	☐	☐
F. Social or economic loss (i.e., collecting data that could be damaging to any participants' or stakeholders' financial standing, employability or reputation)	☒	☐	☐	☐
G. Perceived coercion to participate due to any existing or expected relationship between the participant and the researcher (or any entity that the researcher might be perceived to	☒	☐	☐	☐
H. Misunderstanding as a result of experimental deception (such as placebo treatment or use of confederate research assistants posing as someone else)	☒	☐	☐	☐
I. Minor negative effects on participants' or stakeholders' health (no risk of serious injury)	☒	☐	☐	☐
J. Major negative effects on participants' or stakeholders' health (risk of serious	☒	☐	☐	☐
31. Explain what steps will be taken to	Children between the ages of 14 and 18			

minimize risks and to protect participants' and stakeholders' welfare. If the research will include protected populations, please identify each group and answer this question for each group.	will be included in the study and a consent form for permission to participate in the study will be obtained for each participant from parents/guardians and from the participant.
32. Please describe the anticipated benefits of this research for individual participants.	The hidden advantage to teacher training for alternate learning styles incorporated into pedagogical practices benefits all students, regardless of placement in or out of special education programs.
33. Describe the anticipated benefits of this research for society.	Special Education students have the capacity to learn, albeit in an alternate learning style. Alternate learning styles are conducive to special education student learning capabilities as well as to regular education student capabilities. Adapting curriculum may not be as difficult as once perceived through the eyes of regular education teachers. This study seeks to determine if the incorporation of teacher training into current pedagogical practice will heighten educator awareness of alternate learning styles, also known as individual differences, thus affecting academic outcomes for inclusion students. Academic outcomes of special education high school resource inclusion students taught by teachers with and without training in individual differences will be contrasted.

DATA CONFIDENTIALITY

34. In what format will you store the data? (paper, electronic media, video, audio)	electronic media

35. Where will you store the data?	lock box at the home of the principal investigator
36. How long will you keep the data? (Five years is the minimum requirement.)	5 years
37. Describe what security provisions will be taken to protect this data (e.g., password protection, locks).	password protection
38. Will you record any direct identifiers, names, social security numbers, addresses, telephone numbers, etc? ☒ No ☐ Yes, and the following coding system will be used to protect against disclosure of these identifiers: _____	
39. Will you retain a link between study code numbers and direct identifiers after the data collection is complete? ☒ No ☐ Yes, it is necessary because _____ ☐ Not applicable to my research proposal	
40. Will you provide an identifier or potentially identifying link to anyone else besides yourself? ☒ No ☐ Yes, it is necessary because _____ ☐ Not applicable to my research proposal	
41. Explain who will approach potential participants to take part in the research study and what will be done to protect individuals' privacy in this process.	The classroom teacher will make the necessary contacts with participants through regular classroom activity. The classroom teachers will pass out the consent forms to all of the students at some point during the course of the class, previously agreed upon between the researcher and the teacher, so as not to call undue attention to the resource students involved in the study, thus protecting their rights to anonymity. This procedure is chosen so as to eliminate any unnecessary disturbance to the students and the

	teacher. This can be done at the onset of the course, during a natural break in the course (first test, semester break, ending phase of the course), as per teacher preference. After the consent forms are distributed during a class session, a classroom discussion concerning the study will ensue and the high school students may ask questions until the discussion covers all inquiries. The teachers will provide any necessary explanations. The teachers are familiar with the resource students and have the necessary preparation to answer any questions that may arise. An Instructional Aide and a Resource teacher from the special education department are assigned to the classrooms involved in the study so that there is additional support for any questions that the classroom teachers defer to the special education department representatives. The students will be asked to take the forms home and have them signed by their parents or guardians, and return the signed form the next day to the teacher.
42. Please list all individuals who will have access to the data (including research assistants, transcribers, statisticians, etc). If you are a student, the IRB assumes your supervising faculty members will have access to the data, so you do not need to list them.	The principal investigator will have access to the data.

43. To ensure data confidentiality among your research colleagues, you will either need to obtain a signed confidentiality agreement for each person you listed for Question 42 or de-identify the data (by removing all identifying links) before anyone else has access to it. Please visit the Walden Research Center website to download a sample confidentiality agreement. Either handwritten or electronic signatures will be sufficient. You will be directed to send the IRB your signed confidentiality forms at the same time you submit this IRB form.

Please check all that apply.

☐ I will be emailing the signed confidentiality agreement(s) to irb@waldenu.edu.
☐ I will be faxing the signed confidentiality agreement(s) to (626) 605-0472.
☒ Not applicable because I am the only one who will have access to the raw data.
☐ Not applicable because the accessible data is anonymous or de-identified.

44. If the data collected contains information about illegal behavior, it might be appropriate for you to obtain a Federal Certificate of Confidentiality, which can shield your data from subpoena. The IRB page of Walden Research Center website provides a link to NIH's online Kiosk, which provides more information.

Will you obtain a Federal Certificate of Confidentiality for this research?
☐ Yes. I will be submitting a copy at the same time I submit this form to irb@waldenu.edu
☐ No. My research involves reports of illegal behavior but I have opted not to seek a Federal Certificate of Confidentiality.
☒ No. My research does not ask participants to report any type of illegal behavior.

ADDITIONAL ISSUES TO ADDRESS WHEN THE RESEARCH INVOLVES PROTECTED HEALTH INFORMATION

45. As part of this study, the researcher(s) will:
☐ Collect protected health information* from participants → Please complete question 46.
☐ Have access to protected health information* in the participants' records → Please complete question 46.

☒ None of the above → Please skip to question 47.

***Protected Health Information (PHI)** is defined under HIPAA (Health Insurance Portability and Accountability Act of 1996) as health information transmitted or maintained in any form or medium that:*
A. identifies or could be used to identify an individual;
B. is created or received by a healthcare provider, health plan, employer or healthcare clearinghouse; and
C. relates to the past, present or future physical or mental health or condition of an individual; the provision of health care to an individual; or the past, present or future payment for the provision of healthcare to an individual.

For more information on protected health information, please visit the IRB page of the Walden Research Center website.

46. To use PHI in research you must have approval through one of the following methods:
A. An authorization signed by the research participant that meets HIPAA requirements; or
B. Use of a limited data set under a data use agreement.

Check below to indicate which method of approval you will use.

☐ A. Research participants in this study will sign an *Authorization to Use or Disclose PHI for Research Purposes* form. If the study includes multiple activities (e.g., clinical trial or collection and storage of PHI in a central repository), then two authorization forms must be submitted for review. You may download a sample authorization form at the Research Center website, fill in the required information, and fax to (626) 605-0472.

☐ B. I will access a limited data set by signing a data use agreement with the party that releases the PHI. A limited data set must have all possible identifiers removed from the data. It is the responsibility of the researcher and the party releasing the PHI to have in place and maintain a copy of a data use agreement which meets HIPAA requirements. Use the template data use agreement and fill in the required information. A copy of the signed Data Use agreement must be submitted for review.

POTENTIAL CONFLICTS OF INTEREST

47. Do any of the researchers have a potential conflict of interest associated with this study? In other words, is it possible that the professional positions or financial situations of the researchers or their families be directly impacted by the design, conduct, or results of this research?

☒ No
☐ Yes, and the conflict of interest is being managed by _____

48. Most researchers have multiple roles in their professional environment. At the time of study recruitment, are the potential study participants aware of any of the researchers' other professional or public roles? (Such as teacher, therapist, community leader, etc.?)

☒ No
☐ Yes, at the time of recruitment some of the participants are aware of the researcher's _____ role, and the following measures will be taken to distinguish his/her research role and minimize perceived coercion to participate: _____

49. Will the researcher give participants or stakeholders any gifts, payments, compensation, reimbursement, free services, or extra credit?

☒ No
☐ Yes. More information is provided below.
What compensation will be given? _____
At what point during the research will the compensation be given? _____
Under what conditions will the compensation be given? (i.e., how will compensation for withdrawn participants be handled?) _____

INFORMED CONSENT

The final checklist will direct you to email your consent/assent forms to irb@waldenu.edu at the same time you submit this IRB form. Your application is not considered complete until they are received.

Please affirm that your consent form(s) contain each of the following required elements.	**YES**	**NA**
Statement that the study involves research	☒	☐
Statement of why subject was selected	☒	☐
Disclosure of the identity and all relevant roles of researcher (e.g., Ph.D. candidate, part-time faculty member, facility owner)	☒	☐
An understandable explanation of research purpose	☒	☐
An understandable description of procedures	☒	☐

Expected duration of subject's participation	☒	☐
Statement that participation is voluntary	☒	☐
Statement that refusing or discontinuing participation involves no penalty	☒	☐
Description of reasonably foreseeable risks or discomforts	☒	☐
Description of anticipated benefits to subjects or others	☒	☐
Information on compensation for participation	☒	☐
Description of how confidentiality will be maintained	☒	☐
Whom to contact with questions about the research	☒	☐
Statement that subject may keep a copy of the informed consent form	☒	☐
All potential conflicts of interest are disclosed	☐	☒
Consent process and documentation are in language understandable to the participant	☒	☐
There is no language that asks the subject to waive his/her legal rights	☒	☐
If appropriate, indicates that a procedure is experimental (i.e., not a standard Rx)	☐	☒
If appropriate, disclosure of alternative procedures/treatment	☐	☒
If appropriate, additional costs to subject resulting from research participation	☐	☒

EXPEDITED REVIEW CRITERIA

51. Your study qualifies for expedited review if all research activities therein fall under one or more of the following minimal risk categories. If the IRB chair agrees that your study is limited to the following categories, your IRB application will be reviewed by a single member of the Institutional Review Board rather than the full IRB (and this is typically 1-3 weeks faster than full review). If applicable, please indicate which expedited review categories apply to this research.

☒ Educational Research: Research conducted in established or commonly accepted educational settings, involving normal educational practices, such as (a) research on regular and special education instructional strategies, or (b) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.

☐ Performance and Opinion Research: Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless: (a) information obtained is recorded in such a manner that human participants can be identified, directly or through identifiers linked to the

participants; and (b) any disclosure of the human participants' responses outside the research could reasonably place the participants at risk of criminal or civil liability or be damaging to the participants' financial standing, employability, or reputation. Potentially upsetting or offensive content is not eligible for expedited review.

☐ Archival Research: Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that participants cannot be identified, directly or through identifiers linked to the participants.

☐ Evaluation of Public Programs: Evaluation and demonstration projects that are conducted by or subject to the approval of Department or Agency heads, and which are designed to study, evaluate, or otherwise examine: (a) Public benefit or service programs; (b) procedures for obtaining benefits or services under those programs; (c) possible changes in or alternatives to those programs or procedures; or (d) possible changes in methods or levels of payment for benefits or services under those programs.

☐ Expedited review is not appropriate for my research.

FINAL IRB CHECKLIST

52. Please indicate below which method you are using to send each of your supporting documents. We ask that you send these supporting documents to the IRB at the same time you submit this application. Students must obtain their supervising faculty member's approval on the last page before submitting any materials to the IRB.

	Emailed to irb@waldenu.edu	**Faxed to (626) 605-0472**	**Not applicable to my study**
Data collection tools (e.g., surveys, interviews, assessments, etc.)	☒	☐	☐
Letters of permission from authors of data collection tools	☒	☐	☐
Letters of cooperation from community partners	☒	☐	☐
Invitation to participate in research (e.g., letter, flier, phone script, ad, etc.)	☐	☐	☒

Signed confidentiality agreements	☐	☐	☒
Federal certificate of confidentiality (to shield data from subpoena)	☐	☐	☒
Consent/assent forms	☒	☐	☐

Please maintain a copy of this completed application for your records.

Once the IRB application and all supporting documents have been received, the Research Coordinator will email the researcher and any relevant faculty supervisors to confirm that the IRB application is complete. At this time, the Research Coordinator will also notify the researcher of the expected IRB review date for the proposal.

The review date will be scheduled no later than three weeks after your completion of this application. In the case of Ph.D. candidates, the review date will be scheduled no later than three weeks after both A) the application is complete and B) the proposal is fully approved.

Notice of outcome of the IRB review will be emailed to the researcher and any supervising faculty members within one week of the review. Please be aware that the IRB committee might require revisions or additions to your application before approval can be granted.

Neither pilot nor research data may be collected before notification of IRB approval. Students collecting data without approval risk expulsion and invalidation of data. The IRB will make every effort to help researchers move forward in a timely manner. Please contact irb@waldenu.edu if you have any questions.

RESEARCHER ELECTRONIC SIGNATURE

53. By checking each of these boxes and providing my email address below as an authentication, I am providing an electronic signature certifying that each of the statements below is true.

☒ The information provided in this application form is correct.
☒ I agree to conduct this and all future IRB correspondence electronically, via email/fax.
☒ I, the researcher, will request IRB approval before making any substantive modification to this study using the Request for Change in Procedures Form found at the Walden Research Center website.
☒ I, the researcher, will report any unexpected or otherwise significant adverse events and general problems within one week using the Adverse Event Reporting Form found at the Walden Research Center website.
☒ Neither recruitment nor data collection will be initiated until final IRB approval is granted.
☒ I understand that this research, once approved, is subject to continuing review and approval by the Committee Chair and the IRB.
☒ I, the researcher, will maintain complete and accurate records of all research activities.
☒ I understand that if any of the conditions above are not met, this research could be suspended and/or not recognized by Walden University.

Researcher email address (provides authentication for electronic signature and thus must match email address on file with Walden University)	mswin001@waldenu.edu

Research Center Policy on Electronic Signatures
Walden's Research Center manages dissertation, thesis, and IRB processes in a nearly paperless environment, which requires reliance on verifiable electronic signatures, as regulated by the Uniform Electronic Transactions Act. Legally, an "electronic signature" can be the person's typed name, their email address, or any other identifying marker. An electronic signature is just as valid as a written signature as long as both parties have agreed to conduct the transaction electronically. The Research Coordinator will verify any electronic signatures that do not originate from a password-protected source (i.e., an email address officially on file with Walden).

Supervising Faculty Member Electronic Signature

54. As the faculty member supervising this research, I assume responsibility for ensuring that the student complies with University and federal regulations regarding the use of human participants in research. By checking each of these boxes and providing my email address below as an authentication, I am providing an electronic signature certifying that each of the statements below is true. ☒ I affirm that this research proposal is in keeping with the standards set by the University. ☒ I affirm that the researcher has met all academic program requirements for review and approval of this research. ☒ I will ensure that the researcher properly requests any protocol changes using the Request for Change in Procedures Form found at the Walden Research Center website. ☒ I will ensure that the student promptly reports any unexpected or otherwise significant adverse events and general problems within 1 week using the Adverse Event Reporting Form found at the Walden Research Center website. ☒ I will report any noncompliance on the part of the researcher by emailing notification to irb@waldenu.edu.	
Faculty member email address (provides authentication for electronic signature and thus must match email address on file with Walden University):	fdisilve@waldenu.edu

Research Center Policy on Electronic Signatures

Walden's Research Center manages dissertation, thesis, and IRB processes in a nearly paperless environment, which requires reliance on verifiable electronic signatures, as regulated by the **Error! Bookmark not defined.**. Legally, an "electronic signature" can be the person's typed name, their email address, or any other identifying marker. An electronic signature is just as valid as a written signature as long as both parties have agreed to conduct the transaction electronically. The Research Coordinator will verify any electronic signatures that do not originate from a password-protected source (i.e., an email address officially on file with Walden).

APPENDIX B: STUDENT ALGEBRA 1 PRETEST

Student ID number_____
Please show all of your work on attached sheets of paper. Circle final answers. Good luck!

1. Find the prime factorization of 248.

2. Find the LCM: 12, 24, 42.

3. Write an expression equivalent to 2/3 by multiplying by 1 using 3/5.

4. Write an expression equivalent to 11/12 with a denominator of 48.

5. Simplify: 5/128

6. Simplify: 28/42

7. Compute and simplify: 3/5 ÷ 6/11

8. Compute and simplify: 3/7 -1/3

9. 3/10+1/5

10. 4/7 · 5/12

11. Convert to a fractional notation (do not simplify): 32.17

12. Convert to a decimal notation: 789/10,000

13. Add: 8.25+91+34.7862

14. Subtract: 230 -17.95

15. Multiply: 34.78x10.08

16. Divide: 78.12 ÷ 6.3

17. Convert to a decimal notation: 13/9

18. Round to the nearest hundredth: 345.8395

19. Round to the nearest tenth: 345.8395

20. Convert to decimal notation: 11.6%

21. Convert to a fractional notation: 87%

22. Convert to a percent notation: 7/8

23. Write exponential notation: 5 · 5 · 5 · 5

24. Evaluate: 2^3

25. Evaluate: $(1.1)^2$

26. Calculate: $9 \cdot 3 + 24 \div 4 - 5^2 + 10$

APPENDIX C: STUDENT ALGEBRA 1 POSTTEST

Student ID number_____ Please show all of your work.

Circle final answers. Good luck!

1. Find the prime factorization of 300.

2. Find the LCM: 15, 24, 60.

3. Write an expression equivalent to 3/7 using 7/7 as a name for 1.

4. Write an equivalent expression with the given denominator: 11/16. (Denominator: 48)

5.Simplify: 16/24

6. Simplify: 925/1525

7. Compute and simplify: 10/27 ÷ 8/3

8. Compute and simplify: 9/10 -5/8

9. Convert to a fractional notation (do not simplify): 6.78

10. Convert to a decimal notation: 1895/1000

11. Add: 7.14 + 89 + 2.8787

12. Subtract: 1800 – 3.42

13. Multiply: 123.6 x 3.52

14. Divide: 11.52 ÷ 7.2

15. Convert to a decimal notation: 23/11

16. Round 234.7284 to the nearest tenth

17. Round 234.7284 to the nearest thousandth

18. Convert to decimal notation: 0.7%

19. Convert to a fractional notation: 91%

20. Convert to a percent notation: 11/25

21. Evaluate: 5^4

22. Evaluate: $(1.2)^2$

23. Calculate: $200 – 2^3 + 5 + 10$

24. Calculate: 8000 ÷ 0.16 ÷ 2.5

25. Simplify: 13,860/42,000

APPENDIX D: SPECIAL EDUCATION STUDENT SURVEY FOR TEACHERS

The researcher wants to find out if (1) teachers have received any type of training for the individual differences of the special education inclusion students enrolled in mainstream classes, and (2) the success rate (passing semester grade) of the students.

By completing the short questionnaire, data will be gathered to evaluate how the special education community can further assist educator needs. Thank you in advance for your honesty to further the educational opportunities for all students. Answers will remain anonymous and statistical results will be posted on the bulletin board in the faculty lounge before the next department meeting.

As you leave the department meeting today, please drop your survey into the specially marked Survey Collection basket on the table in the lobby between the two exit doors. Participation is voluntary.

Circle the one response for each statement that comes closest to your opinion using the five-point agreement scale as follows:

Strongly Agree=SA Agree=A Neutral=N Disagree=D Strongly Disagree=SD

1. Special education inclusion students succeed (earn a passing grade) in my classes without altering the curriculum.

SA A N D SD

2. I alter the curriculum to accommodate individual differences:

SA A N D SD

3. I received training for individual differences for the special education inclusion students that I teach or have taught:

SA A N D SD

4. I read, or sought some other educational approach in order to understand individual differences in my special education inclusion students:

SA A N D SD

5. If training were available, I would participate:

SA A N D SD

Thank you for your participation.

Marsha Swindler

Walden University Ph.D. researcher

APPENDIX E: MULTIPLE INTELLIGENCE INVENTORY/LEARNING STYLES

http://surfaquarium.com/MI/inventory.htm

Complete each section by placing a "1" next to each statement you feel accurately describes you. If you do not identify with a statement, leave the space provided blank. Then total the column in each section.

Section 1

_____ I enjoy categorizing things by common traits
_____ Ecological issues are important to me
_____ Classification helps me make sense of new data
_____ I enjoy working in a garden
_____ I believe preserving our National Parks is important
_____ Putting things in hierarchies makes sense to me
_____ Animals are important in my life
_____ My home has a recycling system in place
_____ I enjoy studying biology, botany and/or zoology
_____ I pick up on subtle differences in meaning
_____ TOTAL for Section 1

Section 2

_____ I easily pick up on patterns
_____ I focus in on noise and sounds
_____ Moving to a beat is easy for me
_____ I enjoy making music
_____ I respond to the cadence of poetry
_____ I remember things by putting them in a rhyme
_____ Concentration is difficult for me if there is background noise
_____ Listening to sounds in nature can be very relaxing
_____ Musicals are more engaging to me than dramatic plays
_____ Remembering song lyrics is easy for me
_____ TOTAL for Section 2

Section 3

_____ I am known for being neat and orderly
_____ Step-by-step directions are a big help
_____ Problem solving comes easily to me
_____ I get easily frustrated with disorganized people
_____ I can complete calculations quickly in my head
_____ Logic puzzles are fun
_____ I can't begin an assignment until I have all my "ducks in a row"
_____ Structure is a good thing
_____ I enjoy troubleshooting something that isn't working properly
_____ Things have to make sense to me or I am dissatisfied
_____ TOTAL for Section 3

Section 4

_____ It is important to see my role in the "big picture" of things
_____ I enjoy discussing questions about life
_____ Religion is important to me
_____ I enjoy viewing art work
_____ Relaxation and meditation exercises are rewarding to me
_____ I like traveling to visit inspiring places
_____ I enjoy reading philosophers
_____ Learning new things is easier when I see their real world application

_____ I wonder if there are other forms of intelligent life in the universe
_____ It is important for me to feel connected to people, ideas and beliefs
_____ TOTAL for Section 4

Section 5

_____ I learn best interacting with others
_____ I enjoy informal chat and serious discussion
_____ The more the merrier
_____ I often serve as a leader among peers and colleagues
_____ I value relationships more than ideas or accomplishments
_____ Study groups are very productive for me
_____ I am a "team player"
_____ Friends are important to me
_____ I belong to more than three clubs or organizations
_____ I dislike working alone
_____ TOTAL for Section 5

Section 6

_____ I learn by doing
_____ I enjoy making things with my hands
_____ Sports are a part of my life
_____ I use gestures and non-verbal cues when I communicate
_____ Demonstrating is better than explaining
_____ I love to dance
_____ I like working with tools
_____ Inactivity can make me more tired than being very busy
_____ Hands-on activities are fun
_____ I live an active lifestyle
_____ TOTAL for Section 6

Section 7

_____ Foreign languages interest me
_____ I enjoy reading books, magazines and web sites
_____ I keep a journal
_____ Word puzzles like crosswords or jumbles are enjoyable
_____ Taking notes helps me remember and understand
_____ I faithfully contact friends through letters and/or e-mail
_____ It is easy for me to explain my ideas to others
_____ I write for pleasure
_____ Puns, anagrams and spoonerisms are fun
_____ I enjoy public speaking and participating in debates
_____ TOTAL for Section 7

Section 8

_____ My attitude effects how I learn
_____ I like to be involved in causes that help others
_____ I am keenly aware of my moral beliefs
_____ I learn best when I have an emotional attachment to the subject
_____ Fairness is important to me
_____ Social justice issues interest me
_____ Working alone can be just as productive as working in a group
_____ I need to know why I should do something before I agree to do it
_____ When I believe in something I give more effort towards it
_____ I am willing to protest or sign a petition to right a wrong
_____ TOTAL for Section 8

Section 9

_____ I can visualize ideas in my mind
_____ Rearranging a room and redecorating are fun for me
_____ I enjoy creating my own works of art
_____ I remember better using graphic organizers
_____ I enjoy all kinds of entertainment media
_____ Charts, graphs and tables help me interpret data
_____ A music video can make me more interested in a song
_____ I can recall things as mental pictures
_____ I am good at reading maps and blueprints
_____ Three dimensional puzzles are fun
_____ TOTAL for Section 9

Part II

Now carry forward your total from each section and multiply by 10

Part III

Now plot your scores on a bar graph:

Part IV

Now determine your intelligence profile!

Key:

Section 1 – This reflects your Naturalist strength
Section 2 – This suggests your Musical strength
Section 3 – This indicates your Logical strength
Section 4 – This illustrates your Existential strength
Section 5 – This shows your Interpersonal strength
Section 6 – This tells your Kinesthetic strength
Section 7 – This indicates your Verbal strength
Section 8 – This reflects your Intrapersonal strength
Section 9 – This suggests your Visual strength

Remember:

Everyone has all the intelligences!
You can strengthen an intelligence!
This inventory is meant as a snapshot in time – it can change!
M.I. is meant to empower, not label people!

APPENDIX F: PARTICIPANT CONSENT FORM

Dear Student,

You are invited to participate in a research study. The following questions may help you to better understand this form:

What is the reason for the study?

Sometimes Math is a difficult subject for students. The study is designed to better understand what might be difficult in Math, and why it might be difficult.

Who is conducting the study?

This study is being conducted by Marsha Swindler, a PhD university student candidate.

Why am I invited to participate?

You are invited to participate in this study because you are a high school student in an Algebra class this semester, and may have an Individual Education Program (IEP) supervised by the special education department.

What is the purpose of the study?

The purpose of the study is to discover if specific teacher training to better understand students with learning disabilities will affect the academic success of resource inclusion students in a mainstream Math class like the one you are enrolled in this semester.

Who are the other participants in this study?

The students who have registered for Algebra this semester are being asked to participate in this study. Therefore, your fellow classmates who offer their consent will also be participating in this study.

What will be asked of me if I decide to participate in this study?

If you agree to participate in this study, you will be asked to 1) do what the Math teacher requires according to the class syllabus, and 2) take an informational inventory in special education class that helps students to discover individual strengths in learning. The inventory will take less than 30 minutes, and the results will give you information about learning styles that can be used in all classes in the future. The researcher will use the results in a chart to compare the different learning styles. You will use an identification number on the form and not a name.

How long will this study last?

The study will last one quarter, as soon as you give your permission, and end on the last day of the semester in January 2007.

What about my right to privacy, and will the results stay private?

The records of this study will be kept private. The researcher will not see your name, and will not know who you are. You will write your ID number and your name on your tests and assignments, and your teacher will take your name off before the researcher sees any grades on any tests, assignments, or projects. If any report of this study might be published, the researcher will not include any information that will make it possible to identify you as a participant. Research records will be kept in a locked file, and only the researcher will have access to the records.

What can I expect by participating in this study?

You can expect that your Algebra class is the same whether there was a study or not. The only difference will be that test scores and semester grade will be submitted to the researcher, and the informational inventory will be taken in special education class. There are no risks by participating in this study, and there are no compensations for participating.

What are my rights?

If you decide to give your permission to participate in the study, you have the right to withdrawn from the study later if you change your mind. If you change your mind, your grade will not be submitted to the researcher, and you will not complete the information inventory, but you will still be required to finish the requirements from your teacher to complete the course.

Is there anyone I can contact should I need to?

Yes. The researcher conducting this study is Marsha Swindler. The researchers' adviser is Dr. Frank DiSilvestro. *You* may ask any questions that you have now, in class, and if you have questions later, you may contact them at mswin001@waldenu.edu or fdisilve@waldenu.edu.

The Research Participant Advocate at Walden University is Leilani Endicott, and you may contact her at 1-800-925-3368, extension 1210, if you have questions about your participation in this study. You will receive a copy of this form from the researcher.

Statement of Consent:

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

Printed Name
of Participant,
first and last
name

Signature of participant

Signature of
parent or guardian (when applicable) Date:

Signature of Researcher: Date:

APPENDIX G: PARENT/GUARDIAN CONSENT FORM

Dear Parents/ Guardians,

Your students are invited to participate in a research study. The following questions may help you to better understand this study and form:

What is the reason for the study?

Sometimes Math is a difficult subject for students. The study is designed to better understand what might be difficult in Math, and why it might be difficult.

Who is conducting the study?

This study is being conducted by Marsha Swindler, a PhD university student.

Why is my student invited to participate?

Your student is invited to participate in this study because your student is a high school student in an Algebra class this semester, and has an Individual Education Program (IEP) supervised by the special education department.

What is the purpose of the study?

The purpose of the study is to discover if specific teacher training to better understand students with identified learning disabilities will affect the academic success of resource inclusion students in a mainstream Math class like the one your student is enrolled in this semester.

Who are the other participants in this study?

The students who have registered for Algebra this semester are being asked to participate in this study. Therefore, your student's fellow classmates who offer their consent will also be participating in this study.

What will be asked of my student if I decide to participate in this study?

If you agree to give permission to participate in this study, your student will: 1) do what the Math teacher requires according to the class syllabus from the teacher, and 2) take an informational inventory in special education class that helps students to discover their own individual strengths in learning. The inventory will take less than 30 minutes, and the results will give the students information about learning styles that can be used in all classes in the future. The researcher will use the results in a chart to compare the different learning styles as the student will use an identification number on the form and not a name.

How long will this study last?

The study will last one quarter. It will begin during the fall of the 2006-2007 school year, as soon as you give permission, and end on the last day of the semester in January, 2007.

What about my student's right to privacy, and will the results stay private?

The records of this study will be kept private. The researcher will not see any student's name on the work submitted, and will not know who the students are. They will write their ID number and name on tests and assignments, and the teacher will take the name off before the researcher sees any grades on any tests, assignments, or projects. If any report of this study might be published, the researcher will not include any information that will make it possible to identify a participant. Research records will be kept in a locked file, and only the researcher will have access to the records.

What can I expect by giving permission for my student to participate in this study?

You can expect that your student's Algebra class is the same whether there was a study or not. The only difference will be that if you give permission for your child to participate, his or her test scores and semester grade will be submitted to the researcher, and your child will be given the informational inventory in special education class. There are no risks by participating in this study, and there are no compensations for participating.

What are my rights?

If you decide to give your permission for participation in the study, you have the right to withdraw your permission from the study later if you change your mind. If you do this, your child's grade will not be submitted to the researcher, and your child will not complete the information inventory, but your student will still be required to finish the requirements from the teacher to complete the course. Your decision as to whether or not participate will in no way affect your child's grade in that class.

Is there anyone I can contact should I need to?

Yes. The researcher conducting this study is Marsha Swindler. The researchers' adviser is Dr. Frank DiSilvestro. You may contact them at mswin001@waldenu.edu or fdisilve@waldenu.edu.

The Research Participant Advocate at Walden University is Leilani Endicott, and you may contact her at 1-800-925-3368, extension 1210, if you have questions about your participation in this study. You will receive a copy of this form from the researcher.

Statement of Consent:

I have read the above information. I have asked questions and received answers. I consent for my student
to participate
in the study.
Printed Name of Participant, first and last name
Signature of participant

Signature of
parent or
guardian (when applicable) Date:

Signature of Researcher: Date:

APPENDIX H: RUBRIC FOR INCLUSION MATHEMATICS STUDENTS

Student I.D. Number: _____ Instructor: _____
Evaluator: _____ Date: _____
(Check or elaborate)
Student:
works independently _____
uses printed textbook _____
solves problems on paper _____
uses computer software to solve problems _____
communicates with instructor during class(e.g. raises hand) _____
asks for assistance or help from other students _____
asks for assistance or help from instructor _____
works with one or more other students in solving problems _____
verbalizes dissatisfaction _____
verbalizes satisfaction _____
uses other technology (e.g. calculator) to solve problems _____
accesses teacher generated study notes _____
appears frustrated using teacher generated study notes _____

OBSERVATION NOTES: List in detail any specific examples of behavior from the student that relates to the learning experience, positive or negative, that occurs or has occurred during the first semester of the course.

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

OPINION: List in detail (continue on the back) any helpful suggestions/strategies. Please elaborate. _____
_____
_____
_____
_____

CURRICULUM VITAE

MARSHA SWINDLER

EDUCATION

Ph.D. September 2007 Walden University
Education: Special Education
M.A. January 2002 Azusa Pacific University
Education: Teaching
B.A. May 2000 Azusa Pacific University
Human Development

EMPLOYMENT

Don Julian Elementary 5th Grade (Immersion): teacher Sept 2001—January 2004

Arcadia High Resource English and Investigating Math: teacher Sept 2000—June 2001

Arcadia High School, Arcadia, CA: Instructional Assistant Sept 1994—June 2000

Assisted, interacted with and implemented alternative learning-specifically Math, along with direct student intervention in Math and Science programs

Arcadia High School-Summer School: Instructional Assistant June 1985—August 1995

Assisted, interacted with, and informal counseling of resource students

Assisted, designed, and implemented alternative learning program: Math and Science

Dana Junior High School: Instructional Assistant Sept 1983—June 1994

Observed and interacted with faculty/staff concerning resource students

Assisted, designed, and implemented alternative learning-specifically Math

RESEARCH INTERESTS

- Relationship of the theory of Multiple Intelligences and inclusion student learning styles
- Relationship of student learning styles and strategies: specifically in mathematics courses
- Designing online communication between inclusion mathematics students and teachers
- High school mathematics teacher resistance to alternate instruction for all levels of learners

LANGUAGES

Spanish

PROFESSIONAL MEMBERSHIPS

Association of Supervision and Curriculum Development (ASCD)
National Council of Teachers of Mathematics (NCTM)
Pi Lambda Theta: International Honor Society and Professional Association in Education