

EVIDENCE BASED INTERVENTIONS: AN EXAMINATION OF PRE-SERVICE
TRAINING, PROFESSIONAL DEVELOPMENT, AND CLASSROOM IMPLEMENTATION

A Dissertation

by

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This dissertation meets the standards for scope and quality of
Texas A&M University-Corpus Christi and is hereby approved.

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ABSTRACT

This descriptive correlational study was conducted to examine the current level of pre-service training, professional development and classroom implementation of evidence based interventions (EBIs) at an urban school district in South Texas. The purpose of the study was to examine the relationship between EBI training for special education teachers and their practice of classroom interventions for children with an autism spectrum disorder (ASD). Evaluating the usage of EBIs in the classroom is imperative because of the many obligations educators have to uphold federal compliances (DOE, 2011). Children with ASD are a growing population and it is imperative school districts comply with both federal and state mandates to avoid legal conflicts with parents and other penalties from government agency due to non-compliance (Tincani, 2007). Additionally Grossman and Barrozo (2007) urged professionals to recognize there is a “... moral and ethical obligation to identify, treat and care for people with autism spectrum disorders so that they can attain their full potential” (p. 9).

Forty-four special educators participated in online questionnaire to report their current level of pre-service training, professional development training and implementation of 24 evidence based interventions (EBIs) recommended by the National Professional Development Center for Autism Spectrum Disorders (ASD).

Statistical analysis of the study found a strong correlation between special educator training and classroom implementation of EBIs. First, although there are low to intermediate correlations of statistical significance between pre-service training and implementation of EBIs, there are strong correlations of statistical significance between professional development and implementation of EBIs. Second, when considering demographic background, teachers with six

to ten years of experience, particularly teachers with experience teaching autistic children, reported greater implementation of EBIs that were statistically significant than teachers in other groups. Third, teachers reported low percentages of pre-service training but frequent professional development toward of EBIs. Results indicated implementation based on pre-service training to be less than 30% for a majority of the EBIs and up to 50% based on professional training. Although the implementation levels are intermediate, there is still potential for growth.

The responsibility of educational leaders today is to develop purposeful professional development that equips special educators with the tools to meet the needs of students diagnosed with an ASD. Teacher preparation programs and professional development trainings are opportunities to provide special educators with the fundamental skills, strategies, and resources needed to operate a classroom effectively. The prognosis students diagnosed with an ASD can be life altering when strategic educational planning takes place that incorporates a variety of evidence based interventions to meet the needs of the individual student.

DEDICATION

This dissertation is dedicated to my sweet son Noah Paul Aldrighetti. His struggles with autism in the educational system ignited my quest to impact educational programs for students diagnosed with autism. His unique character and intelligence taught me to always focus on discovering a student's abilities.

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My mother, Barbara Benavidez always taught me the importance of obtaining an education and has been a source of encouragement in achieving my bachelor's, master's, and now doctoral degree. My aunts and uncles have served as role models throughout my life and taught me how to impact the life of a child. My grandmother, Maria Perales, went to school during a time that was very challenging for the Hispanic community. She ultimately decided to end her academic career due to racial pressure. From her hardship, she encouraged me to take pride in who I am and affirmed my talent. My husband, Craig Hoover has done what ever necessary to give me the time and space to complete tasks needed to complete my doctoral degree. And my two beautiful sons, Noah and Seth, have taught me to believe all things are possible with God. Also,

I am very thankful to the teachers who are in the classroom doing their best to deliver quality education to meet students' diverse abilities.

TABLE OF CONTENTS

| CONTENTS | PAGE |
|-------------------------------------|------|
| ABSTRACT..... | v |
| DEDICATION..... | vi |
| ACKNOWLEDGEMENTS..... | viii |
| TABLE OF CONTENTS..... | ix |
| LIST OF TABLES..... | xii |
| Chapter I..... | 1 |
| Background and Setting..... | 1 |
| Theoretical Framework..... | 3 |
| Purpose of the Study..... | 4 |
| Definition of Terms..... | 5 |
| Glossary of Terms..... | 8 |
| Limitations and Delimitations..... | 9 |
| Assumptions..... | 10 |
| Significance..... | 10 |
| Chapter II..... | 12 |
| Literature Review..... | 12 |
| Summary..... | 12 |
| Autism Spectrum Disorder (ASD)..... | 13 |

| | |
|--|----|
| Individuals with Disabilities Act (IDEA) | 15 |
| No Child Left Behind (2001) | 18 |
| Legal Issues | 20 |
| Evidence-Based Interventions (EBIs) | 22 |
| College of Education | 26 |
| Professional Development | 28 |
| Educational Climate | 30 |
| Chapter III | 32 |
| Introduction | 32 |
| Design | 33 |
| Participant Selection | 34 |
| Instrumentation | 35 |
| Data Collection | 37 |
| Data Analysis | 38 |
| Assumptions | 39 |
| Chapter IV | 41 |
| Results | 41 |
| Descriptive Results | 42 |
| Statistical Assumptions | 46 |
| Research Questions | 47 |

| | |
|--|-----|
| Summary | 87 |
| Chapter V | 87 |
| Introduction..... | 88 |
| Discussion | 101 |
| Implications..... | 112 |
| Future Research | 115 |
| Summary | 118 |
| References | 119 |
| Appendix A: Invitation | 126 |
| Appendix B: Consent Form | 127 |
| Appendix C: Evidenced Based Intervention Questionare | 128 |
| Appendix D: Outside Research Approval..... | 136 |

LIST OF TABLES

| TABLES | PAGE |
|---|------|
| Table 1 Age of Participants..... | 43 |
| Table 2 Gender of Participants | 43 |
| Table 3 Participant Level of Education, | 44 |
| Table 4 Participants Certification | 44 |
| Table 5 Participants Alternatively Certified | 44 |
| Table 6 Participants Education Delivery Method..... | 45 |
| Table 7 Participants Teaching Experience..... | 45 |
| Table 8 Participants Teaching Experience with ASD..... | 46 |
| Table 9 Participants Education Setting | 46 |
| Table 10 Participants Teaching Assignment..... | 47 |
| Table 11 Participants Ethnicity | 47 |
| Table 12 Correlation of Pre-service Training and Classroom Implementation..... | 49 |
| Table 13 Correlation of Professional Development and Classroom..... | 52 |
| Table 14 Correlation of Pre-service Training from a Traditional 4-year Program..... | 54 |
| Table 15 Correlation of Pre-service Training from an Alternative Certification Program..... | 56 |
| Table 16 Pivotal Response Training | 58 |
| Table 17 Video Modeling | 59 |

| | |
|---|----|
| Table 18 Gender and Classroom Implementation | 61 |
| Table 19 Years of Teaching Experience and Classroom Implementation..... | 62 |
| Table 20 Years of Teaching Experience Students with ASD and Classroom Implementation..... | 64 |
| Table 21 Individual Differences among Years of Teaching Experience | 64 |
| Table 22 Differences among Current Level of Students | 66 |
| Table 23 Differences among Current Level of Students | 66 |
| Table 24 Educational setting and Impact on Pre-service Training | 71 |
| Table 25 Ethnicity and Impact on Pre-service Training | 75 |
| Table 26 Age and Professional Development with EBIs..... | 78 |
| Table 27 Gender and Professional Development with EBIs | 80 |
| Table 28 Certification and Professional Development with EBIs | 82 |
| Table 29 Alternative Certification and Professional Development with EBIs | 83 |
| Table 30 Teaching Experience Students with ASD and Professional Development with EBIs ... | 86 |
| Table 31 Educational setting and Professional Development with EBIs | 88 |

Chapter I

Background and Setting

The World Health Organization referred to Autism Spectrum Disorders (ASD) as “the fastest growing neurobiological condition in the world” (2007, p. 9). ASD is the leading diagnosis for children with more cases than childhood cancer, diabetes, and pediatric AIDS all together (Batista, Christodulu, Crawley, DeLuke, Frye, & Llaneza, 2010). ASD was once considered a rare childhood physiological disorder that first emerged in the 1940s, but did not receive widespread attention until the early 1990s. In our nation today, approximately 1 out of 88 children is reportedly diagnosed with ASD (National Center for Disease Control [NCDC], 2013), an area requiring much more research (National Institute of Child Health and Human Development [NICHD], 2005).

The No Child Left Behind Act (NCLB) in 2001 and amendments to the Individuals with Disabilities Act (IDEA) in 2004 commissioned an evolutionary movement that opened the doors for children with ASD (US Department of Education [DOE], 2011). The dynamics of these acts prompted a progressive demand in education as more students in special education were placed in general education classes, had the opportunity to be exposed to grade level curriculum, and were required to participate in state assessments (Bowen et al., 2011). Furthermore, teachers were called to a higher level of standards of accountability for both students in general and special education (Tincani, 2007). Tincani (2007) explained that educators needed to adapt to the changes because federal mandates demanded an increase in their level of expertise. Carnhan et al. (2011) and Larsson et al. (2003) expressed the complexity and variability of ASD creates challenges in education planning. Additionally, educational planning must be customized to each child’s learning style and learning goals connected to evidence based interventions (EBIs)

all of which require quality training (Tincani, 2007). Due to the rising number of cases of children with ASD, measuring the interventions used by professionals that work with children on the ASD is critical (Batista et al., 2010).

Statement of the Problem

The purpose of the study was to examine the relationship between EBIs training for special education teachers and their practice of classroom interventions for children with ASD. Evaluating the usage of EBIs in the classroom is imperative because of the many obligations educators have to uphold federal compliances (DOE, 2011). Children with ASD are a growing population and it is imperative school districts comply with both federal and state mandates to avoid legal conflicts with parents and other penalties from government agency due to non-compliance (Tincani, 2007). The number of students identified with ASD in public schools skyrocketed from 5,000 in 1991 to 94,000 in 2001 (Bowen et al., 2011). Then from 2002 to 2008 the Center for Disease control reported another 78% increase in the population of children diagnosed with ASD in the United States (CDC, 2012). The rapid increase in occurrences has prompted schools to review the manner in which they strategize individual educational plans (Simpson, 2004). Evaluating EBIs training needs is a matter of urgency because implementation of EBIs for students with ASD is mandated by federal law (Collet-Klingenberg, Hatton, Odom, & Rogers, 2010).

Theoretical Framework

The study used evidence based interventions (EBIs) as a theoretical framework. As a theory EBIs is defined as an intervention that is derived from an experimental or quasi-experimental design (DOE, 2011; NPDC-ASD, 2011). The U.S. Department of Education requires EBIs contain the following components in their data process: (a) empirical methods; (b) rigorous data analysis; (c) reliable data methods; (d) duplicated studies; and has (e) had undergone a peer review (DOE, 2011). Public policies such as NCLB and the IDEA support EBIs in mandating public schools to implement EBIs in both educational planning and classroom implementation for all students with ASD (DOE, 2011). Based on the federal criteria of EBIs the National Professional Development Center for Autism Spectrum Disorders (NPCD-ASD) have identified 24 EBIs that are considered best practices by federal and professional standards (NPCD-ASD, 2012). This study used the 24 best practices identified by NPCD-ASD as a measurement tool in the study.

The NPDC-ASD has designated a panel of experts to review submitted studies as part of the process in identifying interventions that demonstrated reliability and validity (NPDC-ASD, 2011). NPDC-ASD integrated criteria used the 24 EBIs to align with the federal mandates definition of EBIs (Collet-Klingenberg et al., 2010). The NPDC-ASD employed similar principles in evaluating research studies developing a rigorous process to identify the 24 EBIs (Collet-Klingenberg et al., 2010) of which the EBIs are considered to have elements embedded in their study (NPDC-ASD, 2011):

- (a) randomized or quasi-experimental design studies. Two high quality experimental or quasi-experimental;

(b) single subject design studies. Three different investigators or research groups must have conducted five subject design studies, or

(c) combination of evidence. One highly quality randomized or quasi-experimental group design study subject design studies conducted by at least three different investigators or research groups.

(NPDC-ASD Evidence Based Interventions, para. 4)

The usage of EBIs created a systematic approach in educational planning and decision making due to the level of expertise and rigor to obtain intervention outcomes (Hutzler, 2011). It is mandated that educational teams establish and integrate EBIs with goals set by the student's individual education plan (IEP) to ensure fealty in upholding federal mandates (DOE, 2007). EBIs are deemed and regarded as best standard practices (Hutzler, 2011). Simpson (2004) indicated the lack of utilization EBIs may hinder the educational prognosis for students diagnosed with ASD.

Purpose of the Study

The purpose of the study was to examine the relationship between EBIs training for special education teachers and their practice of classroom interventions for children with ASD. Teachers can receive special education training two ways. One way is through a traditional college education. A second way is through alternative certification. The study, then will examine the use of EBIs by both groups to understand further how training might affect the use of EBIs. The study is guided by the following questions:

1. What is the correlation of pre-service training and classroom implementation of EBIs?
2. What is the correlation of professional development and classroom implementation of EBIs?

3. What is the correlation of pre-service training from a traditional four-year college and classroom implementation of EBIs?
4. What is the correlation of pre-service training from an alternative teacher certification program and classroom implementation of EBIs?
5. How do demographics differ in their impact of classroom implementation of EBIs?
6. How do demographics differ in their impact on pre-service training?
7. How do demographics differ in their impact on professional development?

Definition of Terms

The terms were defined according to the construct and operational definitions used in the study in which they are divided into independent and dependent variables.

Independent Variables

The two levels of training were designated to evaluate the relationship between special educator teacher training and the application of EBIs.

1. Pre-service training: The construct definition is the educational training a teacher receives prior to their career as an educator on the following topics: law policies, instructional strategies, lesson planning, and classroom management (Texas Education Agency [TEA], 2012). This study will explore pre-service training either received while attending a four-year university or an alternative certification program. The operational definition of pre-service training is determined by the category in which participants choose to respond to EBIs. For example, a participant is asked to respond to an EBI statement on a scale of 1 to 6 (1 = none; 2 = rarely—less than 10%; 3 = occasionally—up to 30%; 4 = frequently—up to 50%; 5 = usually—up to 70%; 6 = extensive—up to 90% or more) in one of three categories: Unknown terminology; Pre-service; or Professional Development.

2. Professional Development Training: The construct definition refers to in-service training a teacher receives while working for a school district (Gordon & Ross-Gordon, 2009). Professional Development programs are designed to be ongoing, to develop teacher skills, and present information that is research based (2009). The operational definition of professional development in-service training is determined by the category in which participants choose to respond to EBIs. For example, a participant is asked to respond to an EBI statement on a scale of 1 to 6 (1 = none; 2 = rarely—less than 10%; 3 = occasionally—up to 30%; 4 = frequently—up to 50%; 5 = usually—up to 70%; 6 = extensive—up to 90% or more) in one of three categories: Unknown terminology; Pre-service; or Professional Development.

3. Implementation of EBIs in the classroom- The construct definition refers to the application of EBIs special educations use when working with students diagnosed with ASD to acquire skills that can be measured and described (Collet-Klingenber et al., 2010). The operational definition of classroom interventions is determined by the category in which participants choose to respond to EBIs. For example, a participant is asked to respond to an EBI statement on a scale of 1 to 6 (For example, a participant is asked to respond to an EBI statement on a scale of 1 to 6 (1 = none; 2 = rarely—less than 10%; 3 = occasionally—up to 30%; 4 = frequently—up to 50%; 5 = usually—up to 70%; 6 = extensive—up to 90% or more) in one of two categories: Unknown terminology; Implement in the classroom.

4. Demographics: The construct definition relates “to information about demographics, social characteristics, and economics of children and school districts from the National Center for Education Statistics (NCES) of the U.S. Department of Education” (School District Demographic System, para. 1). The operational definition of demographics include (a) age; (b) gender; (c) level of education; (d) certification; (e) educational program; (f) education delivery

method; (g) years of teaching experience; (h) years of teaching experience with autism; (i) educational setting; (j) teaching assignment; and (k) ethnicity.

The age category is operationally defined as the participants' choices for 22-30, 31-40, 41-50, 51-60, or 61+ years.

The gender category is operationally defined as the participants' choices for female or male.

The level of Education category is operationally defined as participant choices for bachelors, masters, or doctoral degrees.

The certification: The construct definition refers to state requirements for special education certification. The operational definition is a choice on the survey of whether a participant received special education certification from a college education or alternative certification.

The educational program category is operationally defined as the participants' choices for teaching educational program which included: not alternatively certified, college/university, service center, and other category.

The educational delivery method category is operationally defined as the participants' choices for obtaining their education which include: face-to-face, online, and hybrid categories.

The years of Teaching Experience is operationally defined as participants' choices for first year teacher, 1-5 years, 6-10 years, 10-20 years, or 21+ years.

The years of teaching children with ASD is operationally defined as participants' choices for first year teacher, 1-5 years, 6-10 years, 10-20 years, or 21+ years.

The educational setting participants educate is operationally defined as participants' choices for elementary, middle school, or high school students.

The participants current job assignment is operationally defined as participants choices for Inclusive/Co-Teaching environment, Adaptive education environment, Resource environment, or Program for Academic Language Support (PALs) unit.

The race/ethnicity category is operationally defined as the participants' choices for White, Black, Hispanic, Native American, Asian, Pacific Islander, or Indian subcontinent.

Dependent Variables

The operational definition of which the level of frequency of each researched based intervention as indicated by the participants and is identified as practice of classroom interventions.

Classroom interventions: The construct definition is based on this theory the National Professional Development Center for Autism Spectrum Disorders (NPCD-ASD) have identified 24 EBIs that are considered best practices (NPCD-ASD, 2011). The practice of classroom interventions were measured by a six-point scale to indicate the frequency of classroom application of each of the 24 best practices, EBIs statements on a scale of 1 to 6 (1 = none; 2 = rarely; 3 = occasionally; 4 = frequently; 5 = usually; 6 = extensively). An example statement referring to training and implementation is "Functional Behavior Assessment (understanding possible reasons for behavior)".

Glossary of Terms

Autism Spectrum Disorder (ASD)-neurological disorder that impedes communication, social interactions, behavior, and learning styles; intellectual abilities and severity of this disorder range on a broad spectrum (CDC, 2011).

Evidence Based Interventions (EBIs)-educational interventions that are supported with empirical research and that has been reviewed among peers systematically (NPDC-ASD, 2011).

Individual Educational Planning (IEP)-mandated by the Individuals with Disabilities Act amendment is personalized education planning for children with special needs to have academic goals aligned with EBIs to measure student growth; as well as transitional planning upon graduation (DOE, 2007).

Individuals with Disabilities Education Act (IDEA)-previously named Education for All Handicapped Children's Act (EAHCA), is an act that impacted the quality of instruction children with disabilities received as well as established student and parent rights. IDEA granted students the right to a free and appropriate education (FAPE), established safeguards for students regarding their educational planning, and allocated funding for student services (DOE, 2011; Weber, 2011). Under IDEA a student has the right to be evaluated academically, receive tailored instruction that includes the usage of EBIs, and must undergo state wide assessments to assess student progress (DOE, 2011).

Interventions- strategies to acquire skills that can be measured and described (Collet-Klingner et al., 2010).

No Child Left Behind Act 2001 (NCLB)-Landmark act that began an accountability assessment system for schools that initiated EBIs to be mandate for children classified in the special education program (DOE, 2011).

Strategies-facilitates direction, tools, and steps that support students academically (Collet-Klingner et al., 2010).

Limitations and Delimitations

The study included a non-probability sampling; the external validity is limited to the participants of the study. Due to time constraints the study was limited to one school district with a population of 261 special education teachers (TEA, 2013). The sample size was 44

special education teachers who participated in the study. In addition, due to the non-experimental nature of the study, no casual inferences were drawn or generalizations to EBIs for children with ASD. In future studies a larger sample size and number of school districts should be considered.

Assumptions

Safeguards were developed in this study to create a confidential atmosphere for participants of the study. Reports of the results were based on population demographics; individual and district identity will not be revealed in any context of the study. Participants were not required to enter any information that would reveal their identity. In addition, the participants were informed that the study was not connected with the district and was independent of any employment related issues with the district. The researcher assumed participants provided accurate responses to the survey items. Special educators were expected to provide an honest account of their current practices and training.

Significance

Examining the relationship between training and practice of EBIs is critical information for districts because it aids educational leaders in developing quality educational plans and in maintaining federal compliance (Collet-Klingenberg et al., 2010; DOE, 2011). There exists a need for practitioners to identify empirically proven effective strategies and evaluate the application to each individual student (Simpson, 2004). Educational programs for students with ASD must include classroom implementation of EBIs (DOE, 2012). Effective in-service professional development training is achieved when individual districts identify the direct training needs of their educators (Whitmer, 2013). Quality professional development planning requires educational leaders to focus on pragmatic based data (Fogarty & Brian, 2009). Districts

must evaluate the training needs their special education team when designing and creating an effective a professional development series in tailoring learning opportunities that would be most beneficial for staff and students (Fogarty & Brian, 2009). According to Collet-Klingenberg et al. (2010), EBIs should be carefully plotted by educational leaders and be part communicated as standard practice with logical tangible steps with measurable gains. Forgarty and Brian (2009) and Guskey (2009) agreed that it is the duty of educational administrators identify EBIs, communicate them as standard practices, and embed EBIs into professional development series (Fogarty & Brian, 2009; Guskey, 2009). Professional learners, such as special educators, respond to data-driven feedback based in relation to their training and implementation of EBIs (Fogarty & Brian, 2009). Eason (2008) stated they use the information to improve their current practice. When teachers have the time to reflect on their current practices and challenges along with the direction of their administrators, they can come up with applicable solutions (Lieberman & Wilkins, 2006).

The data collected from this study provided an indication of the level of training reported by special education teachers on EBIs for children with ASD for both pre-service and in professional development trainings in an urban school district. Furthermore, the statistical analysis of correlation between training and classroom application of EBIs should identify potential areas of need for training to support special education teachers.

Chapter II

Literature Review

Summary

Students are entering the classrooms with a new set of challenges and it is viable to prepare teachers by evaluating areas of training needs (Easton, 2008). The number of students identified with ASD in public schools skyrocketed from 5,000 in 1991 to 94,000 in 2001 (Bowen et al., 2011). Then from 2002 to 2008 the Center for Disease Control reported another 78% increase in the population of children diagnosed with ASD (2011). The rapid increase occurrences of students diagnosed with ASD has prompted schools to review the manner in which they strategize individual educational plans (Simpson, 2004). School districts are now required to provide appropriate individualized interventions for children with ASD (Collet-Klingenberg et al., 2011) through the authorization of NCLB 2001 and IDEA 2004 (DOE, 2011). ASD was initially viewed as a diagnosis whose prognosis equated to an inability to function in neither educational nor any social settings (Simpson, 2004). Historically, educational planning for special educators did not include research-based interventions and methodologies until the authorization of NLCB 2001 (Simpson, 2004).

This study examined the relationship between training on EBIs and the practice of classroom interventions. The level of teacher training is a critical component of student success (Guskey, 2009). Through the process of examining the current climate that encompasses educating students diagnosed with ASD, theoretical gaps were identified based on current practices. The degree of EBIs applied in a classroom can be used to identify areas of professional development topics special educators may need. The assessment of the level of training received for both pre-service and in-service professional development is imperative, as

these are the settings where special educators receive the knowledge and tools that enable them to comply with federal legislation (Collet-Klingenberg et al., 2010; DOE, 2011). Educational institutions that use strategies which lack empirical support may impede the development and progress for students with an ASD (Simpson, 2004).

Autism Spectrum Disorder (ASD)

Autism Spectrum Disorder (ASD) is identified as a medical condition in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV). Diagnoses located under ASD include: Autistic Disorder, Asperger's Disorder, Childhood Disintegrative Disorder, Rett's Syndrome, and not otherwise specified (PDD-NOS) (4th ed., text rev.; DSM-IV-TR; American Psychiatric Association, 2000). An individual diagnosed with Autistic Disorder demonstrates impairments with social interactions, language developmental delays, and have repeated motor or vocal patterns (4th ed., text rev.; DSM-IV-TR; American Psychiatric Association, 2000).

Additionally, the diagnostic criteria for Autistic Disorder includes: meeting six items in the diagnostic manual, with at least one item in each category; and the category social impairments must include two (2000). Asperger's Disorder diagnostic criteria must include two items in social impairments category, as well as exhibit repetitive behavior patterns (2000). Childhood Disintegrative Disorder (CDD) describes a condition where a child is developing normally socially, language development, and behaviorally and suddenly loses two or more skills in the following areas: language, behavior, bowel control, play and/or motor skills (2000). Individuals with CDD have impairments in at least two of the following areas: language development, social skills, and/or behavioral (2000). A child with the diagnosis of Rett syndrome would have had typical development at least until the age of 5 months (2000). After the onset of Rett's syndrome a child will experience a decrease rate of head growth and loss of developmental, language skills,

and social skills (2000). Individuals diagnosed with pervasive development disorder not otherwise specified (PDD-NOS) possess significant impairments in communication, social interactions, and behavioral patterns, but do not meet the criteria for any other diagnosis under ASD in the DSM-IV (2000). In some cases mental handicaps or other medical complications can co-exist within a child diagnosed with ASD (Gabriels & Noland, 2004). The commonalities of these further defined diagnoses are the social, communication, and developmental delays, which could impact these individuals for their entire lifetime and greatly impact their academic experience (Gabriels & Noland, 2004).

ASD continues to affect an increasing rate of children (Batista et al., 2010; Blumberg, Boyle, Ghandour, Kogan, Perrin, Singh, Strickland, Trevathan & van Dyck, 2009; Larsson et al., 2003). In the United States, the Center for Disease Control (CDC) estimated 1 in 88 children is diagnosed with ASD (NCDC, 2013). The average age range a child is diagnosed with ASD is between three and seven years old (Batista et al., 2010). Boys are more likely to be diagnosed than girls with an ASD ratio of 4:1 (Blumberg et al., 2009). A large portion of students diagnosed with ASD have challenges cognitively, and an estimated 33% of individuals with ASD are diagnosed with non-verbal conditions (Ryan et al., 2011). Children diagnosed with ASD can be categorized as high functioning and low functioning depending on their communication deficits to include expression, behavior, and social interactions (Batista et al., 2010). In a recent national survey, 49.6% of parents described the severity of ASD in their child as mild; 33.9% reported intermediate severity, and 16.5% were considered severe (Blumberg et al., 2009).

Students diagnosed with ASD function best in structured environments and have difficulty responding in situations that are spontaneous or do not reflect the child's desired

outcome (Carnhan et al., 2011). Although children with ASD thrive with daily routines, they also have difficulty learning a routine event (Carnhan et al., 2011). Another challenge of a child with ASD includes the fixation on a special interest the child possesses (Carnhan et al., 2011). This can be helpful to assist in engaging students in instruction, but these interests can sometimes hinder their ability to respond appropriately or transition between activities (Carnhan et al., 2011). Students diagnosed with ASD have to confront barriers socially, behaviorally, and academically (Batista et al., 2010; Blumberg et al., 2009). Characteristics of an individual with ASD may include developmental impediments with social interactions, communication language acquisition, behavior, and sensory integration (Ryan, Hughes, Katslyannis, McDaniel, & Sprinkle, 2011). Impairments of these language developments can compromise a child with ASD's educational experience (Carnhan, Christman, & Williamson, 2011). However, knowledge of ASD and application of EBIs lead to children with ASD having healthy and productive lives (NICHD, 2005).

Educational planning for a child diagnosed with ASD calls for high-level knowledge of the neurological elements of ASD along with the response of providing appropriate EBIs by special educators (Batista et al., 2010). Due to the variability of ASD, educational planning must be customized to each child's learning style with learning goals connected to EBIs by trained professionals (Carnhan et al., 2011; Larsson et al., 2003). Currently, there is not a cure for ASD and there are limited successful interventions (Batista et al. 2010).

Individuals with Disabilities Act (IDEA)

In 1970 about 1.75 million children in America diagnosed with any audio or visual impairment, emotional disturbances, or mental handicaps were unable to receive an education because many states had laws that did not allow those students to attend public school (DOE,

2011). Another 2.5 million students a disability who were able to attend school were placed in programs that did not address their educational needs (Weber, 2011). Additionally, large populations of individuals with disabilities during this time were institutionalized given bare essentials to exist such as food, shelter, and clothing (2011). In 1967 approximately 200,000 individuals with a disability were institutionalized (2011). The lack of access and opportunity created colossal barriers in acquiring any type of education for a child with a disability (DOE, 2011).

During the 1950s and 1960s the federal government initiated programs to support the educational needs of students with disabilities (2011). Such movements included: The Captioned Films Acts of 1958, Training of Professional Personnel Act of 1959, and Teachers of the Deaf Act of 1961 (2011). The focus of these programs was educator training to assist those who taught students diagnosed a disability (2011). The federal government continued to respond to the needs to students with disabilities through the Elementary and Secondary Education Act of 1965 and the State Schools Act provided states with direct grant assistance to help educate children with disabilities which allocated funds to expand educational opportunities for students to receive special education services.

These legislative acts are the foundation of IDEA. However, the mission of establishing can also be attributed to those who persevered. Congressmen John Brademas and Walter Mondale spearheaded a coalition that changed history and opening up the school doors to students with disabilities through questioning the law that defined special education (Cross, 2004). This was not a simple feat in that when the initial legislative bill that addressed education for children with disabilities passed through U.S. Congress, it was vetoed in the White House by President Nixon, twice (Cross, 2004). In addition, they worked to gain the support of a few high

profiled Congressmen and allied with parent groups until the bill was finally passed in 1975 (Cross, 2004). John Brademas and Walter Mondale were persistent and redrafted the bill several times (2004). Cross (2004) explained how they finally passed the bill by changing the language of the bill to closely match the Civil Rights Act of 1964. In 1975, the Education for all Handicap Children's Act (EHCA) of was enacted, establishing student and parental rights for all children with disabilities in the public school setting (DOE, 2011).

In 1990, EHCA was renamed to the Individuals with Disabilities Act (DOE, 2011). In the same year autism was added to the list of eligible disabilities covered under IDEA (Ryan et al., 2011). IDEA granted students the right to a free and appropriate education (FAPE), provided funding for student services (DOE, 2011; Weber, 2011), and established safeguards for students regarding their educational planning (Yeager et al., 2000). FAPE also prohibited school systems from denying students due to their disability and mandated districts to provided appropriate educational programs (Weber, 2011). IDEA also mandates that students identified with an eligible disability receive individual educational planning and services to have students reach set goals (Wilson, 2006). Under IDEA a student has the right to be evaluated academically, receive tailored instruction with EBIs support, and must undergo statewide assessments to assess student progress (DOE, 2011). IDEA dictates and regulates parental rights, construction of IEPs, least restrictive environments for students, assistance for districts, assessments, assurances (Yeager et al., 2000) and dispute resolution protocols (Weber, 2011).

The Admissions, Review, and Dismissal (ARD) committee is responsible for setting yearly goals and objectives that integrate EBIs and comply with IDEA (Tincani, 2007; Yeager et al., 2000). ARD committees are a specific term used in Texas. Outside of Texas ARD committees can also be referred to as IEP teams. Members consist of school administrators,

school psychologists, special educators, general educators, and parents (Tincani, 2007). The IEP team is responsible for developing individualized educational planning and selecting appropriate EBIs (Tincani, 2007). The committee makes decisions for the participation of state testing, accommodations, and alternative assessments (TEA, 2011). Parents today are more knowledgeable of EBIs and are holding school districts accountable for the interventions that are used (Tincani, 2007).

The revolution of education for students with disabilities has evolved in the past 37 years (DOE, 2011). IDEA has been a progressive movement. Historically, children with disabilities in the public education system had limited access to grade level curriculum and state assessments (Wilson, 2006). Over time IDEA has undertaken amendments that addressed educational needs such as: early intervention, vocational training, transitional planning, funding training, least restrictive environment and assessments (DOE, 2011). The effects of IDEA have been significant graduation rates for students diagnosed with a disability increased 14% over a 10-year period (2011). Additionally, IDEA effects have been noted even after students have graduated (2011). Employment rates for individuals with disabilities have doubled; and students pursuing postsecondary education have tripled (2011). IDEA has created more opportunities for students with disabilities as seen in the increasing rates of graduation, employment, and postsecondary enrollment.

No Child Left Behind (2001)

On January 8, 2001, President George W. Bush signed the No Child Left Behind Act of 2001(NCLB), which set standards for student achievement, assessment, performance, and quality of educators (DOE, 2011). NCLB was the government's response to a decline in student performance prompted in certain subpopulations (DOE, 2011). This initiated educators to

become more accountable for both students in general and special education along with a standardized assessment system to monitor student progress (NCLD, 2009; Wilson, 2006). Before NCLB students in special education were limited to the access of general education curriculum and state assessments (Bowen et al., 2011). NCLB began the process in reformation in special education igniting the amendments of IDEA mandating the use of research based intervention and least restrictive environments (LRE) in the placement setting for children with disabilities (Tincani, 2007). NCLB federally mandated the use of researched-based interventions and methodologies to their current practice (National Center of Learning Disabilities [NCLD], 2009). Prior to NCLB no set standard of intervention was required (Tincani, 2007).

NCLB also required educational professionals and leaders to become professionally obligated to expand their knowledge base to improve their standard practices with the utilization of EBIs (Busby et al., 2010; DOE, 2007; NCLD, 2009). In addition, NCLB mandates that teachers are deemed highly qualified professionals (Busby, Ingram, Bowron, Oliver, & Lyons, 2012; Courtade et al., 2010; Strain, Schwartz, & Barton, 2011). This is determined by the type of degree and certification the teacher possesses, his or her position, and subjects taught (Courtade et al., 2010; Strain et al., 2011). For instance, a special education teacher who is teaching 7th grade science is regarded as a “highly qualified teacher” if he or she holds a bachelor’s degree, special education teaching certification, as well as a secondary science certification. Studies have indicated a highly qualified teacher predicts student learning (Courtade et al., 2010;; Huefner & Jameson, 2006; Strain et al., 2011).

NCLB and IDEA 2004 were pivotal acts that raised the standards of the quality of education children with disabilities across the nation (Emmons et al., 2009). Strain et al. (2011) agreed that NCLB affected educational standards, student access to general education, and

educator accountability. Bowen et al. (2011) claimed today more students in the special education programs are now receiving their education in general education classes than ever before (Bowen et al., 2011). NCLB reshaped and forced congressional reform to IDEA (Strain et al., 2011). Regulations set by NCLB prompted the Office of Special Education to examine the amending of IDEA to align with NCLB (2011). IDEA 2004 contained amendments that mandated the use of EBIs to execute individual educational plans (IEPs) for children with disabilities (Wilson, 2006). NCLB was an advanced educational opportunities for students with disabilities that went beyond opening the school doors and sought to provide a quality education.

Legal Issues

Lawsuits in special education are the most pursued form of due process over any other category in education (Ryan et al., 2011). Litigation involving students with ASD is increasing and exceeding in cost in comparison to other special education cases (Etscheidt, 2003; McDonough, 1998). Litigation cost reported cumulatively by Texas Education Service Center Regions 1 and 2 in 1999 and 2000 exceeded a half a million dollars (McDonough, 1998). A study showed three main factors of special education litigation: (a) individual goals were not related to an academic evaluation; (b) lack of highly qualified members involved in IEPs; and (c) usage of appropriate educational strategies (Etscheidt, 2003). Districts have to provide proof of compliance when resolving litigation complaints in how they provided appropriate educational strategies that demonstrate educational benefit to the student (Zikerel, 1997).

The rise in litigation cases involving children with ASD is contributed to the rapid increase in the rate of students diagnosed with ASD and limited training exposure to appropriate EBIs (Simpson, 2004). The best safeguard for districts in preventing litigation is complying with federal and state special education law (Yeager et al., 2000). Yeager et al. (2000) advised for

school districts to be aware of the educational issues involved with special education complaints in order to take preventative measures to avoid potential litigation (Yeager et al., 2000). Studies reveal the causes of legal proceedings in special education are largely due to inadequate understanding of IDEA and FAPE by educational entities (Etscheidt, 2003). According to a study reasons parents reported pursuing litigation with districts were: IEP and ARD recommendations not being followed, failure to provided education in the least restrictive environment, inadequate resources, related services, assessment, ESY, and FAPE (McDonough, 1998). In regards to FAPE, parents will often question and/or dispute what is considered as appropriate educational planning (Etscheidt, 2003). Major issues involved in litigation hearings are the lack of peer-reviewed interventions used in a student's IEPs (White & Mason, 2006). Etschiedt (2003) proclaimed knowledge and training of EBIs aid in IEP development. A need exists to identify effective practices for students with ASD, train educational professionals, and integrate these strategies into IEPs (Simpson, 2004).

Special educators must have a clear understanding that they are legally bound to include EBIs in the development of IEPs (White & Mason, 2006). The level of professional training and lack of preparation programs for professionals who educated children with ASD may contribute to a disconnect between EBIs knowledge and usage (Simpson, 2004). EBIs serve as protection against potential lawsuits because it supports what is deemed as appropriate educational strategies used in IEPs. EBIs have empirical evidence that demonstrated education benefits. Monitoring data on an ongoing basis is also imperative in order to evaluate if the select strategies are effective and if adjustments need to be made (White & Mason, 2006). Districts carry the burden of proof in documenting educational benefits of a student's IEP (Etscheidt, 2003). Etscheidt (2003) reported measures that can be taken to minimize litigation include: professional

development training, awareness of EBIs, and the implementation educational strategies that are empirically valid.

Evidence-Based Interventions (EBIs)

The history of research-based practices was proposed by Archie Cochrane, an epidemiologist and progressive researcher, who sought to find medical interventions that were effective and efficient (Chung & Shah, 2009). Cochrane, in the 1970s, was a pioneer in the evolution that shifted medical professionals from using practices based on trial and error practice to interventions that had empirical findings (Chung & Shah, 2009). The creation of the Cochrane collaboration was the initial assimilation to identify medical research based practices that had scientific evidence as being effective treatments that were reviewed with fidelity (Collet-Klingenberg et al., 2011). The Campbell Collaboration, which followed the Cochrane Collaboration, advanced evidence based practices to further impact legislative decisions and other policies (Collet-Klingenberg et al., 2011 et al., 2010). This movement in the medical community prompted other social professionals including the educational community practice interventions that were research based versus trial and error (Bowen et al., 2011; Hutzler, 2011).

Ole Ivar Lovaas was a researcher who shifted the paradigm of the capabilities for students with ASD (Strain et al., 2011). He began his career in the 1960s as a psychologist and devoted his life's work to the field of autism (Smith & Eikeseth, 2010). He proposed and provided empirical evidence that ASD could be treated through the use of interventions (Strain et al., 2011). According to Smith and Eikeseth (2010), Lovaas was captivated by examining what events took place prior to and after a problem behavior occurred. In his initial study he reviewed students who received early intensive 1 on 1 intervention there was a noted 47% increase in students' progression than those who were in the control group (Ryan et al., 2011). Through

student observations he analyzed antecedent to behaviors, response, and outcomes to address target behaviors (Ryan et al., 2011). Then he would utilize reinforcers to manipulate the outcome of student responses (Ryan et al., 2011). Through his experimental studies Lovaas discovered an increase in communication and decrease of maladaptive behaviors (Smith & Eikeseth, 2010). This included extreme self-injurious behaviors, such as students biting off their own finger tips, bashing their head against dangerous objects, and individuals continuously beating their face with extreme force (2010). This research was monumental, prior to this time students diagnosed with ASD were perceived as unable to rehabilitate or function in society (Collet-Klingenberg et al., 2011; Strain et al., 2011). The findings of Lovaas's research gave parents hope for their child's prognosis, revolutionized education, and ignited research on ASD (Collet-Klingenberg et al., 2011). Many of the recommended EBIs investigated in this study originated through the interventions established by the work of Lovaas (Smith & Eikeseth, 2010).

EBIs can be derived from an educational study's findings, in which the research design is experimental or quasi-experimental (Collet-Klingenberg et al., 2011; National Professional Development Center on ASD Spectrum Disorders [NPDC-ASD], 2011). EBIs are interventions that have been tested, duplicated and peer reviewed from credible professional entities (Collet-Klingenberg et al., 2011). Interventions that are deemed evidence based are regarded as best standard practices (Hutzler, 2011). Such strategies describe the steps, support, and reinforcement techniques in which the desired outcomes can be measure effectiveness (Collet-Klingenberg et al., 2011). Leaders of special education programs should continuously assimilate theory with practice by utilizing the recommendations of field experts (Strain et al., 2011). The practice of EBIs with students diagnosed with ASD is the utilization of recommendations from experts

based on empirical findings (Hutzler, 2011). Typical intervention practices and district based guidelines in developing special education program for children with ASD lack empirical evidence (Collet-Klingenberg et al., 2011). Educational leaders who are in charge of inclusive programs for students diagnosed with ASD need to review current EBIs, or have a specialist to consult with in order to facilitate integration of EBIs as standard practice (Collet-Klingenberg et al., 2011).

National Professional Development Center for ASD (NPDCA)

The National Professional Development Center of ASD Spectrum Disorders (NPDC-ASD) has recommended a set of 24 EBIs for children with ASD that have met federal standards of research design criteria (Collet-Klingenberg et al., 2011). The set of EBIs can be categorized in order to have outcomes that assist children with ASD in areas of academics, behavior, communication, play, social skills, and transitions (Collet-Klingenberg et al., 2011). Facilitating support systems for educators will enable information to be accessible in order to build bridges among the entities that have a common purpose and establish standard practices from the content experts (Chrisilp, 2002). NPDC-ASD has responded to this need by developing web-based training that serves as a resource to assist with EBIs practices (Collet-Klingenberg et al., 2011). The 24 EBIs best practices commissioned by the NPDC-ASD (NPDC-ASD, 2011) are:

Behavioral Prompting (antecedent strategies)

Behavioral Reinforcement (consequences)

Task analysis and chaining (step-by-step instructions)

Time delay (waiting longer for a response, reducing prompts)

Computer Aided Instruction

Discrete trial training (one on one instruction)

Naturalistic Training (learning in a natural environment)⁷

Parent-Implemented Interventions (using strategies already used by parent)

Peer-mediated instruction

Picture exchange communication

Pivotal response training (strategy to teach student to interact with learning environment).

Functional Behavior Assessment (understanding possible reasons for behavior)

Environmental Modification (adjusting learning setting to foster learning)

Functional communication Training (strategy to extinguish one behavior and replace with appropriate behavior)

Redirection

Extinction (strategy to eliminate behavior)

Differential reinforcement (strategy to aid student to learn alternative behavior)

Self-management (student monitors/document their own behavior)

Social narratives (stories created for student to address skill/behavior)

Social Skills training groups (teaching social skills curriculum)

Structured work systems (production of visual and interactive directive steps to engage student in academics or life skills).

Video modeling (using video media that allows students to view expected behavior and processes the information first.)

Visual supports (visual aids to support student with activities)

VOCA: Voice Output Communication Aide (electronic communication device)

The degree of applied EBIs used in the classroom can be used to identify areas of professional development topics special educators may need. In developing a foundation in networking professionals can lead to expanding development, potential, and knowledge base for people who are responsible to perform interventions for children with ASD (Noland & Gabriels, 2004). Based on the reporting of these areas, training models and teacher education can be developed (Larsson et al., 2003). Analyzing areas of past training and current application of EBIs are essential in planning professional development for teachers, a critical component of student success (Guskey, 2009). At the same rate, school districts are required to provide appropriate individualized interventions for children with ASD (Collet-Klingenberg et al., 2011).

College of Education

Teacher college preparation programs are critical in the development of the educators' skill to execute strategies that directly address the needs of students (Lee et al., 2011). Currently, there is a shortage of educational professionals who receive specialized training in ASD (Ludlow et al., 2007). Although teachers are now required to implement EBIs, they lack appropriate training in both college pre-service courses and district sponsored professional development (Emmons et al., 2009). There is a need to develop curriculum for teacher preparation training programs to equip teachers with actual strategies for today's classroom (Ludlow, Keramidas, & Landers, 2007). The recent inflation of cases of children with ASD, along with the limited supply of experts has impacted the level of pre-service college preparation (Addison, Lerman, Kuhn, & Vorndra, 2004).

West Virginia University has responded to this demand and has expanded the certification programs it offers to include courses that provide specialized training for future

special education teachers who desire to work with students with ASD (Ludlow et al., 2007). As pioneers in addressing a need for curriculum development and the endorsement of autism certification programming, West Virginia received federal funding that provided tuition reimbursement to certify educators (Ludlow et al., 2007). Courses include legal topics, characteristics of autism, evidence-based interventions, assessment, behavior management, literacy, and mathematics; providing methods, strategies, and skills necessary to plan, implement, and evaluate educational planning for students with ASD (Ludlow et al., 2007). Pre-service preparation and professional development training can enable special education teachers to uphold federal and state legislation (Berry et al., 2011). Busby et al. (2012) claimed teachers who do not receive sufficient pre-service, professional training, and/or experience affects their self-efficacy, which in turn decreases their motivation to perform and comply with their educational obligations. New teachers reported low school support and heavy workloads correlated to their diminished confidence to meet job demands (Lee et al., 2011).

Universities are responsible for training special educators with skills that are applicable to their position (Lee et al., 2011). Pre-service training should expand beyond compliance to the actual teaching of EBIs (Emmons et al., 2009). The low supply of qualified teachers leads districts to choose candidates that may be under qualified for the job, which eventually leads to teacher turnover (Berry et al., 2011). To keep teacher preparation programs aligned with federal mandates colleges of education throughout the nation need to provide upcoming teachers with the tools to handle the evolving dynamics of the educational climate (Emmons et al., 2009; Tincani, 2004).

Professional Development

Educating a student with ASD is viewed as an obscure feat by today's educator (Etscheidt, 2003). Limited training opportunities may obstruct the educator's motivation to take on the challenge of educating a student with ASD (Busby, Ingram, Bowron, Oliver, & Lyons, 2012). A recent study published by the Canadian Center of Science and Education found teachers who reported inadequacies related these feelings to their lack of training and expressed their needs for continued training (Razali, Toran, Sazlina Kamaralzaman, Salleh, Hanafi & Yasin, 2013). A study in Alabama reported the perceptions of teachers regarding students with ASD were (a) inclusion was challenging, (b) planning was time consuming, (c) ASD was complicated, and (d) educational planning was capacious and excessive (Busby et al., 2012). Teachers who are not confident with their ability to execute learning strategies are more likely to display performance deficits (Busby et al., 2012; Lee, Patterson, & Vega, 2011). Professional development can contribute to increase the special educator's perception of their teaching ability and problem solving skills (Lee et al., 2011). Teachers who have a low self-perception of their abilities will typically demonstrate negativity in their attitudes and reactions to complicated situations that call them to be problem-solvers (Lee et al., 2011). In contrast, teachers with higher self-efficacy tend to impact the students they teach with higher education standards as well as vary interventions used that foster learning (Lee et al., 2011).

The National Research Council has identified the lack of teacher training programs and specialized training in ASD as an area in need of improvement (Ludlow et al., 2007). Professional development that is available tends to be infrequently distributed and provides minimal exposure to EBIs (Simpson, 2004). The National Institute of Childhood Disabilities (2005) recommended that districts assess special educators' perception of the importance, levels

of implementation, and previous professional training of EBIs. Hutzler (2011) urged educational leaders to keep current with EBIs that are deemed as best practices. Leaders of special education programs should continuously assimilate theory with practice by utilizing the recommendations of field experts (Guskey, 2009). By examining the current climate encompassing educating students diagnosed with ASD theoretical gaps can be identified based on current practices.

A recent study done at the University of New Mexico sought to identify factors in the gap between research and practice through a literacy skills assessment (Emmons et al., 2009). A literacy training module was developed based on the results of the study (2009). The objective of the training series was to promote skills that enabled teachers to retrieve, evaluate, communicate, and synthesize EBIs literature (2009). Collet-Klingenberg et al. (2011) expressed the need for educators must become skilled at addressing needs of the students, applying EBIs, and monitoring the effectiveness of the chosen EBIs. A special educator's limited exposure and training in ASD impacts the teacher's perception in his or her ability to address the complex educational planning involved (Lee et al., 2011). Educators who are confident in their abilities tend to be more motivated to face challenges and accept responsibility for their role in education (Busby et al., 2010).

There are many challenges educators face in the acquisition of knowledge and application of EBIs in the classroom (Tincani, 2007). Teachers have the task of juggling the daily demands as an educator and allocating supplemental resources for their curriculum (Bowen et al., 2011). Bowen et al. (2011) noted teachers tend to use interventions that suit their style versus data driven practices. Addison et al. (2004) also identified the retrieval of resources for EBIs as major barrier in the execution of EBIs. Bowen et al. (2011) added lack of training, administrative support, and funding as hurdles educators face in executing EBIs in the classroom

(Bowen et al., 2011). Providing training is essential because knowledge of EBIs is not an option for school districts. Per federal law it is mandated they occur (Collet-Klingenberg et al., 2011; Gabriels & Noland, 2004). The application of EBIs for children with ASD is critical to a child's ultimate quality of life (Carnhan et al., 2011).

Educational Climate

The number of cases of children ages 3-17 with ASD increased by 289.5% from 1997 to 2008 (NCDC, 2013). IDEA 2004 mandated special education teachers integrate EBIs with goal set by the students individual education plan (IEP) (Collet-Klingenberg et al., 2011). Students are entering the classrooms with a new set of challenges and it is imperative to establish collaboration among administrators and teachers to increase in levels of expertise (Easton, 2008). Although the use of EBIs has been proven to increase the academic performance of children with ASD, a gap exists in the application of EBIs (Bowen et al., 2011). Teachers must acclimate to the areas of educational reform that governs the educational guidelines for children with disabilities (Tincani, 2007).

There is also a notable amount of teacher turnover rates in special education (Berry et al., 2011). Teacher burnout and lack of mentoring opportunities also attribute to attrition rates (Lee et al., 2011). Statistical results identified special education teacher retention and recruitment as obstacles for school districts (Berry, Petrin, Gravelle & Farmer, 2011). A study indicated approximately 46% of schools in a district reported their inability to locate qualified personnel to teach children with ASD (McDonough, 2008). Additionally, approximately 13.2% of special education teachers leave their position in the first year, 29% by the end of the third year, and 38% by the end of their fifth year (Berry et al., 2011).

The movement now for educational reformation is to equip veteran teachers with adequate training opportunities (Courtade et al., 2010). The recent amendments to IDEA require classroom implementation of EBIs (Bowen et al., 2011). The increase in standards may create a gap between teacher preparation programs and standards that teachers are obligated to adhere. These changes have also called educators to seize the opportunity to become experts in their field (Emmons et al., 2009).

Chapter III

Methodology

Introduction

A reported disconnect exists between EBIs and standard practices of special education teachers (Collet-Klingenberg et al., 2011). There are limited studies that examine or evaluate the knowledge and training of EBIs for educators who work with children with ASD (Casella & Colela, 2004). The purpose of the study was to examine the relationship between EBIs training for special education teachers and their practice of classroom interventions for children with ASD. The EBIs that are included in the study are derived from the recommended 24 EBIs by the National Professional Development Center for ASD Spectrum Disorder (National Board of Professional Development for ASD [NPDC-ASD], 2011). The study was guided by the following research questions:

1. What is the correlation of pre-service training and classroom implementation of EBIs?
2. What is the correlation of professional development and classroom implementation of EBIs?
3. What is the correlation of pre-service training from a traditional four-year college and classroom implementation of EBIs?
4. What is the correlation of pre-service training from an alternative teacher certification program and classroom implementation of EBIs?
5. How do demographics differ in their impact of classroom implementation of EBIs?
6. How do demographics differ in their impact on pre-service training?
7. How do demographics differ in their impact on professional development?

Design

The study employed a quantitative approach. It used statistical analysis for description, correlation, and multivariate analysis of variance (MANOVA). The goal of a descriptive study was to explore and describe the variables of interest (Mertler, 2009). Additionally, descriptive studies unveil the norms of certain populations as well as providing an opportunity for a deeper understanding of the culture (Sagor, 2011). In the study, the researcher sought to obtain data that may give more insight to the extent that special education teachers are trained in EBIs and the use of interventions in the classroom of children with ASD.

The correlational element of the study examined how these variables related to one another (Mertler, 2009). Based on the empirical evidence, the researcher confirmed a relationship does exist, as well as its strength and direction (Mertler, 2009). Due to non-experimental nature of the study, no causal inferences were drawn, however, results may be used to develop theories or predict future behavior (Mertler, 2009). The multivariate analysis of variance (MANOVA) examined the differences among groups where there are several dependent variables simultaneously (Stevens, 2002). MANOVA is used where “the dependent variables considered together make sense as a group” (Stevens, 2002, p. 173). The analysis test shows how scores varied among the groups. This study examined how types of education and demographics differ in their impact of classroom interventions. If there is statistical significance, Tukey HSD test determined the specific category where statistical significance occurs (Coladarci et al., 2011).

Participant Selection

The study was conducted at an urban school district in south Texas. All special education teachers in grades K-12 were invited to participate in the study. An Outside Research application was approved from the participating district to conduct study. Approximately 261 special education teachers from the school district were invited to participate in the study. Fifty-four campuses were invited to participate in the study. Campuses included elementary, middle, and high schools. Participants were invited to the study via e-mail correspondence. Initial recipients of the invitation were the campus principals, as per the guidelines of the Outside Research consent given by the district. Campus principals could choose to participate in the study by forwarding the email to their campus special education teachers. Participants had the ability to click on a link that would connect the participant in the online survey. Recipients of the invitation could choose to participate in the study by clicking on a link that would connect the participant in the online survey. All special education teachers who were invited to participate in the study taught in grades from pre-kindergarten to grade twelve. Forty-four special education teachers from this district participated in the online survey for a response rate of 16%. Creswell (2012) wrote that academic journals indicate a good response rate is around 50%, however the rate fluctuates, depending on notification, follow-up, respondent interest, instrument quality, and incentives. A lower response rate is not indicative of data quality (Creswell, 2012). Results indicated good data distribution so quality of data can be assumed for analyses. The instrument is an Evidence-Based Intervention Questionnaire (EBIQ), which is a teacher self-report survey based on the 24 EBIs recommended by the NPDC-ASD.

Instrumentation

An Evidence-Based Intervention Questionnaire (EBIQ) was developed by the researcher. There are four parts to the EBIQ. Parts 1 – 3 include the 24 EBIs recommended by the National Professional Development Center for ASD Spectrum Disorder (NPDC-ASD, 2011):

Behavioral Prompting (antecedent strategies).

Behavioral Reinforcement (consequences).

Task analysis and chaining (step-by-step instructions).

Time delay (waiting longer for a response, reducing prompts).

Computer Aided Instruction.

Discrete trial training (one on one instruction).

Naturalistic Training (learning in a natural environment).

Parent-Implemented Interventions (using strategies already used by parent).

Peer-mediated instruction.

Picture exchange communication.

Pivotal response training (strategy to teach student to interact with learning environment).

Functional Behavior Assessment (understanding possible reasons for behavior).

Environmental Modification (adjusting learning setting to foster learning).

Functional Communication Training (strategy to extinguish one behavior and replace with appropriate behavior).

Redirection.

Extinction (strategy to eliminate behavior).

Differential reinforcement (strategy to aid student to learn alternative behavior).

Self-management (student monitors/document their own behavior).

Social narratives (stories created for student to address skill/behavior).

Social Skills training groups (teaching social skills curriculum).

Structured work systems (production of visual and interactive directive steps to engage student in academics or life skills).

Video modeling (using video media that allows students to view expected behavior and processes the information first).

Visual supports (visual aids to support student with activities)

Voice Output Communication Aide (VOCA).

In Part 1, the participants were asked to report the level of pre-service training they had received for each EBI. In Part 2, the participants were asked to report the level of professional development training they have received for each EBI. In Part 3, the participants were asked to report the level of implementation of each EBIs in their classrooms. The following scale was used: U = unknown terminology; 1 = none; 2 = rarely—less than 10%; 3 = occasionally—up to 30%; 4 = frequently—up to 50%; 5 = usually—up to 70%; 6 = extensive—up to 90% or more.

The fourth part of the EBIQ was designed to gather data on selected demographic characteristics of the special education teachers to describe the sample. The variables were age, gender, ethnicity, education level, grade level, years of experience as a classroom teacher, years of experience as a special education teacher, and years of experience working with children diagnosed with ASD. A panel of experts was formed to examine the content validity of the EBIQ. The feedback from the panel was used to modify the instrument.

Data Collection

An Outside Research application was submitted to the participating district to conduct the study (see attachment of approval) and to obtain a special education teacher roster with e-mail addresses. A professional criterion for participants was that they are identified as special education teachers of grades PK-12. Fifty-four campuses were invited to participate, which included elementary, middle, and high schools. Initial recipients of the invitation were the campus principals, as per the guidelines of the Outside Research consent given by the district. The initial email was sent to all campus administrators inviting their campus special education teachers to participate in the study, a link to connect to the online study, and attached was the Outside Research approval form from the district for their record. Campus principals could choose to participate in the study by forwarding the email to their campus special education teachers. The participants, who chose to click on the link, were taken to an online survey. Participants were invited to participate in the study via e-mail correspondence. The initial page introduced participants of the nature of the study, objectives, procedural safeguards, and risk/benefits of the study. Participants were given the contact information of the principal investigator and faculty advisor if they have any questions regarding the study. Additionally, they were provided with the contact information of the Research Compliance Office, if they should have any questions about their rights. They were also informed that this study is voluntary and results will remain confidential. Participants authorized their consent online. Those who chose not to participate in this study selected “Do not consent” and did not proceed with the online survey. All participants were 18 years of age or older.

Participants who volunteered completed an online Evidence Based Interventions Questionnaire. A follow-up e-mail reminder was sent to all potential participants two weeks

after the initial e-mail, thanking those who have already completed the survey and encouraging those who have not yet responded.

Safeguards were put in place in order to ensure the data obtained were secure and remained confidential. Individual and district identities will not be revealed in any context of the study. The school district is referred to as a “school district in South Texas” in order to keep its identity secure. Additionally, the survey did not require participants to input personal data or reveal their identity. In addition, documents relating to the study will not contain pseudonyms or number identification in order to protect the confidentiality of the participating bodies. All results were reported in aggregate form. Data were stored in the researcher's computer, which is password protected and only the researcher and faculty advisor will examine the data for analyses for results. The data will be stored for three years then deleted.

Data Analysis

The data were analyzed according to several types of statistical tests with the Statistical Package for the Social Sciences (SPSS). Descriptive statistics were used to summarize and organize the quantitative data. Descriptive statistics of the special education teachers who participated in the survey revealed calculations for the following variables: (a) age; (b) gender; (c) level of education; (d) certification; (e) educational program, (f) education delivery method; (g) years of teaching experience; (h) years of teaching experience with autism (i) educational setting; (j) teaching assignment; and (k) ethnicity. Descriptive statistics summarized the results so information can be relayed in meaningful ways (Coladarci et al., 2011). Frequency distributions are part of descriptive statistics, which provided results according to how data were associated by assigned values (Coladarci et al., 2011).

For research questions one through four a series of Spearman rank-order correlation coefficients (Field, 2009) were used to examine the bivariate associations between the level of pre-service training and professional development in EBIs and classroom application of each intervention. Correlation coefficients were determined to analyze the degree of association and direction.

Research questions five through seven were analyzed by MANOVA. MANOVA tested statistical differences among categories and their impact on the implementation of EBIs, as well as pre-service and professional development training. The Tukey analysis can determine specific categories of significance, if they occur with MANOVA.

The multivariate analysis of variance (MANOVA) statistical analyses examined the differences among demographic categories of each EBI (Coladarci et al., 2011). There are nine categories of demographics. The analyses show how scores vary among groups. If there is statistical significance, Tukey HSD determined the specific category where statistical significance occurs (Coladarci et al., 2011). MANOVA gave overall statistical results by combining dependent variables, but also provided individual results. All analyses were tested with a significance level of $p < .05$.

Assumptions

There were several assumptions associated with statistical analyses. Assumptions related to conditions to be met to help ensure accuracy of results (Glass & Hopkins, 2008). The first assumption related independence of observations where participants do collaborate with each other when completing the survey. The second assumption concerns normality. Histograms, skewness, and kurtosis show the assumption. The expectation is that scores are normally distributed. A third assumption related to homogeneity of variance. It pertains to equality of

scored around a mean score. Levene's statistic tested equality. If the groups are determined unequal, results can be interpreted according to Levene's unequal pairing. By examining descriptive statistics and assumptions for their acceptability, data can be further analyzed with correlations and MANOVAs.

The purpose of the study was to examine the relationship between EBIs training for special education teachers and their practice of classroom interventions for children with autism. In the study the researcher assumed the data gave more insight to the extent that special education teachers are trained in EBIs and the use of interventions in the classroom of children with ASD. The study unveiled the norms of the special education populations at an urban school district in South Texas and providing an opportunity for educational leaders to gain deeper understanding of the culture (Sagor, 2011). The correlational element of the study investigated how variables related to one another (Mertler, 2009).

Chapter four begins with a descriptive account of the participants. The data were collected from 44 special education teachers. Descriptive statistics were used to provide a summary of demographics descriptive results. The chapter continues to address statistical assumptions that describe the condition of the data for further analyses. This is followed by the presentation of results according to each research question.

Chapter IV

Results

The purpose of the study was to examine the relationship between EBIs training for special education teachers and their practice of classroom interventions for children with ASD. Forty-four special educators from an urban district in South Texas participated in this study. This chapter relates the results of data analysis from the seven research questions that guided the study:

1. What is the correlation of pre-service training and classroom implementation of EBIs?
2. What is the correlation of professional development and classroom implementation of EBIs?
3. What is the correlation of pre-service training from a traditional four-year college and classroom implementation of EBIs?
4. What is the correlation of pre-service training from an alternative teacher certification program and classroom implementation of EBIs?
5. How do demographics differ in their impact of classroom implementation of EBIs?
6. How do demographics differ in their impact on pre-service training?
7. How do demographics differ in their impact on professional development?

Descriptive Results

Descriptive statistics were used to summarize and organize the quantitative data. The following tables provide a summary of demographics descriptive results beginning with age. There were two cases in the 22-30 age group but they were too few for analysis so they were recoded to be in the 31-40. There was one case in the 61+ age group but it was too few for analysis so it was recoded to be in the 51+ category. The results are presented in Table 1.

Table 1

Age of Participants, N=44

| Grouping | Frequency | Percent |
|----------|-----------|---------|
| 31-40 | 13 | 29.5 |
| 41-50 | 14 | 31.8 |
| 51+ | 17 | 38.6 |

Data were analyzed on the gender of the participants. The results are presented in Table 2.

Table 2

Gender of Participants, N=44

| Grouping | Frequency | Percent |
|----------|-----------|---------|
| Male | 14 | 31.8 |
| Female | 30 | 68.2 |

Data were analyzed on the level of education of the participants. There were no participants in the doctorate category and it is not included in Table 3. The results are presented in Table 3.

Table 3

Participant Level of Education, N=44

| Grouping | Frequency | Percent |
|-----------|-----------|---------|
| Bachelors | 21 | 47.7 |
| Masters | 23 | 52.3 |

Data were analyzed on method in which the participants' special education teaching certification was obtained. There were two participants that were certified through testing but since there were too few cases, they were recoded into the Alternative Teaching program category. The results are presented in Table 4.

Table 4

Participants Certification, N=44

| Grouping | Frequency | Percent |
|------------------------------|-----------|---------|
| Traditional 4-year program | 21 | 47.7 |
| Alternative Teaching program | 23 | 52.3 |

Data were analyzed on certification programs participants completed. The results are presented in Table 5.

Table 5

Participants Alternatively Certified, N=44

| Grouping | Frequency | Percent |
|-----------------------------|-----------|---------|
| Not Alternatively Certified | 18 | 40.9 |
| College/University | 9 | 20.5 |
| Service Center | 9 | 20.5 |
| Other | 8 | 18.2 |

Data were collected on the participants' certification programs grouping. There were too few cases in the online and hybrid categories so no further analysis was conducted beyond descriptive. The results are presented in Table 6.

Table 6

Participants Education Delivery Method, N=44

| Grouping | Frequency | Percent |
|--------------|-----------|---------|
| Face to Face | 38 | 86.4 |
| Online | 1 | 2.3 |
| Hybrid | 5 | 11.4 |

Data were collected on participant's range of years of teaching experience. The results are presented in Table 7. There was one case in the first year teaching experience category but it was too few for analysis so it was recoded to be in the 0-5 category.

Table 7

Participants Teaching Experience, N=44

| Grouping | Frequency | Percent |
|-------------|-----------|---------|
| 0-5 years | 6 | 13.7 |
| 6-10 years | 17 | 38.6 |
| 11-20 years | 11 | 25.0 |
| 21+ years | 10 | 22.7 |

Data were analyzed on participants' range of years of teaching experience with students diagnosed with an ASD. There was one case in the 21+ teaching experience group but it was too few for analysis, it was recoded to be in the 11-20 category. The results are presented in Table 8.

Table 8

Participants Teaching Experience with students diagnosed with an ASD, N=44

| Grouping | Frequency | Percent |
|-------------|-----------|---------|
| 0-5 years | 26 | 59.0 |
| 6-10 years | 9 | 20.5 |
| 11-20 years | 9 | 20.5 |

Data were collected on participants educational setting in which they teach. The results are presented in Table 9.

Table 9

Participants Education Setting, N=44

| Grouping | Frequency | Percent |
|---------------|-----------|---------|
| Elementary | 17 | 38.6 |
| Middle School | 16 | 36.4 |
| High School | 11 | 25.0 |

Data were gathered on participants teaching assignment. The results are presented in Table 10.

Table 10

Participants Teaching Assignment, N=44

| Grouping | Frequency | Percent |
|----------------------------------|-----------|---------|
| Inclusive/ Co-teaching | 5 | 11.4 |
| Adaptive Education (Life Skills) | 17 | 54.5 |
| Resource | 11 | 20.5 |
| Social Skills Program | 10 | 13.6 |

Data were collected on participants' ethnicity. There were no participants in the Native American, Asian, or Pacific Islanders, that data are not used for further analyses. The results are presented in Table 11.

Table 11

Participants Ethnicity, N=44

| Grouping | Frequency | Percent |
|---------------------|-----------|---------|
| White | 20 | 45.5 |
| Black | 2 | 4.5 |
| Hispanic | 21 | 47.7 |
| Indian Subcontinent | 1 | 2.3 |

Statistical Assumptions

There are several assumptions associated with statistical analyses. The first assumption relates to independence of observations. It is assumed participants did not collaborate with each other when completing the survey, thus completed the survey independent of each other. The second assumption concerns normality. The expectation is that scores are normally distributed. Analyses for skewness, kurtosis, and histograms showed normal distributions. A third assumption relates to homogeneity of variance. It pertains to equality of scores around a mean score, Levene's statistic tests equality. If the groups were determined unequal, results were interpreted according to Levene's unequal pairing. By then examining descriptive statistics and assumptions for their acceptability, data were further analyzed with correlations and MANOVAs. In instances where there is a low N, results should be interpreted with caution.

Research Questions

Research question one looked at the correlation of pre-service training and classroom implementation of EBIs. Research question one examined the correlation between pre-service training and classroom implementation of EBIs from all 44 participants. It examined whether there is a correlation between teachers receiving education in the type of intervention and their implementation of it in the classroom. The results show statistically significant correlations with the exception of computer aided instruction. Although Vogt (2007) argued there are no useful statistical rules for deciding large or small correlations coefficients that range from -1 to +1. Coladarci et al. (2004) related that context is important for judging the strength of association between variables in correlation. In some instances a low correlation may be important given the framework of a study and expected outcomes. However, as a general rule, the following guide is applied to the results of the study: $\pm .8$ to ± 1.0 is very strong relationship; $\pm .6$ to $\pm .8$ strong relationship; $\pm .4$ to $\pm .6$ intermediate relationship; $\pm .2$ to $\pm .4$ weak relationship; $.0$ to $\pm .2$ weak or no relationship (Salkind, 2007). Table 12 provides a summary of the results.

Table 12

Correlation of Pre-service Training and Classroom Implementation of EBIs, N = 44, 6-point scale: 1 = none; 2 = rarely—less than 10%; 3 = occasionally—up to 30%; 4 = frequently—up to 50%; 5 = usually—up to 70%; 6 = extensively—up to 90% or more

| | M | SD | r |
|--|--------------|---------------|-------|
| Behavior prompting Classroom implementation | 3.30 4.50 | 1.75 1.42 | .52** |
| Behavior Reinforcement Classroom implementation | 3.73 4.91 | 1.74 1.14 | .30* |
| Task analysis & chaining Classroom implementation | 2.91 4.14 | 1.78 1.61 | .46** |
| Time delay Classroom implementation | 3.32 4.77 | 1.96 1.29 | .44** |
| Computer aided instruction Classroom implementation | 3.00 4.32 | 1.67 1.29 | .23 |
| Discrete trial training Classroom implementation | 2.91 4.16 | 1.90 1.93 | .53** |
| Naturalistic training Classroom implementation | 2.43 3.25 | 1.74 1.81 | .63** |
| Parent-implemented interventions Classroom implementation | 2.52 3.59 | 1.68 1.151 | .55** |
| Peer-mediated instruction Classroom implementation | 2.95 3.80 | 1.64 1.41 | .56** |
| Picture exchange communication Classroom implementation | 2.95 4.30 | 1.98 1.58 | .42** |

| | | | |
|-----------------------------------|------|------|-------|
| Pivotal response training | 2.18 | 3.16 | .71* |
| Classroom implementation | 3.23 | 4.23 | |
| Functional behavior assessment | 3.16 | 1.74 | .36* |
| Classroom implementation | 4.32 | 1.48 | |
| Environment modification | 3.09 | 1.71 | .50** |
| Classroom implementation | 4.43 | 1.56 | |
| Functional communication training | 3.16 | 1.79 | .45** |
| Classroom implementation | 4.32 | 1.65 | |
| Redirection | 4.07 | 1.76 | .43** |
| Classroom implementation | 5.09 | 1.16 | |
| Extinction | 3.39 | 1.78 | .53** |
| Classroom implementation | 4.30 | 1.50 | |
| Differential Reinforcers | 3.27 | 1.89 | .57** |
| Classroom implementation | 4.36 | 1.60 | |
| Self-management | 2.82 | 1.72 | .63** |
| Classroom implementation | 3.48 | 1.61 | |
| Social narrative | 3.00 | 1.88 | .44** |
| Classroom implementation | 4.20 | 1.85 | |
| Social skills training | 2.86 | 1.83 | .41** |
| Classroom implementation | 4.75 | 1.43 | |
| Structured work systems | 2.73 | 1.72 | .36* |
| Classroom implementation | 4.30 | 1.69 | |
| Video modeling | 2.20 | 1.75 | .66** |
| Classroom implementation | 3.18 | 1.76 | |
| Visual support | 3.02 | 1.66 | .33* |
| Classroom implementation | 4.75 | 1.33 | |
| VOCA | 2.09 | 1.61 | .48** |
| Classroom implementation | 3.16 | 1.99 | |

*Correlation is significant at $p < .05$ (2-tailed)

**Correlation is significant at $F < .01$ (2-tailed)

Research question two looked at the correlation of professional development and classroom implementation of EBIs. Research question two examined the correlation between professional development training and classroom implementation of EBIs from all 44 participants. It examined whether there is a correlation between teachers receiving education in

the type of intervention from professional development and their implementation of it in the classroom. The results show statistically significant correlations with all 24 EBIs. Table 13 provides a summary of the results.

Table 13

Correlation of Professional Development and Classroom Implementation of EBIs, N = 44, 6-point scale: 1 = none; 2 = rarely—less than 10%; 3 = occasionally—up to 30%; 4 = frequently—up to 50%; 5 = usually—up to 70%; 6 = extensively—up to 90% or more

| | M | SD | r |
|-----------------------------------|------|------|-------|
| Behavior prompting | 4.23 | 1.43 | .77** |
| Classroom implementation | 4.50 | 1.42 | |
| Behavior Reinforcement | 4.61 | 0.97 | .58* |
| Classroom implementation | 4.91 | 1.14 | |
| Task analysis & chaining | 3.91 | 1.64 | .81** |
| Classroom implementation | 4.14 | 1.61 | |
| Time delay | 4.45 | 1.49 | .60** |
| Classroom implementation | 4.77 | 1.29 | |
| Computer aided instruction | 4.14 | 1.09 | .68** |
| Classroom implementation | 4.32 | 1.29 | |
| Discrete trial training | 3.61 | 1.85 | .84** |
| Classroom implementation | 4.16 | 1.93 | |
| Naturalistic training | 3.14 | 1.77 | .86** |
| Classroom implementation | 3.25 | 1.81 | |
| Parent-implemented interventions | 3.27 | 1.59 | .70** |
| Classroom implementation | 3.59 | 1.15 | |
| Peer-mediated instruction | 3.73 | 1.35 | .83** |
| Classroom implementation | 3.80 | 1.41 | |
| Picture exchange communication | 4.09 | 1.68 | .75** |
| Classroom implementation | 4.30 | 1.58 | |
| Pivotal response training | 3.00 | 1.98 | .91** |
| Classroom implementation | 3.23 | 2.02 | |
| Functional behavior assessment | 4.11 | 1.45 | .68* |
| Classroom implementation | 4.23 | 1.48 | |
| Environment modification | 4.00 | 1.57 | .86** |
| Classroom implementation | 4.43 | 1.56 | |
| Functional communication training | 4.05 | 1.62 | .72** |
| Classroom implementation | 4.32 | 1.65 | |
| Redirection | 4.59 | 1.28 | .64** |
| Classroom implementation | 5.09 | 1.16 | |
| Extinction | 4.09 | 1.55 | .76** |
| Classroom implementation | 4.30 | 1.50 | |
| Differential Reinforcers | 4.09 | 1.64 | .83** |
| Classroom implementation | 4.36 | 1.60 | |
| Self-management | 3.30 | 1.72 | .82** |
| Classroom implementation | 3.48 | 1.61 | |

| | | | |
|--------------------------|------|------|-------|
| Social narrative | 3.93 | 1.86 | .88** |
| Classroom implementation | 4.20 | 1.85 | |
| Social skills training | 4.25 | 1.54 | .79** |
| Classroom implementation | 4.75 | 1.43 | |
| Structured work systems | 3.98 | 1.79 | .87* |
| Classroom implementation | 4.30 | 1.69 | |
| Video modeling | 3.27 | 1.78 | .81** |
| Classroom implementation | 3.18 | 1.76 | |
| Visual support | 4.50 | 1.47 | .81** |
| Classroom implementation | 4.75 | 1.33 | |
| VOCA | 3.34 | 1.92 | .89** |
| Classroom implementation | 3.16 | 1.99 | |

*Correlation is significant at $p < .05$ (2-tailed)

**Correlation is significant at $p < .01$ (2-tailed)

Research question three looked at the correlation of pre-service training from a traditional four-year college and classroom implementation of EBIs. It examined whether there is a correlation between teachers receiving education in the type of intervention from a 4-year certification program and their implementation of it in the classroom. The results show statistically significant correlations with the following EBIs: (a) behavioral prompting; (b) naturalistic training; (c) parent implemented interventions; (d) peer-mediated instruction; (e) pivotal response training; (f) environmental modification; (g) differential reinforcers; (h) self-management; and (i) visual modeling. Table 14 provides a summary of the results.

Table 14

Correlation of Pre-service Training from a Traditional 4-year Program and Classroom Implementation of EBIs, N = 18, 6-point scale: 1 = none; 2 = rarely—less than 10%; 3 = occasionally—up to 30%; 4 = frequently—up to 50%; 5 = usually—up to 70%; 6 = extensively—up to 90% or more

| | M | SD | r |
|-----------------------------------|------|------|-------|
| Behavior prompting | 3.67 | 1.82 | .49* |
| Classroom implementation | 4.72 | 1.07 | |
| Behavior Reinforcement | 4.00 | 1.78 | .40 |
| Classroom implementation | 5.06 | 1.16 | |
| Task analysis & chaining | 3.39 | 1.58 | .08 |
| Classroom implementation | 4.44 | 1.29 | |
| Time delay | 3.33 | 1.91 | .25 |
| Classroom implementation | 4.94 | 1.16 | |
| Computer aided instruction | 3.00 | 1.57 | .26 |
| Classroom implementation | 4.39 | 1.29 | |
| Discrete trial training | 3.11 | 1.84 | .41 |
| Classroom implementation | 4.17 | 1.82 | |
| Naturalistic training | 2.50 | 1.54 | .71** |
| Classroom implementation | 3.11 | 1.57 | |
| Parent-implemented interventions | 2.56 | 1.61 | .65** |
| Classroom implementation | 3.44 | 1.42 | |
| Peer-mediated instruction | 3.39 | 1.54 | .54* |
| Classroom implementation | 3.89 | 1.41 | |
| Picture exchange communication | 3.11 | 1.97 | .25 |
| Classroom implementation | 4.67 | 1.53 | |
| Pivotal response training | 1.72 | 1.87 | .77** |
| Classroom implementation | 2.78 | 2.13 | |
| Functional behavior assessment | 3.50 | 1.58 | .09 |
| Classroom implementation | 4.28 | 1.45 | |
| Environment modification | 3.44 | 1.38 | .64** |
| Classroom implementation | 4.50 | 1.34 | |
| Functional communication training | 3.33 | 1.33 | .37 |
| Classroom implementation | 4.28 | 1.36 | |
| Redirection | 4.50 | 1.30 | .21 |
| Classroom implementation | 5.28 | .96 | |
| Extinction | 3.83 | 1.43 | .29 |
| Classroom implementation | 4.50 | 1.34 | |
| Differential Reinforcers | 3.56 | 1.62 | .67** |
| Classroom implementation | 4.39 | 1.42 | |
| Self-management | 2.94 | 1.55 | .48* |
| Classroom implementation | 3.50 | 1.47 | |
| Social narrative | 3.00 | 1.72 | .15 |
| Classroom implementation | 4.56 | 1.42 | |
| Social skills training | 2.83 | 1.51 | .17 |
| Classroom implementation | 4.94 | 1.11 | |

| | | | |
|--------------------------|------|------|------|
| Structured work systems | 2.78 | 1.44 | .30 |
| Classroom implementation | 4.44 | 1.47 | |
| Video modeling | 2.17 | 1.47 | .58* |
| Classroom implementation | 2.94 | 1.47 | |
| Visual support | 3.33 | 1.61 | .45 |
| Classroom implementation | 4.89 | 1.37 | |
| VOCA | 2.17 | 1.69 | .29 |
| Classroom implementation | 2.72 | 1.87 | |

*Correlation is significant at $p < .05$ (2-tailed)
**Correlation is significant at $p < .01$ (2-tailed)

Research question four examined the correlation between pre-service training from an alternative teacher certification program and classroom implementation of EBIs. It examined whether there is a correlation between teachers receiving education in the type of intervention from an alternative certification program and their implementation of it in the classroom. The results show statistically significant correlations with the exception of behavioral prompting, behavior reinforcement, time delay, and picture exchange communication. Table 15 provides a summary of the results.

Table 15

Correlation of Pre-service Training from an Alternative Certification Program and Classroom Implementation of EBIs, N = 9, 6-point scale: 1 = none; 2 = rarely—less than 10%; 3 = occasionally—up to 30%; 4 = frequently—up to 50%; 5 = usually—up to 70%; 6 = extensively—up to 90% or more

| | M | SD | r |
|--------------------------|------|------|-----|
| Behavior prompting | 3.33 | 1.32 | .63 |
| Classroom implementation | 3.78 | 1.64 | |
| Behavior Reinforcement | 4.00 | 1.12 | .47 |
| Classroom implementation | 4.44 | 1.42 | |

| | | | |
|-----------------------------------|------|------|-------|
| Task analysis & chaining | 3.11 | 1.45 | .87** |
| Classroom implementation | 4.00 | 1.87 | |
| Time delay | 3.33 | 2.24 | .63 |
| Classroom implementation | 4.22 | 1.99 | |
| Computer aided instruction | 3.11 | 1.62 | .68** |
| Classroom implementation | 4.11 | 1.83 | |
| Discrete trial training | 3.00 | 1.87 | .80** |
| Classroom implementation | 3.89 | 2.42 | |
| Naturalistic training | 2.67 | 1.50 | .74* |
| Classroom implementation | 3.11 | 1.83 | |
| Parent-implemented interventions | 2.78 | 2.05 | .87** |
| Classroom implementation | 3.22 | 1.86 | |
| Peer-mediated instruction | 2.89 | 1.76 | .82** |
| Classroom implementation | 3.44 | 1.59 | |
| Picture exchange communication | 3.00 | 1.50 | .28 |
| Classroom implementation | 3.78 | 1.48 | |
| Pivotal response training | 2.56 | 1.88 | .72** |
| Classroom implementation | 2.78 | 1.86 | |
| Functional behavior assessment | 3.44 | 1.88 | .97** |
| Classroom implementation | 3.78 | 1.72 | |
| Environment modification | 3.56 | 1.67 | .86** |
| Classroom implementation | 4.11 | 1.76 | |
| Functional communication training | 4.05 | 1.62 | .72** |
| Classroom implementation | 4.32 | 1.65 | |
| Redirection | 4.59 | 1.28 | .64** |
| Classroom implementation | 5.09 | 1.16 | |
| Extinction | 4.09 | 1.55 | .76** |
| Classroom implementation | 4.30 | 1.50 | |
| Differential Reinforcers | 4.09 | 1.64 | .83** |
| Classroom implementation | 4.36 | 1.60 | |
| Self-management | 3.30 | 1.72 | .82** |
| Classroom implementation | 3.48 | 1.61 | |
| Social narrative | 3.93 | 1.86 | .88** |
| Classroom implementation | 4.20 | 1.85 | |
| Social skills training | 4.25 | 1.54 | .79** |
| Classroom implementation | 4.75 | 1.43 | |
| Structured work systems | 3.98 | 1.79 | .87* |
| Classroom implementation | 4.30 | 1.69 | |

| | | | |
|--------------------------|------|------|-------|
| Video modeling | 3.27 | 1.78 | .81** |
| Classroom implementation | 3.18 | 1.76 | |
| Visual support | 4.50 | 1.47 | .81** |
| Classroom implementation | 4.75 | 1.33 | |
| VOCA | 3.34 | 1.92 | .89** |
| Classroom implementation | 3.16 | 1.99 | |

*Correlation is significant at $p < .05$ (2-tailed)

**Correlation is significant at $p < .01$ (2-tailed)

Research question five looked at how demographics differ in their impact of classroom implementation of EBIs.

Age

The first analysis for research question five was age: (a) 31-40 years; (b) 41-50 years; and 51+years. Data were analyzed according to the age grouping of the participants. There were two cases in the 22-30 age group but they were too few for analysis so they were recoded to be in the 31-40 years. There was one case in the 61+ age group but it was too few for analysis so it was recoded to be in the 51+ years category. Overall, there was no statistically significant difference between ages and their impact of classroom implementation of EBIs, $F(2, 44) = 1.40$, $p = .15$. However, because MANOVA gives overall statistical results by combining dependent variables, it also gives individual results. Between-subjects effects indicate the differences in the following areas: pivotal response classroom implementation and video modeling classroom implementation. Tukey HSD results show where differences in ages occur. With pivotal response classroom implementation ($F(2, 30) = 4.73$, $p < .05$), the difference is between 31-40 years old ($M = 4.08$; $N = 13$) and 51-60 years old ($M = 2.18$, $N = 17$). With video modeling classroom implementation ($F(2, 31) = 4.06$, $p < .05$), the difference is between 41-50 school ($M = 3.79$, $N = 14$) and 51-60 ($M = 2.18$, $N = 17$). Tables 16 and 17 summarize the results.

Table 16

Individual Differences Participants' Age and Classroom Implementation of EBIs, N = 30

| Dependent variable | N | M | SD | F | p |
|---------------------------|----|------|------|------|-------|
| Pivotal Response Training | | | | 4.73 | < .05 |
| 31-40 years | 13 | 4.08 | 1.66 | | |
| 51-60 years | 17 | 2.18 | 2.13 | | |

Table 17

Individual Differences Participants' Age and Classroom Implementation of EBIs, N = 31

| Dependent variable | N | M | SD | F | p |
|--------------------|----|------|------|------|-------|
| Video Modeling | | | | 4.06 | < .05 |
| 41-50 years | 14 | 3.79 | 1.85 | | |
| 51-60 years | 17 | 2.18 | 1.53 | | |

Gender

Overall, there is no statistically significant difference between gender and their impact of classroom implementation of EBIs, $F(1, 44) = .78, p = .73$. However, because MANOVA gives overall statistical results by combining dependent variables, it also gives individual results.

Tukey HSD results show where differences in ages occur: Time delay classroom implementation: $F(1, 44) = 4.12, p < .05$, the difference occurs in females scoring higher ($M = 5.03, N = 30$) than males ($M = 4.21, N = 14$). Self-management classroom implementation: $F(1, 44) = 5.07, p < .05$, the difference occurs in females scoring higher ($M = 3.83, N = 30$) than males ($M = 2.71, N = 14$). Social narratives classroom implementation: $F(1, 44) = 5.61, p < .05$, the difference occurs in females scoring higher ($M = 4.63, N = 30$) than males ($M = 3.29, N = 14$). Video modeling classroom implementation: $F(1, 44) = 7.12, p < .05$, the difference occurs in females scoring higher ($M = 3.63, N = 30$) than males ($M = 2.21, N = 14$). Visual Support: $F(1, 44) = 7.50, p < .05$, the difference occurs in females scoring higher ($M = 5.10, N = 30$) than males ($M = 4.00, N = 14$). Table 18 summarizes the results.

Table 18

Individual Differences Participants' Gender and Classroom Implementation of EBIs, N = 44

| Dependent variable | N | M | SD | F | p |
|--|----|------|------|------|-------|
| Time Delay classroom implementation (CI) | | | | 4.12 | < .05 |
| Female | 30 | 5.03 | 1.13 | | |
| Male | 14 | 4.21 | 1.48 | | |
| Self management CI | | | | 5.07 | |
| Female | 30 | 3.83 | 1.51 | | |
| Male | 14 | 2.71 | 1.59 | | |
| Social narrative CI | | | | 5.61 | |
| Female | 30 | 4.63 | 1.63 | | |
| Male | 14 | 3.29 | 2.02 | | < .05 |
| Video modeling CI | | | | 7.15 | |
| Female | 30 | 3.63 | 1.61 | | |
| Male | 14 | 2.21 | 1.78 | | < .05 |
| Visual Support CI | | | | 7.50 | |
| Female | 30 | 5.10 | 1.66 | | |
| Male | 14 | 4.00 | 2.13 | | |

Educational Level

The third analysis was with education level: bachelors and masters. Data were analyzed according to MANOVA. It used scores from multiple dependent variables (EBIs best practices) and created a single variable. Additionally, it provided individual dependent variable comparisons. With regard to differences between participants whose education level is either a bachelor's or master's degree, there was no overall statistically significant difference: $F(1, 44) = .48, p = .96$. MANOVA also analyzed individual dependent variables; however,

Certification

The fourth analysis was alternative certification programs: (a) not alternatively certified; (b) college/university program; (c) service center; and (d) other category. There were no statistical difference between types of certification in their impact of classroom implementation of EBIs, $F(3, 44) = .81, p = .79$. MANOVA also analyzes individual dependent variables; however there were no individual statistically significant relationships.

Educational Program

The fifth analysis was the process in which participants were certified: (a) traditional 4-year program; (b) alternative teaching program; and (c) certification by exam. There were too few cases in the exam category. It was recoded and moved from those who got a certificate by exam ($N = 4$) into the alternative category so the N went from 19 to 23 due to the alternative of the exam. There was no statistically significant difference between types of certification in their impact of classroom implementation of EBIs, $F(1, 44) = 1.22, p = .33$. MANOVA also analyzes individual dependent variables; however there were no individual statistically significant relationships.

Educational Delivery Method

The sixth analysis was the delivery method: (a) face-to-face; (b) online; and (c) hybrid. There were too few cases in the categories to run the statistics.

Years of Teaching Experience

The seventh analysis was with years of teaching in four categories: (a) 1-5; (b) 6-10 ; (c) 11-20; and (d) 21+. Overall, there was no statistically significant difference: $F(3, 44) = 1.33, p = .14$. However, because MANOVA gives overall statistical results by combining dependent variables, it also gives individual results. Individually, there is a statistically significant

difference in years of teaching experience in video modeling classroom implementation.

Between-subjects effects indicate that statistical significance in video modeling classroom implementation is between the 6-10 and 11-20 years teaching groups: $F(3, 29) = 3.91, p < .05$.

Tukey HSD post hoc indicates it is with 6-10 years experience group having a higher mean score on classroom implementation ($M = 3.88, N = 17$) than the 11-20 years teaching experience group ($M = 2.17, N = 12$). Table 19 summarizes the results.

Table 19

Individual Differences among Years of Teaching Experience and Classroom Implementation of EBIs, $N = 29$

| Dependent variable | N | M | SD | F | p |
|----------------------|----|------|------|------|-------|
| Video Modeling | | | | 3.91 | < .05 |
| 6-10 years teaching | 17 | 3.88 | 1.62 | | |
| 11-20 years teaching | 12 | 2.17 | 1.53 | | |

Years of Teaching Experience with Autism

The eighth analysis for research question five was with years of teaching children with autism in three categories: (a) 1-5 years; (b) 6-10 years; (c) 11-20 years; and (d) 21+ years. Data were analyzed according to MANOVA. There is a statistically significant difference between years of teaching children with autism in their impact of classroom implementation of EBIs, $F(2, 44) = 1.93, p < .05$. Between-subjects effects indicate the differences in the following areas: computer-aided instruction classroom implementation; naturalistic training classroom implementation; peer-mediated instruction classroom implementation; environmental modification classroom implementation; functional communication training classroom implementation; and structured work system implementation.

Tukey HSD post hoc indicates years of teaching children with autism occur. With

computer-aided instruction classroom implementation ($F(2, 35) = 8.61, p < .01$), the difference is between 1-5 years ($M = 3.77, N = 26$) and 6-10 years ($M = 5.44, N = 9$). With naturalistic training classroom implementation ($F(2, 35) = 5.72, p < .01$), the difference is between 1-5 years ($M = 2.65, N = 26$) and 6-10 years ($M = 4.78, N = 9$). With peer-mediated instruction classroom implementation ($F(2, 35) = 5.28, p < .01$), the difference is between 1-5 years ($M = 3.38, N = 26$) and 6-10 years ($M = 5.00, N = 9$). With environmental modification classroom implementation ($F(2, 35) = 3.26, p < .05$), the difference is between 1-5 years ($M = 4.12, N = 26$) and 6-10 years ($M = 5.56, N = 9$). With functional communication training classroom implementation ($F(2, 35) = 3.34, p < .05$), the difference is between 1-5 years ($M = 3.88, N = 26$) and 6-10 years ($M = 5.44, N = 9$). With structured work systems classroom implementation ($F(2, 44) = 8.78, p < .01$), the differences are between 1-5 years ($M = 3.54, N = 26$), 6-10 years ($M = 5.56, N = 9$), 11-20 years ($M = 5.22, N = 9$). Tables 20 and 21 summarize the results.

Table 20

Individual Differences among Years of Teaching Experience Students with ASD and Classroom Implementation of EBIs, N = 35

| Dependent variable | N | M | SD | F | <i>p</i> |
|-----------------------------------|----|------|------|------|----------|
| Computer-aided instruction | | | | 8.61 | < .01 |
| 1-5 years teaching | 26 | 3.77 | 1.24 | | |
| 6-10 years teaching | 9 | 5.44 | .73 | | |
| Naturalistic training | | | | 5.72 | < .01 |
| 1-5 years teaching | 26 | 2.65 | 1.88 | | |
| 6-10 years teaching | 9 | 4.78 | 1.09 | | |
| Peer-mediated instruction | | | | 5.28 | < .01 |
| 1-5 years teaching | 26 | 3.38 | 1.47 | | |
| 6-10 years teaching | 9 | 5.00 | .87 | | |
| Environmental modification | | | | 3.26 | < .05 |
| 1-5 years teaching | 26 | 4.12 | 1.66 | | |
| 6-10 years teaching | 9 | 5.56 | .53 | | |
| Functional communication training | | | | 3.34 | < .05 |
| 1-5 years teaching | 26 | 3.88 | 1.84 | | |
| 6-10 years teaching | 9 | 5.44 | .88 | | |

Table 21

Individual Differences among Years of Teaching Experience Students with ASD and Classroom Implementation of EBIs, N = 44

Level of Students Educated

The ninth analysis for research question five was the current level of students educated by

| Dependent variable | N | M | SD | F | <i>p</i> |
|---------------------------|----|------|------|------|----------|
| Structured worked systems | | | | 8.78 | < .01 |
| 1-5 years of teaching | 26 | 3.54 | 1.75 | | |
| 6-10 years teaching | 9 | 5.56 | .73 | | |
| 11-20 years teaching | 9 | 5.22 | .83 | | |

participants: (a) elementary; (b) middle school; and (c) high school. Data were analyzed according to MANOVA. Overall, there was no statistically significant difference between current levels of students educated and their impact of classroom implementation of EBIs, $F(1, 44) = .89, p = .65$. However, because MANOVA gives overall statistical results by combining dependent variables, it also provides individual results. There was a statistical difference between current levels of students educated and impact classroom implementation of EBIs. Between-subjects effects indicated the differences in the following areas: peer-mediated classroom implementation; self management classroom implementation; and video modeling classroom implementation. Tukey HSD results show differences among the current level of students educated. With peer-mediated classroom implementation ($F(2, 27) = 3.46, p < .05$), the difference is between middle school ($M = 4.25, N = 16$) and high school ($M = 2.91, N = 11$). With self management classroom implementation ($F(2, 44) = 3.46, p < .01$), the differences are between elementary school ($M = 4.00, N = 17$), middle school ($M = 3.81, N = 16$) and high school ($M = 2.18, N = 11$). With video modeling classroom implementation ($F(2, 27) = 3.95, p < .05$), the difference is between middle school ($M = 3.75, N = 16$) and high school ($M = 2.00, N = 11$). Tables 22 and 23 summarize the results.

Table 22

Individual Differences among Current Level of Students Participants Educate and Classroom Implementation of EBIs, N = 27

| Dependent variable | N | M | SD | F | p |
|---------------------------|----|------|------|------|-------|
| Peer-mediated instruction | | | | 3.46 | < .05 |
| middle school | 16 | 4.25 | 1.34 | | |
| high school | 11 | 2.91 | 1.04 | | |
| Video modeling | | | | 3.95 | < .05 |
| middle school | 16 | 3.75 | 1.65 | | |
| high school | 11 | 2.00 | 1.79 | | |

Table 23

Individual Differences among Current Level of Students Participants Educate and Classroom Implementation of EBIs, N = 44

| Dependent variable | N | M | SD | F | p |
|--------------------|----|------|------|------|-------|
| Self-management | | | | 3.46 | < .01 |
| elementary | 17 | 4.00 | 1.58 | | |
| middle school | 16 | 3.81 | 1.38 | | |
| high school | 11 | 2.18 | 1.33 | | |

Educational Setting

The tenth analysis for research question five was the current setting of the participants' teaching assignment: (a) inclusive= 5; (b) adaptive = 24; (c) resource = 9; and (d) PALS = 6.

There were too few cases in the categories to run the statistics in this category.

Ethnicity

Because there were too few cases in categories other than White and Hispanic, only White and Hispanic were used for analysis. Overall, there is no statistically significant difference between ages and their impact of classroom implementation of EBIs, $F(1, 41) = 1.75$, $p = .12$.

Research question six looked at how demographics differ in their impact on pre-service training.

Age

The first analysis was with age: (a) 31-40; (b) 41-50; and (c) 51-60. Data were analyzed according to MANOVA. It used scores from multiple dependent variables (EBIs best practices) and creates a single variable. Additionally, it provided individual dependent variable comparisons. With regard to differences between participants age categories, there was no overall statistically significant difference: $F(2, 44) = 1.16, p = .32$. MANOVA also analyzes individual dependent variables; however there were no individual statistically significant relationships.

Gender

The second analysis was with gender: (a) male; and (b) female. Data were analyzed according to MANOVA. It used scores from multiple dependent variables (EBIs best practices) and creates a single variable. Additionally, it provided individual dependent variable comparisons. With regard to differences between participants age categories, there was no overall statistically significant difference: $F(1, 44) = 1.17, p = .37$. MANOVA also analyzes individual dependent variables; however there were no individual statistically significant relationships.

Level of Education

The third analysis was with education level: bachelors and masters. Data were analyzed according to MANOVA. It used scores from multiple dependent variables (EBIs best practices) and creates a single variable. Additionally, it provided individual dependent variable comparisons. With regard to differences between participants whose education level is either a

bachelor's or master's degree, there were no overall statistically significant difference: $F(1, 44) = .66, p = .83$. MANOVA also analyzes individual dependent variables; however there were no individual statistically significant relationships.

Certification

The fourth analysis was with type of certification: (a) traditional 4-year; and (b) alternative. Data were analyzed according to MANOVA. It used scores from multiple dependent variables (EBIs best practices) and creates a single variable. Additionally, it provided individual dependent variable comparisons. With regard to differences between participants' type of certification, there were no overall statistically significant difference: $F(2, 44) = 1.33, p = .26$. MANOVA also analyzes individual dependent variables; however there were no individual statistically significant relationships.

Educational Program

The fifth analysis was with educational program: (a) not alternatively; (b) college or university; (c) service center; (d) other. Data were analyzed according to MANOVA. It used scores from multiple dependent variables (EBIs best practices) and creates a single variable. Additionally, it provided individual dependent variable comparisons. With regard to differences between participants' alternative certification, there were no overall statistically significant difference: $F(3, 44) = .89, p = .69$. MANOVA also analyzes individual dependent variables. MANOVA also analyzes individual dependent variables; however there were no individual statistically significant relationships.

Delivery Method

The sixth analysis was educational delivery method: (a) face-to face, N= 38; (b) online, N=1; and (c) hybrid, N=5. There were few cases in the categories to run the statistical analysis.

Years of Teaching Experience

The seventh analysis was with years of teaching experience: (a) 1-5 years; (b) 6-10 years; (c) 11-20 years; and (d) 21+ years. Data were analyzed according to MANOVA. It used scores from multiple dependent variables (EBIs best practices) and creates a single variable.

Additionally, it provided individual dependent variable comparisons. With regard to differences between participants with number of years teaching, there were no overall statistically significant difference: $F(3, 44) = .75, p = .88$. MANOVA also analyzes individual dependent variables; however there were no individual statistically significant relationships.

Years of Teaching Experience Children with Autism

The eighth analysis was with years of teaching children with autism: (a) 1-5; (b) 6-10; (c) 11-20; and (d) 21+. Data were analyzed according to MANOVA. It used scores from multiple dependent variables (EBIs best practices) and creates a single variable. Additionally, it provided individual dependent variable comparisons. With regard to differences between participants with number of years teaching children with autism, there were no overall statistically significant difference: $F(2, 44) = .60, p = .95$. MANOVA also analyzes individual dependent variables; however there were no individual statistically significant relationships.

Educational Setting

The ninth analysis was with current level of students: (a) elementary; (b) middle school; and (c) high school. Data were analyzed according to MANOVA. It used scores from multiple dependent variables (EBIs best practices) and creates a single variable. Additionally, it provided

individual dependent variable comparisons. With regard to differences between participants' current level of students they educate, there was a statistically significant difference: $F(2, 44) = 1.84, p < .05$. MANOVA also analyzes individual dependent variables; however there were no individual statistically significant relationships. Individual scores show where the descriptive differences occur. Table 24 summarizes the results.

Table 24

Individual Differences Educational setting and Impact on Pre-service Training, N = 44, 6-point scale: 1 = none; 2 = rarely—less than 10%; 3 = occasionally—up to 30%; 4 = frequently—up to 50%; 5 = usually—up to 70%; 6 = extensively—up to 90% or more

| Dependent variable | N | M | SD |
|----------------------------------|----|------|------|
| Behavioral prompting | | | |
| Elementary | 17 | 3.18 | 1.55 |
| Middle | 16 | 3.13 | 1.96 |
| High | 11 | 3.73 | 1.79 |
| Behavioral reinforcement | | | |
| Elementary | 17 | 3.65 | 1.46 |
| Middle | 16 | 3.62 | 2.09 |
| High | 11 | 4.00 | 1.73 |
| Task analysis & chaining | | | |
| Elementary | 17 | 2.35 | 1.54 |
| Middle | 16 | 3.38 | 1.59 |
| High | 11 | 3.09 | 2.26 |
| Time delay | | | |
| Elementary | 17 | 3.35 | 1.87 |
| Middle | 16 | 3.38 | 1.98 |
| High | 11 | 3.09 | 2.25 |
| Computer aided instruction | | | |
| Elementary | 17 | 2.71 | 1.49 |
| Middle | 16 | 3.13 | 1.78 |
| High | 11 | 3.27 | 1.85 |
| Discrete trial training | | | |
| Elementary | 17 | 3.18 | 1.81 |
| Middle | 16 | 2.31 | 1.85 |
| High | 11 | 3.36 | 2.06 |
| Naturalistic training | | | |
| Elementary | 17 | 2.76 | 1.72 |
| Middle | 16 | 2.06 | 1.65 |
| High | 11 | 2.45 | 1.97 |
| Parent-implemented interventions | | | |
| Elementary | 17 | 2.24 | 1.44 |
| Middle | 16 | 2.63 | 1.75 |
| High | 11 | 2.82 | 1.99 |
| Peer-mediated instruction | | | |
| Elementary | 17 | 2.94 | 1.20 |
| Middle | 16 | 3.50 | 2.07 |
| High | 11 | 2.18 | 1.17 |

| | | | |
|-----------------------------------|----|------|------|
| Picture exchange communication | | | |
| Elementary | 17 | 3.00 | 1.84 |
| Middle | 16 | 3.00 | 2.03 |
| High | 11 | 2.82 | 2.18 |
| Pivotal response training | | | |
| Elementary | 17 | 1.88 | 1.97 |
| Middle | 16 | 2.31 | 1.89 |
| High | 11 | 2.45 | 2.34 |
| Functional behavior assessment | | | |
| Elementary | 17 | 2.94 | 1.48 |
| Middle | 16 | 3.13 | 1.82 |
| High | 11 | 3.55 | 2.07 |
| Environment modification | | | |
| Elementary | 17 | 3.41 | 1.42 |
| Middle | 16 | 3.00 | 1.83 |
| High | 11 | 2.73 | 2.01 |
| Functional communication training | | | |
| Elementary | 17 | 3.18 | 1.59 |
| Middle | 16 | 3.38 | 1.89 |
| High | 11 | 2.82 | 2.04 |
| Redirection | | | |
| Elementary | 17 | 4.53 | 1.55 |
| Middle | 16 | 3.62 | 1.93 |
| High | 11 | 4.00 | 1.79 |
| Extinction | | | |
| Elementary | 17 | 3.35 | 1.54 |
| Middle | 16 | 3.62 | 1.89 |
| High | 11 | 3.09 | 2.07 |
| Differential Reinforcers | | | |
| Elementary | 17 | 3.24 | 1.86 |
| Middle | 16 | 3.56 | 1.90 |
| High | 11 | 2.91 | 2.02 |
| Self-management | | | |
| Elementary | 17 | 2.76 | 1.35 |
| Middle | 16 | 3.31 | 1.99 |
| High | 11 | 2.18 | 1.72 |
| Social narrative | | | |
| Elementary | 17 | 3.18 | 1.70 |
| Middle | 16 | 3.25 | 1.98 |
| High | 11 | 2.36 | 2.01 |

| | | | |
|-------------------------|----|------|------|
| Social skills training | | | |
| Elementary | 17 | 2.88 | 1.62 |
| Middle | 16 | 3.06 | 2.02 |
| High | 11 | 2.55 | 1.97 |
| Structured work systems | | | |
| Elementary | 17 | 3.18 | 1.74 |
| Middle | 16 | 2.88 | 1.78 |
| High | 11 | 1.82 | 1.33 |
| Video modeling | | | |
| Elementary | 17 | 1.94 | 1.60 |
| Middle | 16 | 3.00 | 1.79 |
| High | 11 | 1.45 | 1.57 |
| Visual supports | | | |
| Elementary | 17 | 3.29 | 1.53 |
| Middle | 16 | 3.06 | 1.69 |
| High | 11 | 2.55 | 1.86 |
| VOCA | | | |
| Elementary | 17 | 2.35 | 1.62 |
| Middle | 16 | 2.19 | 1.80 |
| High | 11 | 1.55 | 1.29 |

Teaching Assignment

The eighth analysis was teaching assignment: (a) inclusive = 5; (b) adaptive = 24; (c) resource = 9; and (d) PALS = 6. There were too few cases in the categories to run the statistical analysis.

Ethnicity

The tenth analysis was with race/ethnicity: (a) white; and (b) Hispanic. Data were analyzed according to MANOVA. It used scores from multiple dependent variables (EBIs best practices) and creates a single variable. Additionally, it provides individual dependent variable comparisons. With regard to differences between participants race/ethnicity categories, there was statistical difference: $F(1, 41) = 2.53, p < .05$. MANOVA also analyzes individual dependent variables. MANOVA also analyzes individual dependent variables; however there

were no individual statistically significant relationships. Individual scores show where the descriptive differences occur. Table 25 summarizes the results.

Table 25

Individual Differences Ethnicity and Impact on Pre-service Training, N = 41, 6-point scale: 1 = none; 2 = rarely—less than 10%; 3 = occasionally—up to 30%; 4 = frequently—up to 50%; 5 = usually—up to 70%; 6 = extensively—up to 90% or more.

| Dependent variable | N | M | SD |
|----------------------------------|----|------|------|
| Behavioral prompting | | | |
| White | 20 | 3.15 | 2.06 |
| Hispanic | 21 | 3.29 | 1.59 |
| Behavioral reinforcement | | | |
| White | 20 | 3.40 | 1.88 |
| Hispanic | 21 | 3.95 | 1.69 |
| Task analysis & chaining | | | |
| White | 20 | 2.95 | 1.99 |
| Hispanic | 21 | 2.86 | 1.62 |
| Time delay | | | |
| White | 20 | 3.50 | 2.12 |
| Hispanic | 21 | 3.33 | 1.85 |
| Computer aided instruction | | | |
| White | 20 | 2.70 | 1.56 |
| Hispanic | 21 | 3.14 | 1.82 |
| Discrete trial training | | | |
| White | 20 | 3.40 | 1.56 |
| Hispanic | 21 | 2.52 | 1.82 |
| Naturalistic training | | | |
| White | 20 | 2.45 | 1.73 |
| Hispanic | 21 | 2.24 | 1.73 |
| Parent-implemented interventions | | | |
| White | 20 | 2.55 | 1.76 |
| Hispanic | 21 | 2.43 | 1.72 |
| Peer-mediated instruction | | | |
| White | 20 | 2.80 | 1.36 |
| Hispanic | 21 | 2.81 | 1.81 |
| Picture exchange communication | | | |
| White | 20 | 2.50 | 1.36 |
| Hispanic | 21 | 3.14 | 1.81 |

| | | | |
|-----------------------------------|----|------|------|
| Pivotal response training | | | |
| White | 20 | 1.70 | 1.94 |
| Hispanic | 21 | 2.38 | 1.96 |
| Functional behavior assessment | | | |
| White | 20 | 3.20 | 1.70 |
| Hispanic | 21 | 2.95 | 1.80 |
| Environment modification | | | |
| White | 20 | 3.40 | 1.67 |
| Hispanic | 21 | 2.71 | 1.79 |
| Functional communication training | | | |
| White | 20 | 3.25 | 1.68 |
| Hispanic | 21 | 2.90 | 1.92 |
| Redirection | | | |
| White | 20 | 4.35 | 1.66 |
| Hispanic | 21 | 3.71 | 1.88 |
| Extinction | | | |
| White | 20 | 3.50 | 1.61 |
| Hispanic | 21 | 3.10 | 1.95 |
| Differential Reinforcers | | | |
| White | 20 | 3.55 | 1.73 |
| Hispanic | 21 | 2.81 | 1.99 |
| Self-management | | | |
| White | 20 | 2.70 | 1.38 |
| Hispanic | 21 | 2.67 | 1.93 |
| Social narrative | | | |
| White | 20 | 2.85 | 1.73 |
| Hispanic | 21 | 2.90 | 2.02 |
| Social skills training | | | |
| White | 20 | 2.60 | 1.67 |
| Hispanic | 21 | 2.95 | 1.99 |
| Structured work systems | | | |
| White | 20 | 2.65 | 1.60 |
| Hispanic | 21 | 2.67 | 1.83 |
| Video modeling | | | |
| White | 20 | 1.85 | 1.39 |
| Hispanic | 21 | 2.19 | 1.86 |
| Visual supports | | | |
| White | 20 | 2.90 | 1.74 |
| Hispanic | 21 | 2.95 | 1.60 |

| | | | |
|----------|----|------|------|
| VOCA | | | |
| White | 20 | 1.95 | 1.50 |
| Hispanic | 21 | 1.86 | 1.49 |

Research question seven looked at how demographics differ in their impact on professional development.

Age

The first analysis was age categories: (a) 31-40; (b) 41-50; and (c) 51-60. Data were analyzed according to MANOVA. It used scores from multiple dependent variables (EBIs best practices) and creates a single variable. Additionally, it provided individual dependent variable comparisons. With regard to differences between participants age categories, there were no overall statistically significant differences: $F(2, 44) = .78, p = .79$. MANOVA also analyzes individual dependent variables. There was a statistically significant difference between 31-40 age group and 51-60 age group with pivotal response training: $F(1, 30) = 4.73, p < .05$. The 31-40 age group had a higher mean score ($M = 3.85, N = 13, SD = 1.52$) than the 51-60 age group ($M = 1.94, N = 17, SD = 1.95$). Table 26 summarizes the results.

Table 26

Individual Differences among Age and Professional Development with EBIs

| Dependent variable | N | M | SD | F | p |
|---------------------------|----|------|------|------|-------|
| Pivotal Response Training | | | | 4.73 | < .05 |
| 31-40 age group | 13 | 3.85 | 1.23 | | |
| 51-60 age group | 17 | 1.94 | 1.95 | | |

Gender

The second analysis was with gender: (a) male; and (b) female. Data were analyzed according to MANOVA. It used scores from multiple dependent variables (EBIs best practices) and creates a single variable. Additionally, it provided individual dependent variable comparisons. With regard to differences between participants age categories, there were no overall statistically significant difference: $F(1, 44) = .74, p = .76$. MANOVA also analyzes individual dependent variables. There were individual statistically significant relationships in the following areas: (a) Peer-Mediation; (b) Self-Management Training; (c) Social Narrative; (d) Social Skills Training; (e) Structured Work Systems (f) Video Modeling; and (g) Visual Support. Individual scores show where the differences occur. In Peer-mediation professional development of EBIs gender differs statistically significant: $F(1, 44) = 4.11, p < .05$. Females scored higher ($M = 4.00, N = 30$) than males ($M = 3.14, N = 14$). In Self-Management Training professional development of EBIs gender differs statistically significant: $F(1, 44) = 5.80, p < .05$. Females scored higher ($M = 3.70, N = 30$) than males ($M = 2.43, N = 14$). In Social Narrative professional development of EBIs gender differs statistically significant: $F(1, 44) = 6.78, p < .05$. Females scored higher ($M = 4.40, N = 30$) than males ($M = 2.93, N = 14$). In Social Skills training professional development of EBIs gender differs statistically significant: $F(1, 44) = 6.58, p < .05$. Females scored higher ($M = 4.63, N = 30$) than males ($M = 3.43, N = 14$).). In Structured Work Systems professional development of EBIs gender differs statistically significant: $F(1, 44) = 5.89, p < .05$. Females scored higher ($M = 4.40, N = 30$) than males ($M = 3.07, N = 14$).). In Video Modeling professional development of EBIs gender differs statistically significant: $F(1, 44) = 6.05, p < .05$. Females scored higher ($M = 3.70, N = 30$) than males ($M = 2.36, N = 14$).). In Visual Support professional development of EBIs gender differs

statistically significant: $F(1, 44) = 6.63, p < .05$. Females scored higher ($M = 4.87, N = 30$) than males ($M = 3.71, N = 14$). Table 27 summarizes the results.

Table 27

Individual Differences among Gender and Professional Development with EBIs

| Dependent variable | N | M | SD | F | <i>p</i> |
|--------------------------|----|------|------|------|----------|
| Peer-Mediation | | | | 4.11 | < .05 |
| Male | 14 | 3.14 | 1.23 | | |
| Female | 30 | 4.00 | 1.34 | | |
| Self-Management Training | | | | 5.80 | < .05 |
| Male | 14 | 2.43 | 1.74 | | |
| Female | 30 | 3.70 | 1.58 | | |
| Social Narrative | | | | 6.78 | < .05 |
| Male | 14 | 2.93 | 1.36 | | |
| Female | 30 | 4.40 | 4.65 | | |
| Social Skills Training | | | | 6.58 | < .05 |
| Male | 14 | 3.43 | 1.56 | | |
| Female | 30 | 4.63 | 1.40 | | |
| Structured Work Systems | | | | 5.89 | < .05 |
| Male | 14 | 3.07 | 1.73 | | |
| Female | 30 | 4.40 | 1.63 | | |
| Video Modeling | | | | 6.05 | < .05 |
| Male | 14 | 2.36 | 1.91 | | |
| Female | 30 | 3.70 | 1.58 | | |
| Visual Support | | | | 6.63 | < .05 |
| Male | 14 | 3.71 | 1.59 | | |
| Female | 30 | 4.87 | 1.28 | | |

Level of Education

The third analysis was with education level: bachelors and masters. Data were analyzed according to MANOVA. It used scores from multiple dependent variables (EBIs best practices) and creates a single variable. Additionally, it provided individual dependent variable comparisons. With regard to differences between participants whose education level is either a bachelor's or master's degree, there were no overall statistically significant difference: $F(1, 44) = 1.88, p = .36$. MANOVA also analyzes individual dependent variables; however, there were no individual statistically significant relationships.

Certification

The fourth analysis was type of certification: (a) traditional 4-year; and (b) alternative. Data were analyzed according to MANOVA. It used scores from multiple dependent variables (EBIs best practices) and creates a single variable. Additionally, it provided individual dependent variable comparisons. With regard to differences between participants' type of certification, there were no overall statistically significant difference: $F(2, 44) = .61, p = .87$. MANOVA also analyzes individual dependent variables. There was a statistically significant difference between traditional 4-year and alternative certification with Differential Reinforcers: $F(1, 44) = 4.35, p < .05$. Alternative certification had a higher mean score ($M = 4.57, N = 23, SD = 1.38$) than traditional 4-year program ($M = 3.57, N = 21, SD = 1.78$). Table 28 summarizes the results.

Table 28

Individual Differences among Type of Certification and Professional Development with EBIs, N=44

| Dependent variable | N | M | SD | F | P |
|----------------------------|----|------|------|------|-------|
| Differential Reinforcers | | | | 4.35 | < .05 |
| Alternative program | 23 | 4.57 | 1.38 | | |
| Traditional 4-year program | 21 | 3.57 | 1.78 | | |

Educational Program

The fifth analysis was with educational program: (a) not alternatively; (b) college or university; (c) service center; (d) other. Data were analyzed according to MANOVA. It used scores from multiple dependent variables (EBIs best practices) and creates a single variable. Additionally, it provides individual dependent variable comparisons. With regard to differences between participants' alternative certification, there were no overall statistically significant difference: $F(3, 44) = 1.10, p = .36$. MANOVA also analyzes individual dependent variables. There were individual statistically significant relationships in the following areas: (a) Functional Behavioral Assessment; (b) Redirection; and (c) Differential Reinforcement. Individual scores show where the differences occur. In Functional Behavioral Analysis professional development of EBIs according to certification is between service center and college/university: $F(3, 18) = 3.30, p < .05$. Tukey HSD post hoc indicates it is with service center having a higher mean score on classroom implementation ($M = 4.67, N = 9$) than college/university ($M = 2.89, N = 9$). In Redirection professional development of EBIs according to certification is between other and college/university: $F(3, 17) = 3.02, p < .05$. Tukey HSD post hoc indicates other ($M = 5.13, N = 8$) has a higher score on than college/university ($M = 3.56, N = 9$). In Differential Reinforcement professional development of EBIs according to certification is between college/university the following: not alternative, service center, and other: $F(3, 44) = 4.32, p < .05$.

.05. Tukey HSD post hoc indicates other (M = 4.75, N = 8) with the highest score followed by service center (M = 4.67, N = 9), not alternatively (M = 4.28, N = 18), then by college/university (M = 2.56, N = 9). Table 29 summarizes the results.

Table 29

Individual Differences among Alternative Certification and Professional Development with EBIs

| Dependent variable | N | M | SD | F | p |
|----------------------------------|----|------|------|------|-------|
| Functional Behavioral Assessment | | | | 3.30 | < .05 |
| Service Center | 9 | 4.67 | 1.12 | | |
| College/university | 9 | 2.89 | 1.62 | | |
| Redirection | | | | 5.13 | < .05 |
| Other | 8 | 5.13 | .84 | | |
| College/university | 9 | 3.56 | 1.81 | | |
| Differential Reinforcement | | | | 4.32 | < .05 |
| Not alternative | 18 | 4.28 | 1.36 | | |
| College/university | 9 | 2.56 | 1.94 | | |
| Service center | 9 | 4.67 | .87 | | |
| Other | 8 | 4.75 | 1.67 | | |

Education Delivery Method

The sixth analysis was the participants' educational delivery which included: (a) Face to Face; (b) Online; (c) Hybrid; (d) Service Center; and (e) Other. There were too few cases to perform statistical analysis in this category.

Years of Teaching Experience

The seventh analysis was with years of teaching experience: (a) 1-5 years; (b) 6-10years; (c) 11-20 years; and (d) 21+ years. Data were analyzed according to MANOVA. It used scores from multiple dependent variables (EBIs best practices) and creates a single variable.

Additionally, it provided individual dependent variable comparisons. With regard to differences between participants with number of years teaching, there were no overall statistically significant difference: $F(3, 44) = .63, p = .97$. MANOVA also analyzes individual dependent variables; however there were no individual statistically significant relationships.

Years Teaching Children with Autism

The third analysis was with years of teaching children with autism: (a) 1-5; (b) 6-10; (c) 11-20; and (d) 21+. Data were analyzed according to MANOVA. It used scores from multiple dependent variables (EBIS best practices) and creates a single variable. Additionally, it provided individual dependent variable comparisons. With regard to differences between participants with number of years teaching children with autism, there were no overall statistically significant difference: $F(2, 44) = .94, p = .59$. MANOVA also analyzes individual dependent variables. Individually, there are statistically significant differences. Between-subjects effects indicate statistical significance in the following areas: (a) Naturalistic Training; (b) Picture Exchange; (c) Structured Work Systems; and (d) Visual Support. In Naturalistic Training Classroom implementation is between the 6-10 and 11-20 years teaching groups: $F(2, 35) = 4.94, p < .05$. Tukey HSD post hoc indicates it is with 1-5 years experience group having a lower mean score on classroom implementation ($M = 2.50, N = 26$) than the 11-20 years teaching experience in the Structured Work Systems group ($M = 3.89, N = 9$). In Picture Exchange classroom implementation is between the 1-5 and 11-20 years teaching groups: $F(2, 35) = 4.59, p < .05$. Tukey HSD post hoc indicates it is with 1-5 years experience group having a lower mean score on classroom implementation ($M = 3.50, N = 26$) than the 11-20 years teaching experience group ($M = 5.00, N = 9$). In Structured Work Systems classroom implementation is between the following groups: 1-5 and 6-10; and 1-5 and 11-20, ($F(2, 35) = 6.21, p < .01$). Tukey HSD post

hoc indicates it is with 1-5 years experience group having a lower mean score on classroom implementation ($M = 3.27$, $N = 26$) than the 6-10 years teaching experience group ($M = 5.00$, $N = 9$); and 1-5 years experience group having a lower mean score on classroom implementation ($M = 3.27$, $N = 26$) than the 11-20 years teaching experience group ($M = 5.00$, $N = 9$). The mean score for both 6-10 and 11-20 age groups are the same, as well as the N . In Visual Support classroom implementation is between the 1-5 and 11-20 years teaching groups: $F(2, 35) = 3.51$, $p < .05$. Tukey HSD post hoc indicates it is with 1-5 years experience group having a lower mean score on classroom implementation ($M = 4.04$, $N = 26$) than the 11-20 years teaching experience group ($M = 5.22$, $N = 9$). Table 30 summarizes the results.

Table 30

Individual Differences among Years of Teaching Experience Students with ASD and Professional Development with EBIs

| Dependent variable | N | M | SD | F | p |
|-------------------------|----|------|------|------|-------|
| Naturalistic Training | | | | 4.94 | < .05 |
| 1-5 years teaching | 26 | 2.50 | 1.70 | | |
| 11-20 years teaching | 9 | 3.89 | 1.62 | | |
| Picture Exchange | | | | 4.59 | < .05 |
| 1-5 years teaching | 26 | 3.50 | 1.79 | | |
| 11-20 years teaching | 9 | 5.00 | 1.12 | | |
| Structured Work Systems | | | | 6.21 | < .01 |
| 1-5 years teaching | 26 | 3.27 | 1.71 | | |
| 6-10 years teaching | 9 | 5.00 | 1.66 | | |
| 11-20 years teaching | 9 | 5.00 | 1.12 | | |
| Visual Support | | | | 3.26 | < .05 |
| 1-5 years teaching | 26 | 4.04 | 1.46 | | |
| 11-20 years teaching | 9 | 5.22 | .97 | | |

Educational Setting

The eighth analysis was with current educational setting in which they teach: (a) elementary; (b) middle school; and (c) high school. Data were analyzed according to MANOVA. It used scores from multiple dependent variables (EBIS best practices) and creates a single variable. Additionally, it provided individual dependent variable comparisons. With regard to differences between participants' current level of students they educate, there was a statistically significant difference: $F(2, 44) = 1.84, p < .05$. MANOVA also analyzes individual dependent variables. There were individual statistically significant relationships in the following areas: (a) Peer-Mediation; (b) Self-Management Training; and (c) Video Modeling. Individual scores show where the differences occur. In PM classroom implementation is between the

elementary and high; and middle and high: $F(2, 44) = 6.96, p < .01$. Tukey HSD post hoc indicates it is with middle school having a higher mean score on classroom implementation ($M = 4.38, N = 17$) followed by elementary school ($M = 3.82, N = 16$) then high school ($M = 2.64, N = 11$). In Self-management classroom implementation is between elementary and high; and middle and high: $F(2, 44) = 5.27, p < .01$. Tukey HSD post hoc indicates middle school teachers have a higher score on classroom implementation from professional development ($M = 3.94, N = 16$) followed by elementary school ($M = 3.53, N = 17$) and then high school ($M = 2.00, N = 11$). In Video Modeling classroom implementation is middle school and high school teachers: $F(2, 38) = 5.26, p < .01$. Tukey HSD post hoc indicates middle school teachers have a higher mean ($M = 4.06, N = 17$) than high school ($M = 2.00, N = 11$). Table 31 summarizes the results.

Table 31

Individual Differences among Education Setting and Professional Development with EBIs, N = 44

| Dependent variable | N | M | SD | F | <i>p</i> |
|--------------------------|----|------|------|------|----------|
| Peer-Mediation | | | | 6.96 | < .01 |
| Elementary | 16 | 3.82 | 1.43 | | |
| Middle | 17 | 4.38 | 1.03 | | |
| High | 11 | 2.64 | 1.73 | | |
| Self-Management Training | | | | 5.27 | < .01 |
| Elementary | 16 | 3.53 | 1.88 | | |
| Middle | 17 | 3.94 | 1.29 | | |
| High | 11 | 2.00 | 1.41 | | |
| Video Modeling | | | | 6.21 | < .01 |
| Middle | 17 | 4.06 | 1.48 | | |
| High | 11 | 2.00 | 1.84 | | |

Teaching Assignment

The ninth analysis was current teaching assignment: (a) Inclusion/Co-Teaching; (b) Adaptive Education (Life Skills); (c) Resource; and (d) Social Skills program. There were too few cases to perform statistical analysis.

Race/Ethnicity

The tenth analysis was with race/ethnicity: (a) white; and (b) Hispanic. Data were analyzed according to MANOVA. It used scores from multiple dependent variables (EBIS best practices) and creates a single variable. Additionally, it provided individual dependent variable comparisons. With regard to differences between participants race/ethnicity categories, there were no statistically significant difference: $F(1, 41) = 1.10, p = .43$. MANOVA also analyzes individual dependent variables. MANOVA also analyzes individual dependent variables; however there were no individual statistically significant relationships.

Summary

The purpose of the study was to examine the relationship between EBIs training for special education teachers and their practice of classroom interventions for children with ASD. An urban school district in South Texas was selected for the study 44 special education teachers from this district participated in the study. Descriptive statistics were used to summarize and organize the data. Frequency distributions provided results according to how data were associated by assigned values. Descriptive statistics of the 44 special education teachers who participated in the survey revealed calculations for the following variables: (a) age; (b) gender; (c) level of education; (d) certification; (e) educational program; (f) education delivery method; (g) years of teaching experience; (h) years of teaching experience with autism; (i) educational setting; (j) teaching assignment; and (k) ethnicity. The study found there were few to no statistical differences among the demographics.

The correlational element of the study was descriptive in nature as it describes the relationship between special educator training and classroom implementation of EBIS. This study investigated the descriptive, correlational, and differences between training and classroom implementation. In the study the researcher assumed the data would give more insight to the relationship between special education teachers trained in EBIs and the use of interventions in the classroom of children with ASD.

Chapter V

Conclusions, Implications, and Recommendations

Chapter five contains an overview of the study. A summary of the population, problem and purpose of the study will be reviewed. This chapter will revisit the study's research

questions to describe the findings presented in Chapter four and how it connects to the literature on special educator training and classroom implantation of EBIs. Implications and recommendations for future research studies will also be discussed later in the chapter.

Teachers can receive special education training two ways. One way is through a traditional college education. A second way is through alternative certification. The study, then, examined the use of EBIs by both groups to understand further how training might affect the use of EBIs. The purpose of the study was to examine the relationship between EBIs training for special education teachers and their practice of classroom interventions for children with ASD.

The study is guided by the following questions:

1. What is the correlation of pre-service training and classroom implementation of EBIs?
2. What is the correlation of professional development and classroom implementation of EBIs?
3. What is the correlation of pre-service training from a traditional four-year college and classroom implementation of EBIs?
4. What is the correlation of pre-service training from an alternative teacher certification program and classroom implementation of EBIs?
5. How do demographics differ in their impact of classroom implementation of EBIs?
6. How do demographics differ in their impact on pre-service training?
7. How do demographics differ in their impact on professional development?

Introduction

Federal compliance demands urgency for educational leaders to evaluate the training and the application of EBIs used by special education teachers (Collet-Klingenberg et al., 2010).

Knowledge and resources are tools that will bridge the gap between educational research and

daily practice (Emmons et al., 2009). Children with ASD are a growing population and it is imperative school districts comply with both federal and state mandates to avoid legal conflicts with parents, and other penalties from government agency due to non-compliance (Tincani, 2007). Due to the rising number of cases of children with ASD measuring the interventions used by professionals that work with children on the ASD is critical (Batista et al., 2010).

The World Health Organization referred to Autism Spectrum Disorder (ASD) as “the fastest growing neurobiological condition in the world” (2007, p. 9). ASD is the leading diagnosis for children with more cases than childhood cancer, diabetes, and pediatric AIDS all together (Batista, Christodulu, Crawley, DeLuke, Frye, & Llaneza, 2010). The dynamics of the No Child Left Behind Act of 2001 and the amendments to the Individuals with Disabilities Education Act 2004 prompted a progressive demand in educating students diagnosed with autism (Bowen et al., 2011), calling to a higher level of standards of accountability special educators (Tincani, 2007). Public policies, such as NCLB and the IDEA support EBIs in mandating public schools to implement EBIs in both educational planning and classroom implementation for students with ASD (DOE, 2011).

An urban school district in South Texas was selected for the study. The total student population is 38,608 in which approximately 3,839 students are enrolled in the special education program with services coordinated by 261 special educators (Texas Education Agency [TEA], 2013). Fifty-four campuses were invited to participate in the study. The campus included elementary, middle, and high school units. Campus principals were notified via e-mail of the purpose and procedures of the study. Recipients of the e-mail, who chose to participate, forwarded the information to special education teachers on their campus. A total of 44 special educators participated in the online survey. The study examined the relationship between pre-

service training, professional development, and classroom application of EBIs. Previous studies suggested gaps between research and practice can be contributed to the lack of teacher training during their pre-service and professional development training (Tincani, 2007). Although there were a low number of participants, the data showed they were representative. This does not mean that the results can be generalized to a larger sample size or population, but it provided insights into trends and patterns regarding training and implementation of EBIs. Thus, results are to be interpreted with caution.

Conclusions

The study used three types of analyses: (a) descriptive; (b) correlation; and (c) multivariate analysis of variance (MANOVA). The goal of description is to explore and describe the variables of interest (Mertler, 2009). Additionally, descriptive data unveil the norms of certain populations as well as provide an opportunity for a deeper understanding of the culture (Sagor, 2011). The correlational element of the study looked at how these variables relate to one another (Mertler, 2009). The multivariate analysis of variance (MANOVA) statistical analyses examined the differences among categories of each EBIS (Coladarci et al., 2011).

Research question one examined the correlation of pre-service training and classroom implementation of EBIs. It examined whether there is a correlation between teachers receiving education in the type of intervention and their implementation of it in the classroom. The results show statistically significant correlations with the exception of computer aided instruction. The relationships were intermediate in strength for the most part with scores ranging from $r = .33$ to $r = .66$. In other words, as pre-service training increases so does classroom implementation of EBIs. The exception was a strong relationship in the area of pivotal response training and classroom implementation, $r = .71$. Pivotal response training refers to an EBIs that contains

procedural steps to identify target behaviors in areas of motivation, response, self-management, and self-initiation (Vismara & Bogin, 2009).

Research question two examined the correlation between professional development training and classroom implementation of EBIs from all 44 participants. It examined whether there is a correlation between teachers receiving education in the type of intervention from professional development and their implementation of it in the classroom. The results show statistically significant correlations. The relationship between professional development training and classroom implementation of the 24 EBIs are determined to have a strong relationship. The results showed strong to very strong relationships between professional development and classroom implementation of EBIs in most categories with scores ranging from $r = .64$ to $r = .91$: behavior prompting; task analysis and chaining; computer aided instruction; discrete trial training; naturalistic training; parent-implemented interventions; peer-mediated instruction; picture exchange communication; pivotal response training; environment modification; functional communication training; redirection; extinction; differential reinforcers; self-management; social narrative; social skills training; structured work systems; video modeling; visual support; and voice output communication aide (VOCA).

Research question three examined the correlation between pre-service training from a 4-year certification program and classroom implementation of EBIs. It examined whether there is a correlation between teachers receiving education in the type of intervention from a 4-year certification program and their implementation of it in the classroom. The results show statistically significant correlations with the following EBIs: (a) behavioral prompting; (b) naturalistic training; (c) parent implemented interventions; (d) peer-mediated instruction; (e) pivotal response training; (f) environmental modification; (g) differential reinforcers; (h) self-

management; and (i) visual modeling. The remaining EBIs were found to have a direct relationship between pre-service trainings from participants from a 4 year traditional certification program and the classroom implementation of EBIs. The correlations are predominately intermediate with scores ranging from $r = .49$ to $r = .67$. However, there are two strong relationships: (a) naturalistic training at $r = .71$; and (b) pivotal response training at $r = .77$.

In contrast, research question four examined the correlation between pre-service training from an alternative teacher certification program and classroom implementation of EBIs. The results show statistically significant correlations with the exception of: (a) behavioral prompting; (b) behavior reinforcement; (c) time delay; and (d) picture exchange communication. The remaining EBIs were found to have a positive relationship between pre-service trainings from participants from an alternative teacher certification program and the classroom implementation of EBIs. The relationships were strong to very strong with scores ranging from $r = .72$ to $r = .97$.

The correlation analyses begin to show trends. The information teachers receive about the implementation of EBIs tend to be stronger from areas other than a college or university. This is not to say that colleges and universities do not provide the information, as the data suggests that they do, but that greater emphasis is placed on the information from other areas of training.

Since teachers come from different backgrounds and have different experiences, the research also examined if differences in background and experience influenced the implementation of EBIs. Research question five examined how demographics differ in their impact of classroom implementation of EBIs. Overall, there were no statistically significant differences between ages, gender, education level, certification programs, teacher preparation

program, certification type, educational setting and their impact of classroom implementation of EBI.

Between-subjects effects indicate the differences among age categories in the following areas: pivotal response classroom implementation and video modeling classroom implementation. Implementation of pivotal response differed between the 31-40 years age category implementing this EBI up to 50% in the classroom, while the 51-60 years olds implemented less than 10% of the time. Additionally, those in the 51-60 years category implemented video modeling less than 10% of the time, whereas the 41-50 years age category implemented up to 45%.

Although there was no general statistically significant relationship between gender and EBIs, there were individual ones. Differences among gender categories, with females scoring higher, occurred in the following areas: (a) self-management; (b) social narratives; (c) video modeling; and (d) visual supports. In each of the categories, females scored higher than males. Females tended to implement EBIs in the previous categories range from 40% to 70% of the time, whereas males implemented them 30% to 40% of the time. Females reported implementing self-management interventions up to 45% of the time while male reported implementing less than 20% of the time. Another difference occurs in females implementing social narratives up to 45% of time in the classroom and males reported implementing up to 35% of the time. Females reported implementing video modeling in the classroom up to 40% of the time, whereas males implemented less than 15% of the time. Lastly, females also indicated a higher frequency implementation of visual supports (up to 70%) while reported males a lower frequency (less than 50%).

There were no individual statistically significant relationships between types of certification in their impact of classroom implementation of EBIs.

There were too few cases in the categories to run the statistical analysis for teacher's educational delivery method: (a) face-to-face; (b) online; and (c) hybrid

There were no general statistically significant relationships between years of teaching experience and EBIs; however, individually there was a statistically significant difference in years of teaching experience in video modeling classroom implementation: 6-10 and 11-20 years teaching groups. Teachers with 6-10 years of experience group implemented video modeling up to 45% of the time, whereas, those with 11-20 years teaching experience group implemented this EBI less than 10%.

One result that stood out is number of years of teaching experience applied to teaching children with ASD. It was overall statistically significant. In EBIs that were computer-aided instruction; naturalistic training; peer-mediated instruction; environmental modification; and functional communication, those teachers with 6-10 years of teaching experience showed a greater percentage of implementing EBIs than those with less than 6 years of experience teaching students with ASD. Teachers with 6-10 years of experience used the EBIs listed above between 50% to just over 70% of the time whereas those with less than 6 years of experience ranged from 20% to 50% of the time. This indicates that not only teaching experience counts, but that teaching experience with ASD is crucial. This is even more pronounced when looking at the EBIs for structured work systems. The 1-5 years category reported the lowest with implementation at 40%. The next was the 11-20 year group at slightly over 70%. The highest was the 6-10 years of experience category, which was above 80%.

Individually, there was a statistical difference between participants' educational setting and classroom implementation with the following EBIs: (a) peer-mediation between middle school and high school settings; (b) self-management among elementary school, middle school and high school; and (c) video modeling classroom between middle school and high school ($M = 2.00$, $N = 11$). Although educational setting was significant, the implementation tended to be low, with middle school teachers implementing the EBIs from approximately 30% to 40% and high school from approximately 10% to 20%.

There is a statistically significant difference between years of teaching children with autism. These differences exist in the following areas: computer-aided instruction classroom implementation; naturalistic training classroom implementation; peer-mediated instruction classroom implementation; environmental modification classroom implementation; functional communication training classroom implementation; and structured work system implementation. Participants with 6-10 years experience reported a higher level of classroom implementation of the EBIs listed above than those with 11-20 years teaching experience. Still, the percentages of implementation are fairly moderate to low with 6-10 years of experience teaching children with autism implementing the above EBIs up to 50% of the time while those with 11-20 years of experience tended to implement the EBIs less than 10%.

Because there were too few cases in categories other than White and Hispanic, only White and Hispanic were used for analysis. Overall, there is no statistically significant difference between ethnicity and their impact of classroom implementation of EBIs.

Research question six examined how demographics differ in their pre-service training of EBIs. Data were analyzed according to MANOVA. There were no statistical differences among (a) age; (b) gender; (c) level of education; (d) certification; (e) educational program; (f) years of

teaching experience; and (g) years of teaching experience with autism; (h) educational setting; (j) ethnicity. With regard to differences between participants race/ethnicity categories, there was statistical difference: $F(1, 41) = 2.53, p < .05$. There were individual differences among the educational setting and ethnicity categories.

Individually, there was a statistical difference between participants' educational setting (elementary, middle, and high school) and pre-service training. They were found with the following EBIs: behavioral prompting; behavioral reinforcement; task analysis and chaining; time delay; computer aided instruction; discrete trial training; naturalistic training; peer-mediated instruction; picture exchange communication; pivotal response training; functional behavioral assessment; environment modification; functional communication training; redirection; extinction, differential reinforcers; self-management; social narrative; social skills training, structured work systems; and video modeling; visual supports; and voice output communication aide (VOCA).

Special education teachers who had an elementary and middle school educational placement reported implementing approximately 30% of pre-service training for behavioral prompting, whereas high school educators reported 45%. Elementary and middle school educators reported implementing up to 40% in behavioral prompting, while high school educators reported more frequent implementation (50%). For task analysis and chaining elementary teachers reported implementing up to 15% based on pre-service training in this EBI whereas middle school teachers described implemented up to 35%; and high school educators up to 30%. Implementation based on pre-service training for computer aided instruction was 20% for teachers in an elementary setting, 30% for middle school, and up to 35% for high school. Implementation of discrete trial training based on pre-service training was 30% for elementary

educators, 15% for middle school, and up to 35% for high school. Naturalistic training implementation based on pre-service training was 35% for elementary and high school educators, but less than 10% for middle school. Implementation of parent-implemented interventions based on pre-service training was up to 30% for elementary educators while middle (less than 10%) and high (less than 15%) school educators reported significantly lower amounts of implementation based on pre-service training. Furthermore, elementary teachers indicated implementing peer-mediation based on pre-service training up to 25%, whereas middle school teachers was up to 40%, and high school teachers reported less than 10% based on pre-service training. Picture exchange was up to 30% for elementary and middle school educators; and up to 25% for high school educators. Elementary (15%) and high school (10%) educators reported significantly lower amounts of implementation based on pre-service training, whereas middle school teachers were up to 40%. Pre-service training for functional behavioral assessment attributed up to 25% implementation for elementary educators, 30% for middle school, and 20% for high school. Environmental modification implementation based on pre-service training for participants in the elementary setting was up to 35%, approximately 30% for middle school, and less than 20% high school. Additionally, those who taught in an elementary setting reported up to 30% of functional communication based on pre-service training, middle school was slightly higher at 35%, while high school was the least at 25%. Redirection was the most implemented EBIs based on pre-service training. Teachers reported implementing redirection up to 60% in the elementary setting, 40% middle school participants, and up to 50% for those who taught in high school. Elementary educators reported implementing differential reinforcement up to 30% based on pre-service training, while those in the middle school setting indicated up to 40%; and high school less than 25%. Self-management techniques were implemented up to 25% based on

pre-service training for elementary educators, 35% for those in the middle school setting, and less than 10% for high school educators. Implementation for social stories based on pre-service training was reported to be up to 25% for elementary educators, 30% for middle school and 20% for high school. Structured work systems implementation based on pre-service training was the highest participants in an elementary setting (30%), followed by middle school at 25%, while high school groups had the least at less than 5%. Implementation for visual supports based on pre-service training was up to 35% for those in an elementary, middle school up to 30%, while high school was less than 20%. Video modeling, VOCA, and pivotal response implementation based on pre-service training accounted for some of lowest EBIs implemented. Those in the elementary and high setting reported less 5% of pre-service in video modeling, however, in the middle school setting it is reported up to 30%. Participants in a high school setting reported implemented less than 5% in VOCA, while those in elementary indicated implementing less than 15%, and middle school less than 10%. Finally, elementary educators reported implementing pivotal response training less than 5%, whereas those in middle and high school settings reported implementing less than 15% of the time.

Although educational setting was significant, the pre-service tended to be infrequent. Elementary participants' implementation of EBIs based on pre-service training in the above areas ranged from less than 5% to up to 60%. Implementation of EBIs based on pre-service training for middle school educators varied from less than 5% up to 45%, while educators in a high school setting spanned from less than 5% to 50%. Overall, those educators in a high school setting reported more infrequent amounts of implementation based on pre-service training.

There were too few cases in the categories educational delivery method and current teaching assignment to run the statistical analysis for the participants in their reported level of pre-service training.

Research question seven examined how demographics differ in their professional development of EBIs. Additionally, data were analyzed to describe how demographics differ in relation to level of professional development the participant has received. There were no overall statistical differences between (a) age; (b) gender; (c) level of education; (d) certification; (e) educational program; (f) years of teaching experience; (g) years of teaching experience with autism; (h) educational setting; and (j) ethnicity. However, there were individual among the above categories.

There was an individual statistical difference for the EBI pivotal response training between the 31-40 and 51-60 age categories. The age group 31-40 reported a higher frequency of professional development toward implementation of EBIs, up to 50%, whereas the 51-60 age group reported less than 10% of training.

Gender was another category that had statistical differences. Differences were noted in the following areas of professional development EBIs training: (a) Peer-Mediation; (b) Self-Management Training; (c) Social Narrative; (d) Social Skills training; (e) Structured Work Systems (f) Video Modeling; and (g) Visual Support. Female participants reporting a higher level of implementation for the previous EBIs, from 40%-70%, while males reported 20%-40% of implementation in the above areas.

With regard to differences between participants' type of certification, there were no overall statistically significant differences. However, there was a statistically significant difference between traditional 4-year and alternative certification with differential reinforcers

from pre-service training. Alternative certification had a higher mean with the level of professional development implementation at 60% and traditional 4-year program at 40% of implementation for this EBI.

Individual statistical differences were also reported in the years of teaching experience and educational setting. In the years of teaching experience category between-subjects effects indicate statistical significance in the following areas: (a) naturalistic training; (b) picture exchange; (c) structured work systems; and (d) visual support. Overall, participants in the 1-5 years teaching experience group had a lower mean score on classroom implementation than the 11-20 years. Those with 1-5 years teaching experience reported less than 15% of the implementation for that EBI, whereas those with 10-20 years experience reported up to 50%.

There were individual statistically significant relationships in the participants' educational setting and implementation of EBIs based on professional development in the following areas: (a) peer-mediation; (b) self-management training; and (c) video modeling. Individual scores show where the differences occur. In peer-mediation and self-management based on professional development training the middle school teaching population reported implementing those two EBIs based on professional development training up to 60%, followed by elementary settings 45% of the time, and high school less than 20%. Implementation for video modeling based on professional development training was also less than 10% of training, while middle school educators reported up to 50%.

Too few cases were reported in the teacher education delivery method and the educational setting categories to run the statistical analysis.

The research examined the question of the relationship between EBIs training for special education teachers and their practice of classroom interventions for children with ASD. The

results indicated that teachers attributed the majority of their implementation of EBIs from training other than a four-year program. In addition to this, the implementation varies among teachers' background, with experience teaching as one of the key elements to implementation of EBIs. Although implementation is evident, it tends to be low. The discussion below provides further insights into the relationships between EBIs training for special education teachers and their practice of classroom interventions.

Discussion

The study found three major trends. First, although there are low to intermediate correlations of statistical significance between pre-service training and implementation of EBIs, there are strong correlations of statistical significance between professional development and implementation of EBIs. Second, when considering demographic background, teachers with six to ten years of experience, particularly teachers with experience teaching children diagnosed with an ASD, reported greater implementation of EBIs that were statistically significant than teachers in other groups. Third, although previous research indicated a gap between theory and practice, this study showed different results. Teachers reported low percentages of pre-service training but frequent professional development toward of EBIs. This section discusses those findings in more detail.

Training and Implementation of EBIs

According to Collet-Klingenberg et al. (2011), school districts are now required to provide appropriate individualized interventions for children with ASD in compliance with federal law. There are major concerns raised from this issue. The issue is guided by the following question: where are teachers getting the training for implementing EBIs?

Before addressing the question, it is important to note a trend in the responses by the participants. The survey instrument was an Evidence-Based Intervention Questionnaire (EBIQ) developed by the researcher. There were four parts to the EBIQ to include the 24 EBIs recommended by the National Professional Development Center for ASD Spectrum Disorder (NPDC-ASD, 2011). When participants responded to the implementation of the 24 EBIs, they had an option to select “uncertainty” with the terminology. None of the respondents selected unknown terminology for any of the 24 EBIs. In other words, they indicated familiarity with the EBIs by not selecting the uncertainty option. Whether teachers received pre-service or professional development training, the indication is that they are at least familiar enough with the EBIs to warrant integrating them into their teaching strategies. The extent of implementation, though, is another matter and discussed below in the section on percentages and implementation.

The Individuals with Disabilities Act (IDEA) became the basis to create rights for students with disabilities. Following this, No Child Left Behind (NCLB) mandated that teachers were to be highly qualified. It also mandated the use of research-based interventions and methodologies to be used by teachers. Then, in 2004 IDEA was amended to mandate the use of EBIs. This left open the issue of where teachers would receive the training in order to comply with federal mandates.

This study found that teachers receive training from a combination of areas. First, correlations were intermediate between pre-service training and implementation of EBIs. In other words, teachers reported that they were exposed to the 24 EBIs during their pre-service training, however their implementation of the EBIs was moderately based on their pre-service training. Ludlow et al. (2007) indicated specialized training in ASD as an area in need of improvement. Teacher preparation programs must address the skills educators need to maintain

compliance (Lee et al., 2011). According to Ludlow et al. (2007) curriculum for teacher preparation training programs should include explicit instruction on educational strategies and interventions for students diagnosed with an ASD. This could be one explanation for the intermediate correlation between pre-service training and implementation of EBIs. Ludlow et al. (2007) recommended courses that include legal topics, characteristics of autism, evidence-based interventions, assessment, behavior management, literacy, and mathematics as well as providing methods, strategies, and skills necessary to plan, implement and evaluate educational planning for students with ASD. Strain et al. (2011) described exposure to field experience and methodology teaching concepts as essential components of pre-service training. West Virginia University has responded to this demand and has expanded the certification programs it offers to include courses that provided specialized training for future special education teachers who desire to work with students with ASD (Ludlow et al., 2007). Portland State University in Oregon is another university that has taken action by integrating EBIs special educational curriculum with pre-service teachers in order to develop highly qualified educators (Strain et al., 2011). Its mission is to provide pre-service EBIs training that develops an educator's analytical skills needed to establish IEPs which included appropriate EBIs (Strain et al., 2011).

Second, the strongest correlations were between teachers' training through professional development and implementation of EBIs. Teachers more strongly attributed their implementation of EBIs based on professional development training than pre-service training. Tincani (2007) emphasized everyday barriers that may affect an educator's level of classroom implementation of EBIs. Addison et al., (2004) identified teacher resources for EBIs could be a major barrier in the execution of EBIs. Implementation of EBIs for children with ASD is vital to their educational prognosis (Carnhan et al., 2011).

The National Research Council identified teacher training in ASD as an area in need of improvement in programs and specialized training (Ludlow et al., 2007). Busby et al. (2012) stated limited training opportunities may obstruct the educator's motivation to take on the challenge of educating a student with ASD. Teachers who are not confident with their ability to execute learning strategies are more likely to display performance deficits (Busby et al., 2012; Lee, Patterson, & Vega, 2011). Lee et al. (2011) affirmed professional development can increase teacher confidence and problem solving skills. Teachers who have a low self-perception of their abilities will typically demonstrate negativity in their attitudes and reactions to complicated situations that call them to be problem-solvers (Lee et al., 2011). Courtade et al. (2010) implicated educational reformation is to provide training opportunities for veteran teachers who are not equipped with adequate EBIs strategies. Professional development that incorporates EBIs and is based on the training needs can be effective along when selecting in-service topics. Based on the examination of the training levels and classroom implementation, district training needs can be identified based on current practices. Guskey (2009) recommended special education programs utilize the recommendations of content experts that is based on empirical data. Professional development offers educators an opportunity to gain skills that are necessary to execute EBIs (Lee et al., 2011). Lee et al. (2011) explained teachers who have received adequate training are more apt to implement varied EBIs, as well as hold higher educational standards for students diagnosed with an ASD. Educators who are confident in their abilities tend to be more motivated to face challenges and accept responsibility for their role in education (Busby et al., 2010).

Delving deeper into the issue, the question can be raised as to whose responsibility it is to provide training. Should this be a curricular concern with pre-service training or does the bulk of

the responsibility reside with service centers and districts to be a part of professional development? Teacher college preparation programs are critical in the development of the educators' skill to execute strategies that directly address the needs of students (Lee et al., 2011). Lee et al. (2011) proclaimed universities are responsible for training special educators with skills that are applicable to their position (Lee et al., 2011). Ludlow et al. (2007) agreed that universities must develop curriculum that adequately prepares teachers for today's classroom. Emmons et al. (2009) stated pre-service training include EBIs.

The recent inflation of cases of children with ASD, along with the limited supply of experts has impacted the level of pre-service college preparation (Addison, Lerman, Kuhn, & Vorndra, 2004). Ludlow et al. (2007) explored how universities responded to the need for more qualified special educators in the field of autism and found West Virginia University has begun expanding special education courses to included ASD topics. Added to the course list were specific courses that dealt with the implementation of EBIs (2007).

Berry et al. (2011) indicated pre-service preparation and professional development training can enable special education teachers to uphold federal and state legislation (Berry et al., 2011). Busby et al. (2012) claimed teachers who do not receive sufficient pre-service or professional training, affect a teacher's perception, motivation, and ability to maintain federal compliance. Lee et al. (2011) found that in-service professional development can also contribute to increase the special educator's perception of their teaching ability and skills need to face challenges associated with teaching students with an ASD.

Although it is imperative for universities to evaluate their current programs and be reflective of the current educational climate, the ultimate responsibility of implementing EBIs falls on the individual school districts. White and Mason (2004) advised that special educators

be informed and have a clear understanding of their legal obligation to implement EBIs. Ryan et al. (2011) reported lawsuits in special education as the main source of litigation cases for school districts. Etscheidt (2003) and McDonough (1998) investigated the rising cost involving students with ASD is increasing and exceeding in cost in comparison to other special education cases. Districts have to provide evidence that document the implementation of EBIs when resolving litigation complaints (Zikerel, 1997). EBIs serve as protection for potential lawsuits because it supports what is deemed as appropriate educational strategies used in IEPs. Collet-Klingenberg et al. (2011) reported intervention practices and district based guidelines in developing special education program for children with ASD lacked empirical evidence. Simpson (2004) indicated educators that do not implement EBIs may impede the development and progress for students with an ASD.

The California Department of Education has responded to this question by updating training requirements for both their new and veteran teachers in which they are all required to take a cohort of course on EBIs strategies for students with ASD (McDonough, 2008). McDonough (2008) reported teachers need to complete the required sequence of courses training in order to obtain or maintain their teacher certification. The state of California set the standard and gave the responsibility back to educators individually. However, the United States Department of Education, through the authorization of NCLB 2001 and IDEA 2004, regulates districts by dictating the execution of EBIs as a component to maintain compliance (DOE, 2011). Creating EBIs training opportunities in both pre-service and in-service is essential because knowledge of EBIs is not an option for school districts. Per federal law it is mandated they occur (Collet-Klingenberg et al., 2011; Gabriels & Noland, 2004).

Demographics and Implementation of EBIs

Easton (2008) wrote that federal mandates have established a new set of challenges for administrators and teachers to increase the levels of expertise. However, expertise can come from a number of areas, such as type of training, years of experience, exposure to elementary, middle, and high school settings, as well as where certification was acquired. This may be explained with issues raised by Busby et al. (2012). Busby et al. related that perceptions of teachers, who are early in their career, regarding students with ASD were challenging, time consuming, complicated, and excessive with educational planning. The results of this study unveiled years of teaching experience makes a difference when implementing EBIs.

From the study, teachers with 1-5 years teaching experience scored the lowest percentages of implementing EBIs. Special educators entering the field attributed lack of training, professional frustration, and fatigue as significant hurdles when transitioning from pre-service training to the classroom (Stempien, 2012). Lee et al. (2011) reported that new teachers experienced low school support and heavy workloads, which diminish their confidence in the job. The demands of being new to the profession, as well as the heavy demands of the job, seem to impact their implementation of EBIs, as teachers who are new to the profession. Research uncovered that many new teachers did not feel adequately prepared for their role as a special education (Stempien, 2002). Stempien (2002) discovered new special education teachers are more likely to leave their profession than other teachers. Combined with Busby's et al. (2012) perspective of the consuming nature of the job, it helps explain the results.

Additionally, the group with 11+ years' experience also scored lower than the 6-10 experienced group. Stempien (2002) attributed challenges of a new special educator to

frustration and fatigue stemmed from being unprepared the demanding teaching position. Lee et al. (2011) also contributed the lack of professional support as a factor to decrease novice teachers' self-efficacy. In addition, Petkovic et al. (2012) found that teachers with 6-10 years of service demonstrate lowest levels of depersonalization with their job, in comparison to 0-5 and 11+ categories. The level of implementation may be contributed to the emotional connection this group has with their students and occupation (2012). Petkovi et al. (2012) contributed the demands of special educations, the time needed for students to obtain skills, and parental standards as items that impact teacher burn out rates for both new and veteran teachers with 11+ years of experience. Educating students with disabilities can be described as strenuous (2012). Stempien (2002) explained a decline in veteran teacher performance is often related to unrelieved amounts of job related stress.

The group with the highest percentages of implementation of EBIs is the 6-10 years' experience group. This could be for a number of reasons. First, they have settled into the position and are comfortable with their job. Second, the 6-10 years experienced group may have the benefit of colleges and universities, as well as professional development efforts providing greater focus on training. Their background may include districts and college programs that have responded to the federal mandates and they have received the training necessary to comply. Although, EBIs have been in existence for many years they were not mandated until No Child Left Behind Act (NCLB) of 2001 and amendments of the Individual with Disabilities Act 2004 were enacted. In other words, timing may have played a part in their implementation.

Gender also exhibited a large gap between males and females with females scoring much higher in several categories of implementation of EBIs. This can be explained according to a recent study that found females reported higher levels of personal satisfaction in their special

education career, whereas men exhibited greater levels of depersonalization and emotional exhaustion (Petkovic, Macesic, Balos, Misic, & Djordjevic, 2013). Eichinger (2000) analyzed gender roles and found differences among levels of job satisfaction and stress. Further research indicated a strong correlation between gender traits with levels of job satisfaction or job stress (Eichinger, 2000). Petkovic et al. (2013) identified females as more emotionally connected to their job, whereas males experience greater levels of emotional exhaustion. In turn females have conveyed higher levels of job satisfaction (2013).

Percentages, Training, and Implementation of EBIs

Tincani (2007) stated that there are many challenges educators face in the acquisition of knowledge and implementation of EBIs. Ludlow et al. (2007) also reported a shortage of educational professionals who receive specialized training in ASD. Although teachers are now required to implement EBIs, they lack appropriate training in both college pre-service courses and district sponsored professional development (Emmons et al., 2009). Lee et al. (2011) emphasized the importance of universities to review teacher preparation programs to ensure they include EBIs. Based on the results of the study it can be noted that teachers are exposed to EBIs during their pre-service and in-service professional training, however, is the frequency of the training enough to comply with federal standards?

The results of pre-service analyses tend to represent low numbers. Many results revealed implementation of EBIs did not exceed 50% (frequently). In fact, teachers reported implementing EBIs less than 30% of based on pre-service. When they do, they tend to be in areas of picture exchange, peer-mediation, parent-implement interventions, task analysis, naturalistic training, discrete trial training, pivotal response training, self-management, social narratives, computer-aided instruction, structured work systems, video modeling, and VOCA.

Pivotal response training was implementation was significantly the least at than 10% based on pre-service training and in-service professional training, while redirection was consistently reported as the highest EBI implemented based on pre-service and in-service training for redirection which was up to 60%. There is a need to develop curriculum for teacher preparation training programs to equip teachers with actual strategies for today's classroom (Ludlow, Keramidas, & Landers, 2007). Hendricks (2011) attributed the disparity among skills to the availability of teacher certification programs in the area of autism. Currently, Texas only offers one generalist licensure in special education that includes grades pre-kindergarten to twelfth grade (TEA, 2013).

The assessment of the level of training received for both pre-service and professional development is imperative, as these are the settings where special educators receive the knowledge and tools that enable them to comply with federal legislature (Collet-Klingenberg et al., 2010; DOE, 2011). This study indicates that acquisition of knowledge is not necessarily the major problem. From the data it can be noted that professional development training was intermediate. Six EBIs were identified as most infrequent implemented based on their professional development training were: self-management; social narratives; structured work systems; pivotal response training; video modeling; and VOCA. It was interesting that the range of professional development included the same two EBIs: pivotal response training and redirection. Based on professional development training, pivotal response was implemented 30% of the time, while redirection was up to 70%.

An explanation for this pattern may be the complexity of the EBIs. While pivotal response training contains more procedural steps to identify target behaviors in areas of motivation, response, self-management, and self-initiation (Vismara & Bogin, 2009).

Redirection is a two-step process (Nietzel, 2009). The first step is to stop the student from engaging in a behavior that interferes with their learning and then redirect them to engage appropriately (Nietzel, 2009).

The percentage of implementation based on statistical analyses tends to be in the region of 50%-70%. Simpson (2004) affirmed the level professional training and lack of preparation programs for professionals who educated children with ASD is positively correlated to EBIs usage. However, the study showed extremely low results of implementation of EBIs based on pre-service training and more frequent (up to 50%) implementation of EBIs professional development training.

Low percentages of implementation are often significant with age. Those teachers 51 years old and older tended to report lower implementation of EBIs. Although, there were no statistical differences found among the age categories, in general, and with pre-service training, a statistical difference was noted among individual categories of age and implementation based on professional development training. Participants in the 51+ category reported a lower level of implementation of EBIs from professional development training. Working with students with ASD can be perceived as challenging (Lee, et al., 2011). Over time this may impact teacher performance. Petkovic et al. (2012) explained studies have shown a positive correlation between the age of special and the level of teacher burn out. Additionally, reform to special education law that imitated the implementation of EBIs was enacted in 2004, approximately 10 years ago (DOE, 2012). So, again timing and relevance may be an issue with age and implementation of EBI.

Examining the relationship between training and practice of EBIs is critical information for districts because it aids educational leaders in developing quality educational plans and in

maintaining federal compliance (Collet-Klingenberg et al., 2010; DOE, 2011). Analyzing areas of past training and current application of EBIs are essential in planning professional development for teachers. The existing data could aid in identifying areas of professional development topics special educators may need. Based on the reporting of these areas, training models and teacher education can be developed (Larsson et al., 2003).

Implications

The National Research Council has identified teacher training in EBIs for individuals with ASD as an area in need of improvement in programs and specialized training (Ludlow et al, 2007). Research suggests that the training in both pre-service and professional development programs is inadequate (Courtade et al., 2010; Guskey, 2009; Lee et al., 2011).). Additionally Grossman and Barrozo (2007) urged professionals to recognize there is a “... moral and ethical obligation to identify, treat and care for people with autism spectrum disorders so that they can attain their full potential” (p. 9). Many studies have supported the correlation of training of EBIs and level of implementation. A recent study indicated special education teachers in Georgia as implementing the 24 EBIs recommended by the National Professional Development Center for ASD (NPDC-ASD) approximately 30% of the time (Hendricks, 2011). Additionally, another study performed in Virginia that surveyed 498 special educators indicated the level of classroom implementation to have a mean score of 2.55 which was described as relatively low (Hendricks, 2011). This study also provided an indication of low results of EBIs implementation, by special education teachers educating students with ASD, based on both their pre-service and in professional development trainings in this urban school district.

No Child Left Behind (NCLB) mandated that teachers were to be highly qualified and required the research-based interventions and methodologies (DOE, 2012). Amendments to

IDEA included regulations that governed the use of EBIs. However, this question of where and how teachers would receive the training whether teachers received pre-service or professional development training and the extent of implementation in order to comply with federal mandates are other matters that remain.

Ludlow et al. (2007) indicated specialized training in ASD as an area in need of improvement. This study found correlations were intermediate between pre-service training and implementation of EBIs. In other words, teachers reported that they were exposed to the 24 EBIs during their pre-service training; however their implementation of the EBIs was moderately based on their pre-service training. Lee et al. (2011) recognized teacher pre-service training essential in supporting educators in maintaining federal compliance. According to Ludlow et al. (2007) curriculum for teacher preparation training programs should include explicit instruction on educational strategies and interventions for students diagnosed with an ASD.

Participants with 6-10 years of experience reported a higher level of classroom implementation of the EBIs listed above than those with 11-20 years teaching experience. Still, the percentages at almost 50% for categories of 6-10 years of experience and 11-20 years of experience. Teachers entering the field having 5 years of experience or fewer and others who have over 15 years of service are reporting significantly lower levels of classroom implementation of EBIs. The discovery of the minimal pre-service training sheds light on the low numbers reported for teachers with less than 6 years of experience (Stempien, 2002). For the 11-20 years of service it is possible teachers in this category may be experiencing fatigue or stress that has accumulated over the years (Stempien, 2002). Another possible explanation is amendments regarding special education law only occurred in the last decade. Although EBIs do have a long history, they were not mandated until 2004. The increase in standards may create a

gap between teacher preparation programs and standards that teachers are obligated to adhere. If programs adhere to federal mandates, teachers in the future may be more qualified to implement EBIs than seen from previous studies and a larger measure of implementation than what this study found.

The results of this study appear encouraging, though. Previous literature indicated large gaps between training and implementation of EBIs (Bowen et al., 2011; Dingfelder & Mandell, 2010; Guskey, 2009). The results of this study indicate that strides are being made to close those gaps. All participants indicated knowledge of the 24 best practices. Between pre-service training and professional development, they are being implemented to some degree.

Fogarty and Brian (2009) cited an examination of professional development training of EBIs will assist administrators and educational leaders to identify needs for EBIs training, communicate them as standard practices, and embed EBIs into professional development series. The U.S. Department of Education (2011) deemed training and evaluation of EBIs as a matter of urgency and labeled it is a necessary component in maintaining federal compliances (DOE, 2011). Easton (2008) suggested districts utilize district needs assessments to improve their current practices. Guskey (2009) stressed teacher training as is a direct factor for student success (Guskey, 2009). Fogarty and Brian (2009) agreed teacher training that addresses the needs of a school based on data are essential when designing and creating an effective a professional development series to maximize outcomes for both staff and students. Based on the findings of the study professional development has a strong correlation to classroom implementation of EBIs. Though there are no causal inferences, the study revealed as training increases the level classroom implementation of EBIs increases.

Although Bowen et al. (2011) identified gaps in application of EBIs, results of this study show intermediate implementation based on frequent professional development and occasional implementation of EBIs based on pre-service training. It can be inferred professional development enabled educators to gain skills and knowledge that supported the implementation of EBIs. However, it is still critical to examine the state of pre-service training in this geographic region. States that do not have standard licensures in autism education will experience variations of teacher skill sets. Currently, teacher certification in ASD is not available in Texas. Other states, such as West Virginia expanded their certification programs to include courses that provided specialized training and licensure in ASD (Ludlow et al., 2007). Portland State University in Oregon is another university that has taken action by integrating EBIs special educational curriculum with pre-service teachers in order to develop highly qualified educators (Strain et al., 2011). Its vision is to provide pre-service EBIs training that develops an educator's analytical skills needed to establish IEPs which included appropriate EBIs (Strain et al., 2011).

Future Research

This study recognized federal mandates as the basis to emphasize implementation of EBIs. Research studies have confirmed low levels (less than 30%) of implementation of EBIs in Georgia and West Virginia (Hendricks, 2002). Additionally, the results of this study indicated low levels of implementation based on pre-service training (less than 30%) and professional development (less than 50%). This study could be duplicated to find existing patterns in the results of percentage of classroom implementation based on training. Emmons et al. (2009) and Tincani (2004) both argued that universities throughout the nation need to provide upcoming

teachers with the knowledge to handle the evolving dynamics of the educational climate while upholding federal mandates.

Future studies can include the examination of pre-service courses, special education teacher certification programs, as well as pre-service training offered through service centers and the emphasis placed on EBIs. Emmons et al. (2009) suggested university pre-service training programs need to include the acquisition of knowledge and skills necessary to execute EBIs. A study could look at relationships between time devoted to compliance issues and time devoted to topics focusing on the implementation of EBIs. According to Lee et al. (2001) universities have a responsibility to train special educators with skills that are applicable to their position.

At the time of the study Texas did not require any prerequisites or specialized certification to teach students diagnosed with an Autism Spectrum Disorder [ASD] (TEA, 2012). However, the California Department of Education has updated training requirements for both their new and veteran teachers in which they are all required to take a cohort of course on EBIs strategies for students with ASD to obtain and/or maintain state certification (McDonough, 2008). The state of California increased their standards for educators who teach students with ASD to align with federal mandates that require execution of EBIs (2008). A comparison of differences among pre-service and professional development and the implementation of EBIs according to state mandates might reveal more enlightening results. A larger sample size would be beneficial to provide a comparative analysis.

Demographic information in this study showed significant results. Further studies should look at implementation of EBIs more in depth according to demographic data. This study showed differences in a number of areas, such as gender, experience, age, and type of school. Each of these should be explored more in depth, particularly type of school. For example this

study was conducted in an urban school district. Future studies could expand this demographic and review schools in rural, urban, and suburban areas.

Future research should look at the relationship between the quality of professional development and implementation of EBIs. Hendricks (2011) examined six educational competencies in autism based on Virginia state guidelines. These competencies included: general autism knowledge; individualized educational planning and strategies; communication; social skills; behavior; and sensory development (2001). Furthermore, studies could examine the extent that pre-service programs focus on skill development of the above competencies. From a skill based perspective the accuracy and effectiveness of the execution of EBIs can be further developed. Although there are 24 listed as best practices, specific ones could be determined to be the most effective? Another study could examine the use and impact of specific EBIs.

Finally, pre-service and professional development programs are expensive to operate. Future research should look at the relationship between cost of litigation that districts pay and the extent of professional development they devote to special education. Additionally, analysis can be done on funding, allocations to different types of programs, and emphasis on training for EBIs. The National Professional Development Center (NPDC-ASD) has offered their assistance to states across the nation in providing resources and training on the 24 EBIs investigated in the study (2012). Additionally, the NPDC-ASD website provides training modules, content assessment for EBIs, and training briefs for the 24 EBIs that were utilized in the study. States submit an application for direct consultation on the 24 EBIs (2012). Once selected by the NPDC-ASD, states must demonstrate dedication to increasing implementation levels of EBI, as well as share some of the expenditures associated with training and implementation (2012). States that are chosen will receive two years of support in developing strategic professional

development plans, training resources, and onsite consultation (2012). As of 2010 the following 12 states have participated in NPCD-ASD quest to enhance teacher professional development training for ASD (2012). These states include: Texas, California, New Mexico, Rhode Island, Vermont, Idaho, Kentucky, Indiana, Minnesota, Wisconsin, Michigan, and Virginia (NPDC-ASD, 2012). Texas was selected in 2010 and is in its second year training over the 24 EBIs included in the study (NPDC-ASD, 2012). In Texas educational Region 6 in Huntsville, Region 13 in Austin, and Region 19 in El Paso were selected as sites that would receive training and consultation by NPDC-ASD (2012). Since the urban school district in this study is not included in the above regions receiving the training, a comparative model may be used to investigate if there are statistical differences in the level of classroom implementation of such EBIs among the Texas educational regions.

Summary

The purpose of the study was to examine the relationship between EBIs training for special education teachers and their practice of classroom interventions for children with ASD. Since 2004, districts have been mandated by both state and federal mandates to utilize EBIs for students in special education (Bowen et al., 2011). The National Research Council has identified the lack of teacher training programs and specialized training in ASD as an area in need of improvement (Ludlow et al., 2007). This study showed that growth is being made. First, although there are low to intermediate correlations of statistical significance between pre-service training and implementation of EBIs, there are strong correlations of statistical significance between professional development and implementation of EBIs. Second, when considering demographic background, teachers with six to ten years of experience, particularly teachers with experience teaching autistic children, reported greater implementation of EBIs that were

statistically significant than teachers in other groups. Third, teachers reported low percentages of pre-service training but frequent professional development toward of EBIs. Results indicated implementation based on pre-service training to be less than 30% for a majority of the EBIs and up to 50% based on professional training. Although the implementation levels are intermediate, there is still potential for growth. Additionally, districts can continue to investigate the effectiveness of professional development training and implementation of EBIs. Simpson (2004) indicated training is also critical for other parties who are responsible for educational planning for students. The educational prognosis for students diagnosed with ASD will rely heavily on interventions, making it crucial to build bridges among the various entities that are involved with educating these children.

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Appendix A: Invitation

Evidence-Based Intervention Questionnaire

Welcome!

I am Kristin Hoover a doctoral student at Texas A&M Corpus Christi and fellow special education teacher seeking your professional input. You are invited to participate in a doctoral research study that will investigate the level of training special education teachers received on Evidence-Based Interventions (EBIs) for children diagnosed with autism during the pre-service and professional development training.

Special education teachers face a great challenge in providing educational strategies for students with autism because it is a complex neurological disorder. In our nation today there are approximately 1 out of 88 children are reportedly diagnosed with autism (National Center for Disease Control [NCDC], 2012). Autism is the leading diagnosis with more cases than childhood cancer, diabetes, and pediatric AIDs combined (Batista, Christodulu, Crawley, DeLuke, Frye, Llaneza, 2010). The possible benefits of participation are increase training opportunities for special education teachers in their pre-service program and in professional development series.

On the next page you will find a "Consent Form" which will give you further detailed information of the procedural safeguards of the study. If you choose to participate a teacher survey. Your participation is valued and appreciated.

Thank you for your time and support to continue to improve the lives of children diagnosed with autism.

Sincerely,

Kristin Hoover
Primary Researcher

***1. Continue to the consent form?**

- ☐ Yes
☐ No

Appendix B: Consent Form

Evidence-Based Intervention Questionnaire

Consent Form

This form is to provide you information that may affect your decision as to whether or not to participate in this research study. If you decide to participate in this study, this form will also be used to record your consent. You have been asked to participate in a research project studying the level of training special education teachers received in a pre-service and in professional development trainings on Evidence-Based Interventions (EBIs).

The purpose of this study identify the relationships between pre-service training and professional development to classroom usage of EBIs. Teacher demographics will also be reviewed to examine variances among the level of training reported. You were selected to be a possible participant because you are identified as a special education teacher in your district teaching grade levels pre-k to 12th grade students.

What will I be asked to do?

If you agree to participate in this study, you will be asked to complete a 5-10 survey to indicate the level of training you received and the usage of 24 evidence based interventions.

What are the risks involved in this study?

The risks associated in this study are minimal, and are not greater than risks ordinarily encountered in daily life. The study is not connected with the district and is independent of any employment related issues with the district. Participation is entirely voluntary, you may withdraw at anytime.

What are the possible benefits of this study?

Special education teachers face a great challenge in providing educational strategies for this complex neurological disorder. The possible benefits of participation are increase training opportunities for special education teachers in their pre-service program and in professional development series.

Results may be used for additional publication in peer reviewed research journals to contribute to better understanding of the issue for the benefit of the larger academic community.

Do I have to participate?

No. Your participation is voluntary. You may decide not to participate or to withdraw at any time without your current or future relations with Texas A&M University-Corpus and your district being affected.

Who will know about my participation in this research study?

Safeguards will be set in place in order to ensure the data obtain is secure and remains anonymous. The online survey will not ask for information that reveals your identity. The records of this study will be kept private. No identifiers linking you to this study will be included in any sort of report that might be published. Research records will be stored securely and only Kristin Hoover will have access to the records. Dr. Randall Bowden, faculty advisor, will examine the data for analyses for results.

Whom do I contact with questions about the research?

If you have questions regarding this study, you may contact:

Kristin Hoover
(361)779-8314
kaldrigh@yahoo.com or
Dr. Randall Bowden
(361)825-2537
Randall.bowden@tamuoc.edu

Whom do I contact about my rights as a research participant?

This research study has been reviewed by the Research Compliance Office and/or the Institutional Review Board at Texas A&M University-Corpus Christi. For research-related problems or questions regarding your rights as a research participant, you can contact Erin Sherman, Research Compliance Officer, at (361) 825-2497 or

Appendix C: Evidenced Based Intervention Questionnaire

| Evidence-Based Intervention Questionnaire | | | | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Evidence-Based Intervention Questionnaire | | | | | | | |
| Rate the level of your college education and professional development training for each intervention; and mark the frequency the intervention is used classroom in the classroom. | | | | | | | |
| If the Intervention is a term that you are unfamiliar with, mark U (unknown terminology) and proceed to the next intervention. | | | | | | | |
| The levels are: | | | | | | | |
| 1 = none; | | | | | | | |
| 2 = rarely—less than 10%; | | | | | | | |
| 3 = occasionally—up to 30%; | | | | | | | |
| 4 = frequently—up to 50%; | | | | | | | |
| 5 = usually—up to 70%; | | | | | | | |
| 6 = extensively—up to 90% or more. | | | | | | | |
| Your input is appreciated! | | | | | | | |
| *3. Behavioral Prompting (antecedent strategies) | | | | | | | |
| | Unknown Terminology | 1 | 2 | 3 | 4 | 5 | 6 |
| Pre-Service/College Education | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Professional Development | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Classroom Implementation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| *4. Behavioral Reinforcement (consequences) | | | | | | | |
| | unknown terminology | 1 | 2 | 3 | 4 | 5 | 6 |
| Pre-Service (College Education) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Professional Development | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Classroom Implementation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| *5. Task analysis and Chaining (step-by-step instructions) | | | | | | | |
| | unknown terminology | 1 | 2 | 3 | 4 | 5 | 6 |
| Pre-Service (College Education) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Professional Development | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Classroom Implementation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

6. Time delay*(waiting for longer for a response, reducing prompts)**

| | unknown terminology | 1 | 2 | 3 | 4 | 5 | 6 |
|---------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Pre-Service (College Education) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Professional Development | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Classroom Implementation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

***7. Computer Aided Instruction**

| | unknown terminology | 1 | 2 | 3 | 4 | 5 | 6 |
|---------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Pre-Service (College Education) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Professional Development | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Classroom Implementation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

8. Discrete trial training*(one on one instruction)**

| | unknown terminology | 1 | 2 | 3 | 4 | 5 | 6 |
|---------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Pre-Service (College Education) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Professional Development | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Classroom Implementation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

9. Naturalistic Training*(learning in a natural environment)**

| | unknown terminology | 1 | 2 | 3 | 4 | 5 | 6 |
|---------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Pre-Service (College Education) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Professional Development | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Classroom Implementation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

10. Parent-Implemented Interventions*(using strategies already used by parent)**

| | unknown terminology | 1 | 2 | 3 | 4 | 5 | 6 |
|---------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Pre-Service (College Education) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Professional Development | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Classroom Implementation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Evidence-Based Intervention Questionnaire

*11. Peer-mediated instruction

| | unknown terminology | 1 | 2 | 3 | 4 | 5 | 6 |
|---------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Pre-Service (College Education) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Professional Development | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Classroom Implementation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

*12. Picture exchange communication

| | unknown terminology | 1 | 2 | 3 | 4 | 5 | 6 |
|---------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Pre-Service (College Education) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Professional Development | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Classroom Implementation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

*13. Pivotal response training

(strategy to teach student to interact with learning environment)

| | unknown terminology | 1 | 2 | 3 | 4 | 5 | 6 |
|---------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Pre-Service (College Education) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Professional Development | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Classroom Implementation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

*14. Functional Behavior Assessment

(Used to understand possible reasons for behavior)

| | unknown terminology | 1 | 2 | 3 | 4 | 5 | 6 |
|---------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Pre-Service (College Education) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Professional Development | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Classroom Implementation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

*15. Environmental Modification

(adjusting learning setting to foster learning)

| | unknown terminology | 1-None | 2 | 3 | 4 | 5 | 6-Extensive |
|---------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Pre-Service (College Education) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Professional Development | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Classroom Implementation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Evidence-Based Intervention Questionnaire

*16. Functional communication Training

(strategy to extinguish one behavior and replace with appropriate behavior)

| | unknown terminology | 1 | 2 | 3 | 4 | 5 | 6 |
|---------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Pre-Service (College Education) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Professional Development | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Classroom Implementation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

17. Redirection

| | unknown terminology | 1 | 2 | 3 | 4 | 5 | 6 |
|---------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Pre-Service (College Education) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Professional Development | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Classroom Implementation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

*18. Extinction

(strategy to eliminate behavior)

| | unknown terminology | 1 | 2 | 3 | 4 | 5 | 6 |
|---------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Pre-Service (College Education) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Professional Development | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Classroom Implementation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

*19. Differential reinforcement

(strategy to aid student to learn alternative behavior)

| | unknown terminology | 1 | 2 | 3 | 4 | 5 | 6 |
|---------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Pre-Service (College Education) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Professional Development | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Classroom Implementation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

*20. Self-management

(Used to for student to document their own behavior)

| | unknown terminology | 1 | 2 | 3 | 4 | 5 | 6 |
|---------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Pre-Service (College Education) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Professional Development | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Classroom Implementation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Evidence-Based Intervention Questionnaire

*21. Social narratives

(stories created for student to address skill/behavior)

| | unknown terminology | 1 | 2 | 3 | 4 | 5 | 6 |
|---------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Pre-Service (College Education) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Professional Development | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Classroom Implementation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

*22. Social Skills training groups

(teaching social skills curriculum)

| | unknown terminology | 1 | 2 | 3 | 4 | 5 | 6 |
|---------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Pre-Service (College Education) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Professional Development | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Classroom Implementation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

*23. Structured work systems

(production of visual and interactive directive steps to engage student in academics or life skills)

| | unknown terminology | 1 | 2 | 3 | 4 | 5 | 6 |
|---------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Pre-Service (College Education) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Professional Development | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Classroom Implementation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

*24. Video modeling

(using video media that allows students to view expected behavior and processes the information first.)

| | unknown terminology | 1 | 2 | 3 | 4 | 5 | 6 |
|---------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Pre-Service (College Education) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Professional Development | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Classroom Implementation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Evidence-Based Intervention Questionnaire

*25. Visual supports

(visual aids to support student with activities)

| | unknown terminology | 1 | 2 | 3 | 4 | 5 | 6 |
|---------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Pre-Service (College Education) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Professional Development | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Classroom Implementation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

*26. VOCA/ speech generating devices

(electronic communication device)

| | unknown terminology | 1 | 2 | 3 | 4 | 5 | 6 |
|---------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Pre-Service (College Education) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Professional Development | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Classroom Implementation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

27. Level of Education:

- ☐ Bachelors
☐ Masters
☐ Doctorate

*28. Please indicate below how your special education certification was obtained:

- ☐ Traditional 4 year college preparation
☐ Alternative teacher certification program
☐ Already held teacher certificate and was certified by examination

*29. If you were alternatively certified, where was the certification received?

- ☐ Not alternatively certified
☐ College or university
☐ Service center
☐ Other

Evidence-Based Intervention Questionnaire

***30. What was the primary delivery system for your education/training?**

- ☐ Face-to-face
- ☐ Online
- ☐ Hybrid (combination of online and face-to-face)
- ☐ Other

***31. Years of Teaching Experience:**

- ☐ First Year Teacher
- ☐ 1-5 years
- ☐ 6-10 years
- ☐ 10-20 years
- ☐ 21+ years

***32. Years of experience teaching children with autism?**

- ☐ First Year Teacher/ 0
- ☐ 1-5 years
- ☐ 6-10 years
- ☐ 10-20 years
- ☐ 21+ years

***33. Current level of students you educate:**

- ☐ Elementary
- ☐ Middle School
- ☐ High School

***34. Setting of your current job assignment (select only your primary one):**

- ☐ Inclusive/ Co-teaching environment
- ☐ Adaptive Education (AE) environment
- ☐ Resource classroom environment
- ☐ Social skills program, such as a Program for Academic Language Support (PALS) Unit

Evidence-Based Intervention Questionnaire

***35. Which category below includes your age?**

- ☐ 22-30
- ☐ 31-40
- ☐ 41-50
- ☐ 51-60
- ☐ 61+

***36. Gender**

- ☐ Female
- ☐ Male

***37. Which race/ethnicity best describes you? (Please choose only one.)**

- ☐ American Indian or Alaskan Native
- ☐ Asian / Pacific Islander
- ☐ Black or African American
- ☐ Hispanic American
- ☐ Indian subcontinent
- ☐ White / Caucasian

Appendix D: Outside Research Approval



Office of Assessment and Accountability

CORPUS CHRISTI INDEPENDENT SCHOOL DISTRICT

P. O. Box 110 Corpus Christi, Texas 78403-0110

3130 Highland Avenue Corpus Christi, Texas 78405

Office: 361-844-0396 Fax: 361-886-9371

Website: www.ccisd.us

May 2, 2012

Kristin Hoover
4205 Townsend
Corpus Christi, Texas 78415
E-mail: kaldrigh@yahoo.com

Dear Ms. Hoover:

Conditional permission is granted to you to conduct your research in the Corpus Christi Independent School District (District). Final permission is at the discretion of each campus principal. I have attached a list of campuses with telephone numbers so that you may contact the principals.

It is a pleasure to welcome you to the District as you begin this significant research initiative. At the conclusion of your work, please provide my office with a copy of the results.

Should you need additional assistance during your study, please feel free to contact me at 361-844-0396, extension 44253 or via e-mail, James.Gold@ccisd.us.

Sincerely,

James H. Gold
Executive Director

JHG/mdf

Enclosure

cc: Mr. D. Scott Elliff
Bernadine Cervantes
Campus Principals