A MIXED METHODS STUDY EXAMINING THE INSTRUCTIONAL ENVIRONMENT FOR STUDENTS WITH AUTISM IN GENERAL EDUCATION ELEMENTARY CLASSROOMS

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AUTHORIZATION TO SUBMIT

DISSERTATION

This dissertation of Lori Hawthorne-Schlichting, submitted for the degree of Doctor of Philosophy in Education with a major in Educational Leadership and titled A MIXED METHODS STUDY EXAMINING THE INSTRUCTIONAL ENVIRONMENT FOR STUDENTS WITH AUTISM IN GENERAL EDUCATION ELEMENTARY CLASSROOMS has been reviewed in final form. Permission, as indicated by the signatures and dates given below, is now granted to submit final copies.

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DEDICATION

This work is dedicated to Craig Schlichting and all of those who supported me and made significant sacrifices on my behalf as I undertook this goal.

ABSTRACT

Autism research continues to refine the exact rate of autism; it also attempts to approximate the undiagnosed rate of autism to capture the number of individuals functioning on the high-end of the spectrum without a formal diagnosis. Whether students exhibiting characteristics of autism have a formal diagnosis or not, many enrolled in public education classrooms are most appropriately served in the general education setting. This study examined the characteristics of students in general education settings to ascertain the number of students diagnosed with autism. Additionally, it investigated the educational practices regularly applied in the general education setting in conjunction with the classroom teacher's knowledge of those practices most beneficial to students with autism. This mixed methods investigation used a survey to examine practices in two Utah school districts. Reported rates of students who were served under an IEP or 504 and identified as having autism were consistent with the Centers for Disease Control (CDC) reporting rates of autism prevalence in the United States. Teachers identified instructional practices effective for students with autism 80% of the time. Additionally, teachers reported they "always" or "often" used 91.7% of the instructional practices in their classrooms that have been identified as effective for students with autism. Fisher's exact test yielded no statistically significant differences between groups of participants. Themes from open-ended survey responses revealed students with significant learning differences impact the delivery of the curriculum, but teachers believe the general education setting is most appropriate for students with learning differences. Teachers also report feeling inadequately prepared to teach students with autism. Data suggests that additional research is needed regarding the design and implementation of universal classroom instructional strategies to meet the needs of all learners in the general education setting.

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Chapter I

Introduction

Autism Spectrum Disorder (ASD), or autism, has become a part of the national narrative. Whether people recognize it when they see it or not, television and motion pictures draw the attention of a broader audience to individuals with autism (Autism Research Institute, 2015; Furlong, 2013; Kurchak, 2013; Neeley-Barnes, Hall, Roberts, & Graff, 2011). Some of the more well-known examples of characters with autism include: Sheldon in television's *The Big Bang Theory* (Lorre, 2007); Ray in the motion picture *Rain Man* (Gruber et al., 1988); Oskar in *Extremely Loud and Incredibly Close* (Skinner, Rudin, & Costas, 2011); both Max and Hank in *Parenthood* (Katims, 2010); and, in the fall of 2015, *Sesame Street* added a character with autism, a girl named Julia, to its popular children's series. For those unfamiliar with autism, perception and understanding of the disorder is gleaned and shaped by portrayals in film and television. As awareness and acceptance of autism in society increases, so does the understanding that autism is a spectrum disorder in which the impairments associated with disability may manifest profoundly or be nearly invisible (Baker, 2002; MacDonald, 2010).

The triad of characteristics consisting of social impairment, communication disorder, and restricted or repetitive movements were first given the label of autism by Leo Kanner in 1943 (Gernsbacher, Dawson, & Hill Goldsmith, 2005, Park & Chitiyo, 2011; Tidmarsh & Volkmar, 2003). The American Psychiatric Association (APA) publishes and routinely updates the *Diagnostic and Statistical Manual of Mental Disorders*, or DSM. Inclusion in the DSM grants a mental disorder existence, making it eligible for formal diagnosis and treatment. It was nearly 40 years after Kanner coined the term "autism" before it was included in the DSM (APA, 1980). Recent research estimates one in every 88 people exhibit characteristics that place them on the autism spectrum (Denning & Moody, 2013; Sansosti & Sansosti, 2012). Data from the Centers

for Disease Control and Prevention (CDC) reported one in every 68 children have been diagnosed with autism (Baio, 2014; Christensen et al., 2012).

Though autism is prevalent in the population and a broader audience is aware of autism through popular culture, parents and caregivers routinely describe experiences of misunderstanding and negative attitudes toward children with autism from both the general populace and immediate family members (Bevan-Brown, 2010: Neeley-Barnes et al., 2011; Safe, Joosten, & Molineux, 2012). Literature documents the evolution of autism from a term historically used to describe a peculiar set of characteristics to a medically recognized disorder in the DSM (APA, 1980; APA, 1994; APA, 2013; Gernsbacher et al., 2005, Park & Chitiyo, 2011; Tidmarsh & Volkmar, 2003). Parallel to the 75 years of autism inquiry, the recognition and response of the education profession has continued to advance. Autism was added as a Special Education Eligibility category in 1991 (Ruble & Wheatley, 2009). There is a significant amount of educational research studying the benefits of inclusionary practices – educating students with disabilities alongside their non-disabled peers in the general education setting -- for students with disabilities (Bevan-Brown, 2010; Downing, Peckham-Hardin, 2007; Dymond, Gilson, & Myran, 2007; Goodman & Williams, 2007; Huang & Wheeler, 2006; McKeon, Alpern, & Zager, 2013). Research suggests inclusion is not only beneficial to students with disabilities in general, but also the general education peers and the professionals who work with both groups of students (Carter & Hughes, 2006; Cole, Waldron, & Majd, 2004; Downing & Peckham-Hardin, 2007).

The mere diagnosis of autism does not necessarily require special education or related services (Goodman & Williams, 2007; Higginson & Chatfield, 2012; Pinborough-Zimmerman et al., 2012). In two different state-specific studies, researchers estimated 20 to 50 percent of children diagnosed with autism did not receive special education services of any kind (Pinborough-Zimmerman et al., 2012. p. 525; Stanford & Reeves, 2009). Moreover, emerging

research suggests an undiagnosed rate of students on the autism spectrum as high as 55% in some elementary school settings (Russell, Ford, Steer, and Golding, 2010). Therefore, the general education teacher can expect to have multiple students in class on a regular basis who are diagnosed with autism but not receiving services as well as students who exhibit multiple characteristics of autism but do not have a formal diagnosis (Finke, McNaughton, & Drager, 2009). It is increasingly important for general education teachers to create a classroom environment beneficial to all learners while addressing the triad of impairments associated with autism.

Statement of the Problem

Research confirms a rise in the occurrence rates of autism in the United States (Brock, 2006; Finke et al., 2009; Gernsbacher et al., 2005; Higginson & Chatfield, 2012; Loiacono & Valenti, 2010; Moores-Abdool, 2010). In Utah, where this research investigation was conducted, statistics mirror this trend. The Utah State Board of Education (USBE) reported 792 students, ages five to 12, identified under the special education classification category of autism in 2004 (USBE, 2015b). The USBE reported 2,717 students, ages five to 12, identified under the special education classification category of autism in 2014 (USBE, 2015b). That is a difference of 1,925 students which equates to a 343% increase in the number of students served under the special education category of autism in ten years.

Although identified through special education procedures, these students spend a great deal of their educational programming in the general education classroom. Thirty-eight percent of the elementary students, ages six to 11, who are classified under the category of autism for special education reporting purposes remain in a general education classroom setting 80% or more of the school day (USBE, 2015b). An additional 19% of the same population of students are in their general education classroom 40% to 79% of the school day (USBE, 2015b).

Combined data from the Utah State Health Department and the USBE suggest that 20 to 50 percent of students with a diagnosis of autism in Utah do not receive special education services of any kind (Pinborough-Zimmerman et al., 2012, p. 525). Moreover, Russell, Ford, Steer, and Golding (2010) examined 14,000 medical records in the United Kingdom and estimated 55% of the sample met the diagnostic criteria for autism but did not have a formal diagnosis. Continued research into the undiagnosed rate of autism is necessary. Educators benefit from knowing the percentage of individuals functioning on the high end of the autism spectrum without a formal diagnosis or special education identification.

With general education teachers increasingly responsible for the comprehensive education of students with autism, educators must include autism-specific teaching skills in general education classrooms in order to meet the needs of an increasing population of students with autism (Finke et al., 2009; Gernsbacher et al., 2005; Kim et al., 2011; Loiacono & Valenti, 2010; Pinborough-Zimmerman et al., 2012; Russell et al., 2010). It would be inefficient for general education teachers to continuously make unique adjustments in instruction and content for each individual learner. Rather, these teachers must be able to design instruction to meet instructional needs of the diverse group of learners in front of them at the time (Jiménez, Graf, & Rose, 2007; Lee & Picanco, 2013).

This study examined general education classrooms in Utah to analyze the support of students with autism in the general education setting. One goal of this research was to determine the rate at which students with autism are present in the general education classroom, and whether these students receive educational support outside of the general education classroom in the form of special education or related services. Additional inquiry was conducted to ascertain the prevalence of common characteristics of students who are not diagnosed with autism. If a reasonable number of students exhibit individual characteristics similar to those found in

students with autism, it may be advantageous and efficient for the general education teacher to create a classroom environment supportive of students with autism. This research sought to identify the general education practices universally beneficial to all learners which may also mitigate the triad of impairments for students with autism, and the extent to which these strategies were used in general education classrooms.

Background to the Study

Autism was added to the DSM III in 1980 by the American Psychiatric Association (APA, 1980) and first included as a special education eligibility category in 1991 (Brock, 2006). In 1980, the DSM III required a person meet six of six identifying criteria for a diagnosis of autism (APA, 1980; Gernsbacher et al., 2005). By 1994, the DSM IV (APA, 1994) published the first revision to the diagnostic criteria for autism. In the DSM IV, there were 16 optional criteria, and an individual had to meet half for a diagnosis of autism (APA, 1994; Gernsbacher et al., 2005). Further, the DSM IV expanded the diagnostic categories from two to five. Asperger's Disorder and Pervasive Developmental Disorder Not Otherwise Specified (PPDNOS) were classified as milder forms of autism, but were unique and individual diagnoses (APA, 1994). Asperger's Disorder and PPDNOS required the subject meet two-thirds of the requirements for autism (Gernsbacher et al., 2005). Appendix A illustrates the difference in diagnostic criteria for autism from 1980 to 1994.

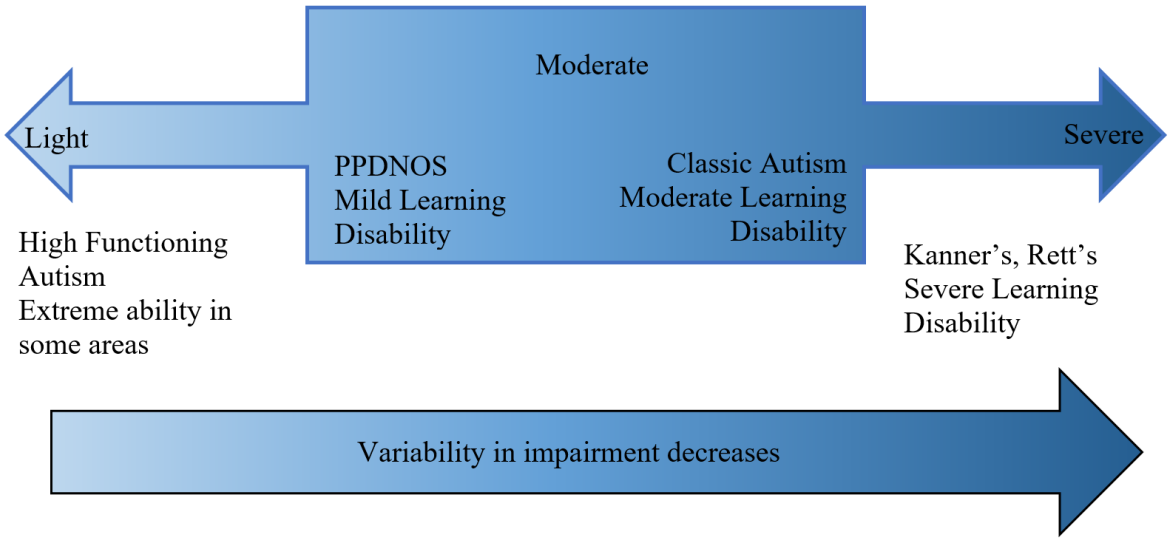
In 2013, the APA again revised the diagnostic criteria for autism. Under the DSM V previously separate disorders, such as Asperger's Disorder and PPDNOS, were integrated into the broad category of autism (APA, 2013). The domains of characteristics were reduced from three to two (APA, 2013). The first domain of diagnostic criteria became impairment in social communication, and the second domain was restrictive interests or repetitive behaviors (APA, 2013). The criteria in these two domains encompassed the triad of characteristics, social

impairment, communication disorder, and restricted or repetitive movements, that defined autism.

Autism is a developmental disorder that presents across a spectrum of impairments. In addition to restricted or repetitive movements, autism is characterized by deficits in communication, socialization, and limited interests or activities (APA, 2013; Huang & Wheeler, 2006; Hussin, Loh, & Hwa, 2008; McKeon et al., 2013; Safe et al., 2012; Tidmarsh & Volkmar, 2003). Figure 1 illustrates autism as a spectrum disorder and the nuances of abilities and impairments.

Figure 1

The Autism Spectrum



As noted earlier, Utah reported a 343% increase over the course of ten years in the number of students served under the special education category of autism (USBE, 2015b). In comparison, the overall state enrollment of students in public education increased by 25% during the same time (USBE, 2015a). Most recently available data reported 38% of special education students with a primary classification of autism were in their general education classroom for

80% of the day or more (USBE, 2015b). Students with a private medical diagnosis of autism who do not qualify for special education or related services in the public schools are not included in special education reporting by the state education agency. Within the State of Utah, Pinborough-Zimmerman et al. (2012, p. 525) found 20 to 50 percent of individuals with a diagnosis of autism did not receive special education services of any kind.

Parents of children with autism have identified a general need in the community at large to better understand the impairments and manifestations of autism (Bevan-Brown, 2010; Neeley-Barnes et al., 2011). The CDC estimated one in 68 children have autism (Baio, 2014; Christensen et al., 2012). Rates in the classification of autism for the purposes of providing special education services in public schools continue to rise (Brock, 2006; Finke et al., 2009; Gernsbacher et al., 2005; Higginson & Chatfield, 2012; Loiacono & Valenti, 2010; Moores-Abdool, 2010). General education teachers can approach their work in a way that designs instruction to meet the diverse group of learners in front of them at the time rather than making regular accommodations and modifications for students with specific or special needs (Jiménez et al., 2007).

Federal statute provides for the instruction of all students with disabilities in the least restrictive environment (IDEA, 2004). The Individuals with Disabilities Education Act (IDEA) exists to secure the right of a free and appropriate public education to students with disabilities of any nature. IDEA was first authorized in 1975 and has been revised regularly by Congress. IDEA (2004) requires all students receiving special education services in public schools be educated in the general education environment as much of the academic day as possible. Students receive specialized instruction outside of the general classroom environment in order to work toward their individual goals in a deficit area for a period of time as identified on their Individual Education Plan (IEP) (IDEA, 2004).

The benefits of including students with disabilities in the general education setting to the extent possible is validated by research. The advantages of inclusion for students who have disabilities, those who do not have disabilities, and the education professionals – special education teacher, general education teachers, and paraprofessionals – are well documented (Carter & Hughes, 2006; Cole et al., 2004; Downing & Peckham-Hardin, 2007; Foreman, Arthur-Kelly, Pascoe, & Smyth King, 2004; Harrower & Dunlap, 2001; Loiacono & Valenti, 2010). General education teachers are increasingly expected to be equipped with the techniques to meet the learning needs of these students (Loiacono & Valenti, 2010). Inclusive classroom practices require planning, organization, and preparation on the part of a general education teacher. Accommodating Diversity by Analyzing Practices of Teaching (ADAPT) is a practical framework which aligns the use of research-based instructional methods to specific phases of student learning to maximize acquisition of knowledge (Lee & Picanco, 2013). Through the ADAPT framework, teachers create an instructional environment encapsulating the principles of Universal Design for Learning and addresses the triad of impairments for students with autism.

One possible framework to improve access to the general education curriculum for all learners is Universal Design (CAST, 2015). Universal Design refers to a means to provide access to spaces regardless of a person's age or physical attributes (Browder, Wakeman, & Flowers, 2006). Providing access to public spaces for individuals with physical disabilities is now embedded in planning and building codes by municipalities through the implementation of the American's with Disabilities Act (ADA, 1990). Universal Design for Learning (UDL) was developed to provide access to curriculum and learning opportunities for all students (CAST, 2015). In the field of education and as a theoretical framework for this study, UDL guides educational planning in the areas of materials, instruction, and student responses (CAST, 2015). The Accommodating Diversity by Analyzing Practices of Teaching (ADAPT) framework

provides educators with a means to incorporate practices with which they are already familiar into an efficient and effective instructional routine for all students (Lee & Picanco, 2013). The ADAPT framework brings a level of practicality and efficiency to the theoretical framework of UDL (CAST, 2015; Lee & Picanco, 2013).

Research Questions

The objective of this study was to design and explore several vigorous research questions and add to the body of existing research (Creswell, 2014; Gall, Gall, & Borg, 2006; Marshall & Rossman, 2016). The data collected from general education practitioners may contribute to efforts to accurately estimate occurrence rates of autism, both diagnosed and undiagnosed in the general education classroom. Additionally, this investigation aimed to fill a gap in current research regarding the inclusion of students with autism by ascertaining the extent to which teachers are able to identify effective inclusive practices for students with autism, and the extent to which teachers utilize effective practices for students with autism within their classroom.

This research investigated multiple aspects of autism and the general education setting in the elementary school environment. Three distinct elements were examined: rates of autism in the general education setting, the extent to which general education teachers recognize inclusive practices specific to students with autism, and the extent to which general education teachers employ inclusive practices in their classroom. In order to better investigate each aspect, three primary research questions were posed:

1. In a general elementary education classroom, how does the rate of students with autism or multiple characteristics of autism compare to the state reporting rates of autism?

2. To what extent are general elementary education teachers able to identify the elements of an inclusive general education classroom that research has found to benefit students with autism?
3. To what extent do general elementary education teachers employ autism-specific teaching strategies?

Description of Terms and Phrases

Emerging technology and expanding research into all aspects of education require a clear interpretation of terminology. Technical, medical, and education-specific words and phrases are applied throughout this study. In addition, many expressions specific to autism are used. Not all terms have the same interpretation across all settings. Describing expressions and assigning a specific meaning to them adds clarity to the study (Creswell, 2014; Gall et al., 2006; Marshall & Rossman, 2011). This section defines the educational terms and phrases as they relate to the research literature of the study. When necessary, psychiatric or medical definitions associated with autism and the autism diagnosis are also provided.

504 Plan. A possible service option for individuals with disabilities in any setting receiving federal financial assistance. 504 Plans are administered under Section 504 of the Rehabilitation Act of 1973, which protects from discrimination based on disability (Utah Parent Center, 2011; USBE, 2015d). A 504 Plan provides accommodations or services to an individual whose mental or physical impairment substantially limits one or more of the individual's major life activities (Utah Parent Center, 2011; USBE, 2015d). The management and implementation of accommodations and/or services is the responsibility of the general education teacher, under the direction of the institution's 504 Coordinator (Utah Parent Center, 2011; USBE, 2015d).

Access to the general education curriculum. Providing students with disabilities access to the general curriculum involves the instructional support necessary to learn grade level curriculum at varying degrees of mastery (Browder et al., 2006).

Accommodation. An accommodation is a change in time, format, location, schedule, response or presentation that allows a student to undertake the same task as general education peers without altering the construct of the task (PACER Center, 2001).

Autism. Autism is a spectrum disorder that impairs an individual in the areas of communication, socialization, and interests or activities (APA, 2013; Goodman & Williams, 2007; Heflin & Alaimo, 2007; Huang & Wheeler, 2006; Polirstock & Houghteling, 2006; Safe et al., 2012; Safran, 2002; Volker, 2012). Autism is also referred to as Autism Spectrum Disorder (ASD). On the spectrum, Rhett's Disorder describes lower functioning individuals, and Asperger's Disorder describes higher functioning individuals (Davidson, 2015).

Construct. The curricular standard or objective being measured by a specific assignment or test (PACER, 2001).

Diagnosis of autism. A medical pronouncement made by a licensed medical professional using their professional knowledge and the criteria of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM). A medical diagnosis of autism is completed through a developmental screening and a comprehensive diagnostic evaluation by a developmental pediatrician, child neurologist, child psychologist, or psychiatrist (Centers for Disease Control and Prevention, 2015).

Differentiated instruction. The process of providing multiple learning opportunities in varying levels of difficulty, modality of expression or acquisition, and/or by including a variety of topics or student interests in the course of developing unit instruction (Ravitch, 2007).

Echolalia. The automatic repetition of sounds, words, phases, tone, or patterns of others (Autism Speaks, 2016).

Engagement. Time in which students are active participants in learning (Heflin & Alaimo, 2007).

Explicit instruction. A structured and systematic model for teaching academic skills that is distinguished by a series of supports utilized throughout the instruction process (Archer & Hughes, 2011).

Exposure to the general education curriculum. Exposure to the general education curriculum is provided when students with disabilities are in the general education classroom without the expectation of mastery of the grade level curriculum (Browder et al., 2006).

Expressive language. Expressive language is the act of conveying one's own thoughts, feelings, and ideas to others (Autism Speaks, 2016).

Executive functioning. The mental processes that enable one to plan, focus attention, retain and implement multi-step instructions, and attend to multiple tasks at one time (Harvard University, 2016).

Fidget. A fidget is a personal self-regulation tool implemented to help increase focus, attention, active listening, or address anxiety or sensory issues (Friendship Circle, 2016).

Formative assessment. Assessment given during the instructional phase intended to gauge the level of student comprehension and understanding of the material presented and is used to modify materials and support (Great Schools Partnership, 2016).

General education. The program of courses and instruction, based on state standards and evaluated by state assessment requirements, that typically developing students receive (Great Schools Partnership, 2016).

Identified with autism. Students who lack a medical diagnosis of autism may still be eligible for special education services under the reporting category of autism if the student meets the criteria as outlined in state-specific eligibility criteria.

Idiosyncratic. Idiosyncratic language or phrases refers to language that only makes sense to the private audience familiar with the situation where the language originated (Autism Speaks, 2016).

Inclusive general education classrooms. An inclusive educational environment is defined as one in which the reading and mathematics curriculum of students with disabilities is delivered alongside their peers in the general education classroom (Cole et al., 2004; Finke et al., 2009).

Intended Curriculum. A written description of the specific educational objectives students will know or be able to do as a result of completing a grade level or course (Great Schools Partnership, 2016).

Least restrictive environment. A student with a disability should be educated with non-disabled peers to the extent appropriate for both the student with special education services and the general education peers (Browder et al., 2006; DeMatthews & Mawhinney, 2013; IDEA, 2004).

Likert scale. A type of rating scale, usually with equal intervals between responses, designed to measure the attitudes, opinions, and values (Creswell, 2014).

Modification. A modification is a change to the task that alters the construct being measured (PACER Center, 2001).

Multiple means of representation. Content is presented in different ways (e.g., visual and auditory) to aid in perception, comprehension, and the transfer of learning (CAST, 2015).

Non-inclusive general education classrooms. A non-inclusive educational setting is one in which students with disabilities receive math and reading instruction at their ability level in a setting separate from the general education classroom and is provided by a special education teacher (Cole et al., 2004). This model is often referred to as a pull-out setting (Cole et al., 2004).

Outside support. See "related services".

Paraprofessional. An employee of the school or district who is not a licensed teacher but performs education related duties with students under the direct supervision of a licensed educator (U.S. Department of Education, 2016). Related terms include: para, paraeducator, instructional assistant, teacher aide, teacher/teaching assistant, classroom assistant.

Receptive language. Receptive language is the process of understanding the ideas and feelings of others (Autism Speaks, 2016).

Related services. Services a student needs in order to benefit from special education (Wright & Wright, 2016). Related services include, but are not limited to, audiology, interpretation, transportation, therapy, counseling and psychological services, and medical services (Wright & Wright, 2016).

Scaffolding. Instructional techniques used to enable students to attain comprehension and skills they would not otherwise be able to achieve on their own (Echevarria, Vogt, & Short, 2008; Great Schools Partnership, 2016).

Summative assessment. Assessment administered at the conclusion of an instructional period used to evaluate if students mastered the learning objectives (Great Schools Partnership, 2016).

Universal design for learning. Universal Design for Learning (UDL) is a framework for educational design that provides an appropriately challenging curriculum for all students by

using materials with a flexible format and utilize multiple representations of content (CAST, 2011; CAST, 2014; CAST, 2015; Hitchcock, Meyer, Rose, & Jackson, 2002).

Significance of the Study

Rising rates of autism imply general education teachers will increasingly interact with a higher percentage of students with autism (Brock, 2006; Finke et al., 2009; Gernsbacher et al., 2005; Higginson & Chatfield, 2012; Loiacono & Valenti, 2010; Moores-Abdool, 2010). The body of research covering the undiagnosed rates of autism implies teachers should be prepared to encounter students who exhibit multiple characteristics of autism, but do not have a diagnosis that might allow them access to a 504 plan, an IEP, or specific healthcare services (Russell et al., 2010). In order to facilitate delivery of the intended curriculum for all students in the classroom, general education teachers need to utilize research based classroom strategies and instructional design found beneficial to both students with autism and students with other or no disabilities (Finke et al., 2009; Loiacono & Valenti, 2010). The intended audience for this research investigation is educators, both special education and general education practitioners, and school administrators.

The objective of this research was to contribute to the body of literature and fill a research void pertaining to general education teachers using already defined effective instructional practices for students with autism (Creswell, 2014). First, the study provided a current assessment of the percentage of students in general education classes who are either diagnosed with autism or have multiple characteristics of autism but are not supported with special education services. Second, the study ascertained the extent to which teachers identify instructional practices effective for students with autism, and the degree to which they reported utilizing those instructional practices in the general education classroom. It is the researcher's intent that this data will assist teachers and administrators in reflecting upon current

instructional practice and make changes to better support a growing population of students with autism whose primary placement is in the general education classrooms. The research will also benefit pre-service teacher training by providing researched based instructional design and classroom strategies found beneficial to students with autism, students with other disabilities, and non-disabled students.

Overview of Research Methods

This mixed methods investigation sought to identify characteristics of students in general education classrooms, practices teachers identified as effective for use with students with autism, and the common practices teachers reported using. The research was grounded in the institution of general education classrooms in the elementary school setting and did not explore the phenomenon of autism. Mixed methods research amplifies the strengths of qualitative and quantitative data and are designed with one of the two methodologies -- quantitative or qualitative – to dominate the research (Creswell, 2014; Marshall & Rossman, 2016). This mixed methods research was an explanatory design, one in which the quantitative data was collected first, followed by qualitative data collection (Creswell, 2014). The data was collected through a cross-sectional survey developed by the researcher in which the quantitative items framed the research question for the participant and the qualitative items provided depth and understanding as it relates to current practice in the field (Creswell, 2014; Gall et al., 2006; Kalof, Dan, & Dietz, 2008; Kuada, 2012; Marshall & Rossman, 2016).

The survey was designed to collect data, at one point in time, as it related to current practice (Creswell, 2014; Gunter, 2002; Kalof et al., 2008). The data was collected through a self-report measure facilitated through Qualtrics. The self-report survey allowed the researcher to contact a large number of participants (Gall et al., 2006; Gunter, 2002; Kalof et al., 2008; Punch, 2003). The survey was designed by the researcher, and field tested prior to deployment

with the sample participants. The quantitative data collected the participant's educational information as it related to degrees, endorsements, and grade level assignment. Other quantitative data collected included self-report measures for the frequency of use of 12 specific instructional strategies, aggregated information about the students in the teacher's homeroom class, and a forced-choice selection of the instructional practices most closely aligned with benefitting students with autism. The qualitative elements of the survey included the opportunity to respond to four opened ended questions. Participants were asked what factors necessitated a special accommodation for a student in their classroom, how students with significant learning differences impact the efficient delivery of general education content standards, the ideal learning environment for students with significant learning differences, and about their skill set as it relates to having students with autism in their general education classroom.

Simple random sampling was selected to equally distribute bias (Creswell, 2014; Gunter, 2002). Two large suburban school districts in Utah were contacted for permission to conduct research in five schools in each district. The schools were selected for their similar size, socio-economic status, and student ethnicity. Each of the schools had a student body population of 700 to 800 students in grades kindergarten through six (USBE, 2017). The socioeconomic indicator for the participating schools ranges from 19% to 40% low income (USBE, 2017). The participating schools were 11% to 33% minority population (USBE, 2017).

Teachers were asked to identify the number of students assigned to their homeroom class, the number of students receiving special education services or services through a 504 Plan, and the number of students with a diagnosis of autism, but who did not qualify for or were not receiving special education services. After reporting these factual numbers, the respondent was presented with a list of observable characteristics generally found in students with autism and asked to report the number of students not served by special education or diagnosed with autism

but who exhibit multiple instances of the stated characteristics (Higginson & Chatfield, 2012; McKeon et al., 2013). Data collected from the self-report measure were compared with the data regarding the occurrence rates of students with autism for the State Education Agency (SEA). After answering the series of questions designed to focus on students with autism and students with significant learning differences, teachers were asked how such students impacted the efficient delivery of general education content standards and what would be the ideal educational environment for students with significant learning differences.

Utilizing research into effective instructional practices for students with autism, a list of specific practices was generated (Heflin & Alaimo, 2007; Higginson & Chatfield, 2012; McKeon et al., 2013). General education teachers were asked to report, on a five-point Likert scale, the extent to which a specific strategy was used in the classroom. The data collected from the Likert Scale with respect to the rate of use of autism-specific inclusion strategies was analyzed to determine if practices beneficial to students with autism were more prevalent than others in general education classrooms. Following the self-report, teachers were asked to describe conditions that result in going out of the normal classroom routine to make special accommodations for students and the measures they take to provide those accommodations.

Finally, respondents were given a set of strategies and asked to select the one believed provided the most support to students with autism. The questions were separated into the areas of social environment, physical environment, instructional materials, and instruction (Huang & Wheeler, 2006; McKeon et al., 2013). The data was analyzed in terms of overall frequencies of item selection as well as differences between groups to determine the degree to which general education teachers were aware of research-based inclusive practices effective with students with autism. Using the forced-choice items to narrow thinking to students with autism, teachers were

asked to respond to a question regarding their professional skill set for students with autism and how it was acquired.

Chapter II

The Literature Review

Introduction

After working with a group of parents who have children with autism, Bevan-Brown (2010) identified a need to teach the general community about the characteristics of students with autism in an effort to develop a better understanding and awareness of autism. Dymond, Gilson, and Myran (2007) surveyed and interviewed parents of children with autism to discover ways in which public services could better meet the needs of their children. With respect to the educational system, respondents identified the need for understanding that autism manifests differently in each child (Dymond et al., 2007). Additionally, parents reported the desire for teachers to acquire research-based skills in creating an educational environment and delivering instruction specific to students with autism (Dymond et al., 2007). Parents also requested school systems develop more appropriate educational programs and carefully consider the placement of children with autism in the educational setting (Bevan-Brown, 2010; Downing & Peckham-Hardin, 2007; Dymond et al., 2007; Iadarola et al., 2015; Lindsay, Ricketts, Peacey, Dockrell, & Charman, 2016).

It is important to understand the introduction and inclusion of the autism diagnosis as a part of the educational system and how general education teachers can best structure the classroom environment to meet the needs of learners with autism and integrate these students into the school community. This review of literature will examine six distinct areas of autism and the educational system:

1. The implementation of Universal Design for Learning (UDL) described by The Center for Applied Special Technology (CAST) as a theoretical framework for inclusive classroom practices (CAST, 2015);

2. The autism diagnosis and the educational system;
3. Rates of autism;
4. Characteristics of students with autism;
5. Inclusive practices specific to students with autism; and
6. Benefits of inclusive classroom practices.

Theoretical Framework: Universal Design for Learning and ADAPT

The theoretical framework links the research questions to the most current thought and practice of the field and is used to inform and stabilize the research conducted in the study (Jensen, 2002; Marshall & Rossman, 2016; Ravitch & Riggan, 2012). Policy issues and concerns relating to practice are noted as the theoretical framework of the study. Additionally, the framework exists to clarify why the investigation is important as well as how the research will inform and clarify the topic (Jensen; 2002; Kuada, 2012; Marshall & Rossman, 2016; Ravitch & Riggan, 2012). The policy issues tangential to this study are a student's right to a free and appropriate public education in the least restrictive environment (IDEA, 2004). The chief concern, as it relates to the general education teacher's practice, is how to best accommodate all learners within the pupil to teacher ratio of the general education setting (Brand, Favazza, & Dalton, 2012; Brusca-Vega, Alexander, & Kamin, 2014; Carter & Hughes, 2006; Hussin et al., 2008; Lindsay, Proulx, Thomson, & Scott, 2013; Rodriguez, Saldaña, & Moreno, 2012; Segall & Campbell, 2012). Universal Design for Learning (UDL) is a theoretical framework intended to provide the structure a teacher needs to deliver curriculum and instruction in an environment conducive for all types of learners across all settings (CAST, 2015; Brand et al., 2012; Denning & Moody, 2013; Edyburn, 2010; Heflin & Alimo, 2007; Hitchcock et al., 2002; Jiménez et al., 2007; McGhie-Richmond & Sung, 2013; McGuire, Scott, & Shaw, 2006). While differentiated instruction and UDL frameworks have much in common, the

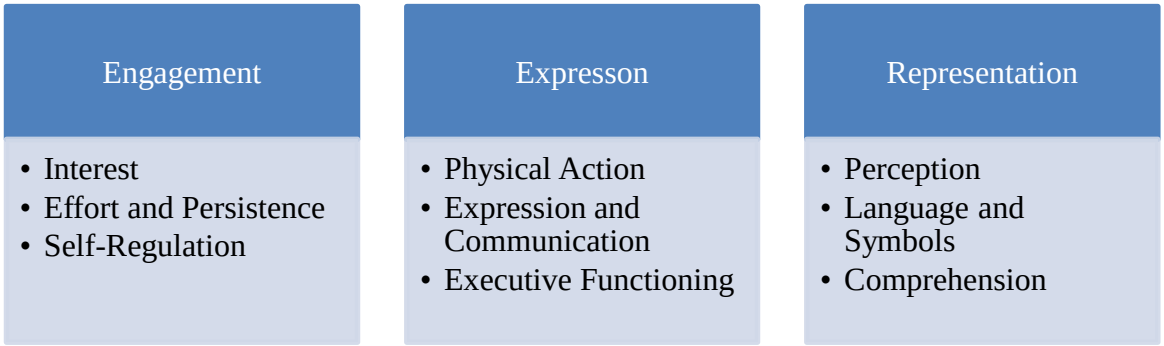
fundamental principles differ (CAST, 2013). Whereas differentiated instruction focuses on the teacher actions to make content accessible to all learners, UDL centers on designing curriculum to address neurological variability in learners (CAST, 2013). In essence, differentiated instruction requires the teacher to respond to individual student needs as they are presented; UDL emphasizes dynamic curriculum design prior to any students entering the classroom (CAST, 2013).

Roots of universal design. Emanating from the discipline of architecture, Universal Design refers to a means of providing access regardless of a person's age or physical attributes (Browder et al., 2006). In the field of education, UDL guides educational planning in the areas of materials, instruction, and student responses (CAST, 2015). The Center for Applied Special Technology (CAST) was founded in 1984, and was comprised of educational researchers who initially set out to examine how technology supports students with disabilities as they receive their education in the general education setting (CAST, 2015). Over time, CAST developed UDL as a means to provide access to the intended curriculum and learning opportunities in the general education setting for all learners (CAST, 2015). UDL is intended to serve as framework to accommodate curriculum acquisition in a manner accessible for all students (Brand et al., 2012; CAST, 2015; Denning & Moody, 2013; Edyburn, 2010; Heflin & Alimo, 2007; Hitchcock et al., 2002; Jiménez et al., 2007; McGhie-Richmond & Sung, 2013; McGuire et al., 2006).

Central tenets of UDL. In the general education setting, the teacher is responsible to deliver content knowledge to a variety of learners. In order to be as efficient as possible, a general education teacher may consider what it is students must know, be able to do, and how the teacher will know students understand. The guidelines for implementing UDL focus on these same areas and are referred to as: representation, action/expression, and engagement, (CAST, 2011; CAST, 2014). Figure 2 summarizes the key principles and components of UDL.

Figure 2

Guidelines for UDL



When a teacher provides multiple means of representation of the curriculum, students emerge from the instructional setting as more resourceful and knowledgeable learners (CAST, 2011; CAST, 2014). Multiple means of representation are provided when the instructor provides opportunities for interaction with the content students are expected to learn in a way that is both auditory and visual (Brand et al., 2012; CAST, 2011; CAST, 2014; Hitchcock et al., 2002). Planning for multiple means of representation also includes clarification of vocabulary, symbols, and other important nuances of the content (Brand et al., 2012; CAST, 2011; CAST, 2014). In order to facilitate comprehension of the educational content, multiple means of representation also requires the educational planner to include background knowledge, big ideas, and facilitate the generalization of the curriculum (CAST, 2011; CAST, 2014; Hitchcock et al., 2002). In their research into effective practices for students with autism, Goodman and Williams (2007) suggest providing student-size replicas of information boards used by the whole class, and specifying the important information. Multiple means of representation help to produce learners who are strategic and goal directed (CAST, 2011; CAST, 2014). A teacher allows for multiple means of representation when he or she provides physical action as a consideration and would allow for a

variety of student response methods, or incorporate available assistive technology as appropriate (CAST, 2011; CAST, 2014; Mintz, 2013; Strobel, Arthanat, Stephen, & Flagg, 2007).

Expression and communication are addressed when educators allow for students to construct, compose, and communicate in multiple ways and provide students with opportunities to interact with multiple forms of media (CAST, 2011; CAST, 2014; Griffin, League, Griffin, & Bae, 2013; Hitchcock et al., 2002). Scaffolding the curriculum information and classroom expectations are another way to address expression and communication (Brand et al., 2012; CAST, 2011; CAST, 2014; Echevarria et al., 2008). Finally, educators can facilitate executive functioning by helping students to set goals, manage large amounts of information, and monitor completion of long-term or on-going projects (CAST, 2011; CAST, 2014; McKeon et al., 2013).

Multiple means of promoting student engagement fosters a more purposeful and motivated learner (CAST, 2011; CAST, 2014). Educators can promote student interest by providing choice when possible, providing relevance and context, and creating a safe and inviting learning environment (CAST, 2011; CAST, 2014). Safran (2002) suggests teachers who have students with high functioning autism in their general education classroom should capitalize on the student's special interests. Parents interviewed by Bevan-Brown (2010) suggested teachers of students with autism play to the strengths of the student in the classroom in order to maintain the academic attention of the student and reduce negative peer attention directed toward the student with autism. Using the UDL guidelines, educators can promote an environment in which all students persist through academic tasks and challenges by varying demands, fostering collaboration, and providing specific feedback (Brand et al., 2012; CAST, 2011; CAST, 2014; Dymond et al., 2007; Edyburn, 2010). Educators can promote self-regulation in all students by facilitating coping skills and helping students self-assess and regulate (CAST, 2011; CAST, 2014). Self-regulation, in turn, will help students with autism behave in a manner that mimics

their peers. Bevan-Brown (2010) reported the importance of educators teaching students with autism to take socially acceptable breaks from academic tasks.

Parents identified the need for educators to understand autism manifests differently in each child, and suggested teachers need to incorporate instructional methodologies grounded in inclusion research which are effective when implemented with students with autism (Bevan-Brown, 2010; Downing, Peckham-Hardin, 2007; Dymond et al., 2007). The variety of methodology is embedded in UDL and meets the needs of all learners as a theoretical framework for designing the educational environment. Much of the literature examined regarding the principles and application describe UDL as an approach to education in which teachers design instruction based on the diverse group of learners in front of them at the time, rather than making regular adjustments for students with specific or special needs (Jiménez et al., 2007; McGuire et al., 2006).

Edyburn (2010) makes the comparison of UDL implementation to cooperative learning or co-teaching. Just as cooperative learning is not simply two students talking to each other in a classroom, Edyburn (2010) asserts educators must be able to innately define UDL in the same way we understand and are able to define cooperative learning. For UDL to function as a framework for all learners, it cannot be reduced to the phrase “it’s just good teaching”, because the phrase marginalizes students with disabilities (Edyburn, 2010). Rather, UDL must be seen as a 21st century approach to education knowing it has been designed with the benefit of brain imaging, learning sciences, instructional design, and access to technology that addresses the full range of ability found in a general education classroom (Edyburn, 2010; Jiménez et al., 2007; McGuire et al., 2006). The Accommodating Diversity by Analyzing Practices of Teaching (ADAPT) framework provides educators with a means to incorporate practices with which they

are already familiar into an efficient and effective instructional routine for all students (Lee & Picanco, 2013).

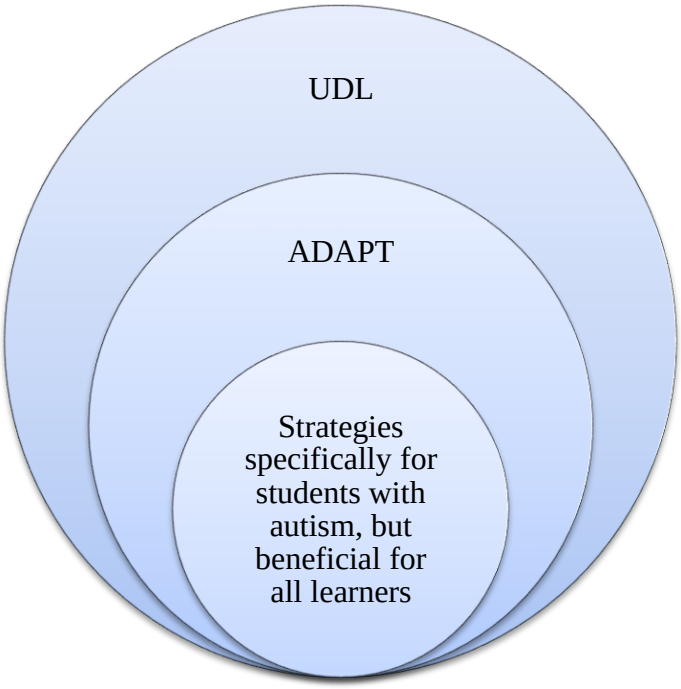
Relationship between UDL and ADAPT. UDL provides the context for designing the instruction and assessment to reach all learners, and ADAPT specifically addresses the construct of instruction in the general education curriculum (CAST, 2015; Lee & Picanco, 2013). ADAPT functions as a framework to facilitate the examination of research-based teaching practices for use at the proper time in the learning sequence. Lee and Picanco (2013) distinguish between "stages of learning" and "phases of learning", and their framework focuses on phases of learning. The distinction lies in developmental stages (i.e., stages of learning) as opposed to the actions and processes a learner undergoes in the process of mastering new information (Lee & Picanco, 2013). The phases of learning are categorized into acquisition, proficiency, maintenance, and generalization (Lee & Picanco, 2013). Lee and Picanco (2013) apply the ADAPT framework to Differentiated Instruction, UDL, and the co-teaching model. Lee and Picanco (2013) assert the selection of the proper instructional technique for the proper phase in student learning will result in a more efficient path to mastery and reduce cognitive dissonance associated with applying the wrong strategy for the phase of learning.

Teachers can address UDL's principle regarding multiple means of representation with ADAPT by using direct instruction in the acquisition phase of learning, while allowing students to read about the topic or view the topic (CAST, 2015; Lee & Picanco, 2013). Teachers can address UDL's multiple means of action/expression by aligning the formative and summative assessment to the learning phase (CAST, 2015; Lee & Picanco, 2013). By starting with UDL and allowing students to express their understanding in a variety of ways, the teacher can also ask the student to respond to items of greater difficulty as the phases of learning progresses (CAST, 2015; Lee & Picanco, 2013). Finally, UDL recommends multiple means of engagement

(CAST, 2015). By aligning the learning tasks and reinforcing activities available to the student with the phases of learning, student interest is maintained and maximum engagement is achieved as the student interacts appropriately with the content (Lee & Picanco, 2013). Figure 3 depicts the conjunction of UDL and ADAPT to form the theoretical framework of this study.

Figure 3

The Theoretical Framework



Addressing the triad of impairments. Broadly, students with autism present with a triad of impairments across the spectrum which impact the person's social interaction, language, and behavior (Able, Sreckovic, Schultz, Garwood, & Sherman, 2015; Davidson, 2015; Heflin & Alaimo, 2007; Safe et al., 2012). A general education teacher wishing to create a classroom environment accessible to all students, including those with autism, would first employ UDL and provide students with multiple means of engagement, expression, and representation (CAST, 2015). Then, to bring efficiency to the learning process, the teacher would align the instructional

method with the current phase of student learning (Lee & Picanco, 2013). To address the lack of social interaction in the triad of impairments, a general education teacher would explicitly teach and rehearse the specific social skills required of students in each instructional method (Able et al., 2015). A teacher would address the language impairment by allowing for audio, visual, or experiential learning through all phases of content acquisition (CAST, 2015; Lee & Picanco, 2013). Finally, the teacher would have specific classroom procedures and consequences that are taught and followed to fidelity to address the behavior impairment (Crosland & Dunlap, 2012; Denning & Moody, 2013; Jones & Frederickson, 2010; Lindsay et al., 2013).

Autism Diagnosis and the Educational System

Leo Kanner ascribed the term "autism" to an array of marked differences in social interaction, communication, and an individual's focused interest on limited topics in the 1940s (Gernsbacher et al., 2005). It was not until 1980 that autism was added to the *Diagnostic and Statistical Manual of Mental Disorders* (DSM) III by the American Psychiatric Association (APA) (1980). In 1980, the DSM III required a person meet six of six identifying criteria for a diagnosis of autism (APA, 1980; Gernsbacher et al., 2005). By 1994, the DSM IV published the first revision to the diagnostic criteria for autism (APA, 1994). In the DSM IV, there are 16 optional criteria, and an individual must meet half of those for a diagnosis of autism (APA, 1994; Gernsbacher et al., 2005). Further, the DSM IV expanded the diagnostic categories from two to five (APA, 1994). Asperger's Disorder and Pervasive Developmental Disorder Not Otherwise Specified (PPDNOS) were considered milder forms of autism but identified under a separate diagnosis (APA, 1994). These two disorders required the subject meet two-thirds of the requirements for autism (Gernsbacher et al., 2005).

In 2013, the APA released the DSM V. The DSM V (APA, 2013) published significant revisions to the criteria for a diagnosis of autism. Under the DSM V (APA, 2013) previously

separate disorders, such as Asperger's Disorder and PPDNOS, were integrated into the broad category of autism and no longer diagnosed separately. The domains of characteristics were reduced from three, social impairment, language or communication impairment and repetitive or restricted behavior, to two (APA, 2013). The first domain of diagnostic criteria is now in the area of impairment in social communication, and the second is in the area of restrictive interests or repetitive behaviors (APA, 2013). In addition to one broad category of autism which encompassed the milder forms of autism as well, the DSM V (APA, 2013) added Social (Pragmatic) Communication Disorder as a related diagnosis. Social (Pragmatic) Communication Disorder is characterized by pervasive deficiencies in verbal and nonverbal communication concurrently (APA, 2013). The effect of these deficits in communication limits an individual's ability to participate in receptive and expressive communication, have developmentally appropriate social interactions and relationships, and impedes both academic achievement and subsequent occupational performance (APA, 2013).

IDEA (2004) defines the categories under which a student may be eligible for special education services. The terms used to define the disability of a child, ages three through 21 are: (1) autism, (2) deaf-blindness, (3) deafness, (4) emotional disturbance, (5) hearing impairment, (6) intellectual disability/mental retardation, (7) multiple disabilities, (8) orthopedic impairment, (9) other health impaired, (10) specific learning disability, (11) speech or language impairment, (12) traumatic brain injury, and (13) visual impairment (IDEA, 2004). IDEA does allow each state flexibility in the interpretation of some rules (Rosen, 2016; The Children's Hospital of Philadelphia, 2016). For example, "developmental delay" is not one of the IDEA eligibility categories. IDEA provides minimum standards for the definition and eligibility criteria, but states are given flexibility to include it as a classification category, the definition of the classification, and the age range to which the classification applies (IDEA, 2004; Learning

Disabilities Association of America, 2016; National Dissemination Center for Children with Disabilities, 2012; Rosen, 2016).

States are also allowed flexibility to determine how a student qualifies for special education services under one of the 13 categories (Rosen, 2016). Three common methods, all allowed in the flexibility granted under IDEA, for qualification under the category of specific learning disability are (1) the discrepancy model, (2) Response to Intervention (RtI), and Pattern of Strengths and Weaknesses (PSW) (IDEA, 2004). A student may qualify for special education under specific learning disability by displaying a discrepancy in their actual performance when compared to their performance on a test of general intelligence (USBE, 2016a). This is known as the discrepancy model. The second way in which a student may be eligible for special education under the category of specific learning disability is by analyzing the student's response to specific interventions, or Response to Intervention (RtI). RtI does not require standardized testing (USBE, 2016a). Rather, the general education teacher identifies the area of deficiency, provides a research-based intervention on a consistent schedule and measures the student's progress in comparison to other students with the same deficiency (USBE, 2016a). A student not making appropriate progress would qualify for special education under RtI (USBE, 2016a). Teams are also allowed to use a combination of the discrepancy method and RtI to determine a student's eligibility for special education services under the category of specific learning disability (USBE, 2016a). PSW combines information from standardized testing with classroom intervention and assessment data to determine the area in which a student may have a specific learning disability (U.S. Department of Education, 2006).

The category of autism is not immune from flexibility in the eligibility criteria for classification. First, it is important to note a medical diagnosis of autism does not automatically qualify a student for special education services (The Children's Hospital of Philadelphia, 2016).

In order to qualify for special education services, a student must have a disability and be in educational need of special education services (Learning Disabilities Association of America, 2016; The Children's Hospital of Philadelphia, 2016). Additionally, a medical diagnosis of autism is not required under IDEA for the classification of autism (IDEA, 2004). States have the flexibility to write eligibility criteria matching diagnostic criteria measured through observation and standardized testing to make an educational decision for a special education classification of autism. If a student does not meet the two-pronged eligibility requirements for special education services, a student with autism would still be eligible for accommodations under a 504 Plan if the effects of autism substantially limits one or more of the student's major life activities, has a record of having the impairment, or is regarded as having an impairment (Americans with Disabilities Act of 1990; Utah Parent Center, 2011; USBE, 2015d).

Autism was included as a special education eligibility category in 1991 (Brock, 2006). Noting educators primarily identify rates of students with autism by the percentage of special education students in the reporting category, Goodman and Williams (2007) suggest the actual rate at which general education practitioners encounter students with autism is higher than the reported rate of autism in general population statistics. In Utah, where this research was conducted, the criteria for eligibility in special education under the classification of autism (USBE, 2016a) is similar to the diagnostic criteria in the DSM IV (APA, 1994) but does not require a medical diagnosis. The special education team consisting of a team of qualified education professionals and the parents of a student must agree the student meets the definition of autism and all eligibility as stated by the SEA classification rules (USBE, 2016a). Even if the student meets the stated definition of autism, a student would not be eligible for special education services if the autism does not adversely affect the educational performance of the student

(USBE, 2016a). Thus, many students have a diagnosis of autism but do not receive special education or related services.

Under Utah eligibility criteria, autism must be the student's primary disability. A student would not be classified in the eligibility category of autism if the student has an emotional disturbance or an intellectual disability (USBE, 2016a). In order to be classified in the category of autism for special education purposes, the student must require both special education and related services (USBE, 2016a). Additional characteristics for a student to be eligible for the special education classification of autism must include a significant impairment in both verbal and non-verbal social interaction and communication (USBE, 2016a). The special education team may also include the following factors when considering a special education classification under the category of autism: repetitive activities, stereotyped movements, difficulty with change, difficulty in self-regulation of emotions, and an unusual response to sensory input (USBE, 2016a).

Rates of Autism in the United States

Extensive research has been conducted investigating the rates of autism in the United States to determine if the rise in the reported rate is a function of reclassification into appropriate special education categories, increased public awareness, diet, vaccinations, less restrictive diagnostic criteria, or an increase in the tendency to co-diagnose conditions (Brock, 2006; Finke et al., 2009; Gernsbacher et al., 2005; Higginson & Chatfield, 2012; Loiacono & Valenti, 2010; Moores-Abdool, 2010). For classroom teachers, the explanation for the rising rate of autism is not as important as the rate itself. General education practitioners will, undoubtedly encounter students with autism in their classrooms and be expected to provide students with autism a free and appropriate public education in the least restrictive environment (IDEA, 2004). Nonetheless, it is expected the reporting of autism rates will continue to rise until such time as the individual

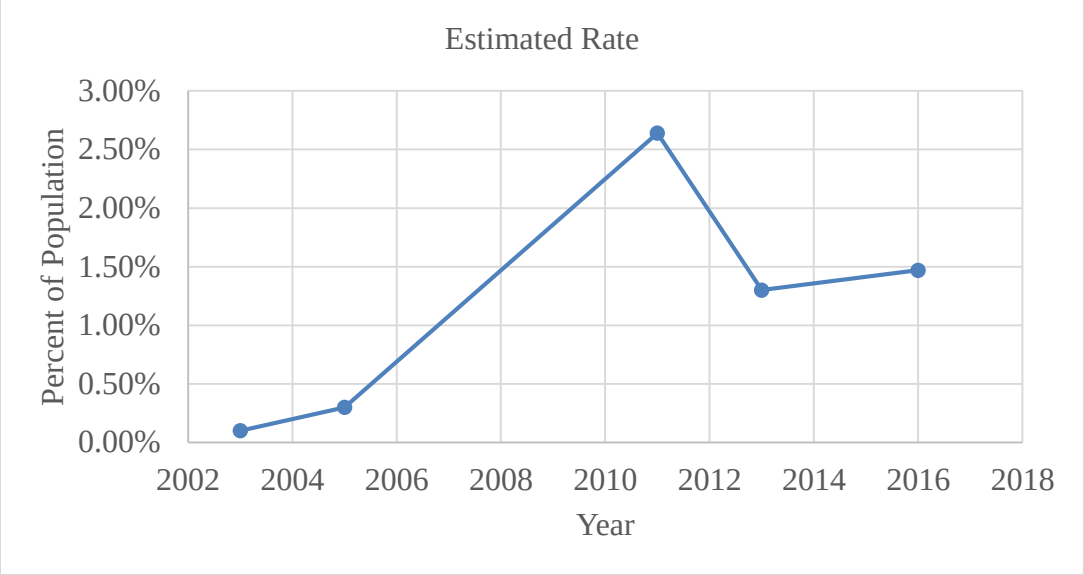
state reporting of students with autism matches the expected results of large scale epidemiological studies (Gernsbacher et al., 2005; Tidmarsh & Volkmar, 2003).

The results of large scale epidemiological studies to predict an occurrence rate of autism vary dramatically (Gernsbacher et al., 2005; Kim et al., 2011; Tidmarsh & Volkmar, 2003). In 2003, attempts to estimate the occurrence rate of autism ranged from one-quarter up to three possible occurrences of autism for every 1,000 individuals with a best estimate of one person with autism in every 1,000 individuals (0.1%). (Tidmarsh & Volkmar, 2003). When combining all Pervasive Developmental Disorders (PPDs) to examine the rates of autism as a spectrum disorder, the conservative estimate in 2003 was three individuals with autism in every 1,000 people (0.3%) (Tidmarsh and Volkmar, 2003). Just two years later, researchers predicted autism occurs in approximately six of every 1,000 individuals (0.6%) (Gernsbacher et al., 2005).

More recent attempts to estimate occurrence rates of autism are much higher (Kim et al., 2011; Pinborough-Zimmerman et al., 2012). The highest estimated occurrence rate of autism was 2.64% or 26 individuals in every 1,000 (Kim et al., 2011). Other research approximates one child with autism in every 77 in the population for children ages six to eight, or 1.3% (Pinborough-Zimmerman et al., 2012). Data from the Centers for Disease Control and Prevention (CDC) report one in every 68 children (1.47%) have been diagnosed with autism (Baio, 2014; Christensen et al., 2012). The CDC estimate of 1.47% is considered to be the current, accepted estimate of the autism occurrence rate in the United States. Figure 4 displays the estimated occurrence rates of autism over time.

Figure 4

Estimated Occurrence Rate of Autism



The approximate prevalence rates of autism displayed in Figure 4 were generated using available data regarding medical diagnoses of autism. The National Institute of Health (NIH) regularly surveys adults about family health conditions. The survey has over 10,000 participants, and in each family, detailed questions are asked about one randomly selected child (Zablotsky, Black, Maenner, Schieve, & Blumberg, 2015). From 2011 through 2013, the NIH prevalence rate for autism was consistently reported at 1 in 80 children (Zablotsky et al., 2015). This represents a rate of autism of 1.25% in school-age children. In the 2014 survey, the order of questions was changed as well as the wording of other items, and researchers extrapolated one in 45 children (2.22%), ages three to 17, may fall on the autism spectrum (Zablotsky et al., 2015). This estimate is similar to another survey of parents conducted in 2013. The National Survey of Children's Health found the autism occurrence rate to be one in 50 children (Blumberg et al., 2013). Because this data is derived from parent surveys, these numbers will not replace the

current CDC rate of one in 68 as the official estimate of autism prevalence in the United States Blumberg et al., 2013).

Outside of special education classifications, there are three possible reasons for the rise in the number of individuals diagnosed with autism since 1992: (a) the diagnostic criteria for autism has broadened as it has been refined; (b) the public has become more aware of autism and its presentation across a spectrum of impairments; and, (c) there has been a legitimate increase in case findings of students with autism (Gernsbacher et al., 2005). Discussions of the changing rates of autism rarely account for changes in diagnostic criteria during the period of the study (Tidmarsh & Volkmar, 2003). If educators primarily identify rates of students with autism by the percentage of special education students in the reporting category, the actual rate at which general education practitioners encounter students with autism is higher than the reported rate (Goodman & Williams, 2007).

It is likely there are a high number of children who are on the autism spectrum and never identified by a health care provider or the educational system as a child with autism (Russell et al., 2010). In comparing behavioral traits of undiagnosed children from the general population with behavioral traits of students with an autism diagnosis, studies have found between 55% and 66% of the subjects from the undiagnosed population had autism-like characteristics at the same rate of those who had been diagnosed with autism or were receiving educational support for a diagnosis of autism (Kim et al, 2011; Russell et al., 2010).

In addition to undiagnosed rates of autism, general education teachers encounter students who have a diagnosis of autism but do not qualify for special education services in the educational setting (Finke et al., 2009; Loiacono & Valenti, 2010; Moores-Abdool, 2010; Pinborough-Zimmerman et al., 2012). In a longitudinal study conducted in conjunction with the Utah State Health Department and the Utah State Board of Education, Pinborough-Zimmerman

et al. (2012) approximated between 20% and 50% of the individuals in the data set having a diagnosis of autism did not receive private or public special education services of any kind (p. 525).

Prior to 1991, students with autism were likely classified as Emotional Disturbance (ED), Mental Retardation (MR), Specific Learning Disability (SLD), or Speech/Language Impaired (SLI) (Brock, 2006). Since 1991, the autism classification rate has increased and the combined rate for ED, MR, SLD, and SLI has declined (Brock, 2006). Like autism, the rate of classification of Other Health Impairments (OHI) has also increased (Brock, 2006). There was a significant correlation between the increase in the selection of the autism classification and a corresponding decrease in the assignment of a MR classification rates (Brock, 2006). The same held true for the comparison between autism and ED classifications, but there was not a statistically significant correlation in the comparison of rates between autism classification and SLI classifications (Brock, 2006). Heightened public awareness, increased diagnosis, and availability of resources for individuals with autism are all possible causes of the increased rate in autism classifications (Brock, 2006; Finke et al., 2009; Gernsbacher et al., 2005; Higginson & Chatfield, 2012; Loiacono & Valenti, 2010; Moores-Abdool, 2010).

The implications of this data are significant for public education. With increasing numbers of children with autism, general education teachers are required to provide educational environments for this specific set of students (Higginson & Chatfield, 2012). Rather than referring children with autism or autism-like characteristics for special education services, general educators should increase their knowledge and classroom practice with respect to inclusive classroom strategies that buttress the acquisition of the content for children with autism (Finke et al., 2009; Higginson & Chatfield, 2012). Additionally, Higginson and Chatfield (2012) identify a one-year delay from the time parents first seek medical diagnosis for autism and the

delivery of the diagnosis. In the meantime, general education teachers will have this student in the classroom. If autism does not adversely affect the educational performance of the student, the student may not qualify for special education services (USBE, 2016a).

General education teachers can promote the success of students who have a medical diagnosis of autism or who exhibit multiple characteristics of autism by incorporating inclusive classroom practices into their teaching environment (Edyburn, 2010; Jiménez et al., 2007; McGuire et al., 2006). In the examination of theories behind the rising rates of autism, Waterhouse (2008) concluded researchers should view autism as a collection of independent disorders in the areas of impaired social function and social cognition, impaired communication, diminished motor skills and diminished cognitive skills. By focusing on common characteristics in the manifestation of autism, educators can work to more efficiently meet the education deficits and proclivities of students with autism or characteristics of autism (Waterhouse, 2008).

Characteristics of Students with Autism

McKeon, Alpern, and Zager (2013) used a survey designed to elicit the perception of college professors of students with disabilities to identify key challenging behaviors manifested by students with autism. Using a check-list of behaviors, the respondents identified executive functioning and language or communication as the two most frequently occurring challenging classroom behaviors in students with autism (McKeon et al., 2013). In the survey (McKeon et al., 2013) behaviors associated with executive functioning were distractibility, disorganization, lack of time management, lack of impulse control, and unusual nonverbal behaviors. Behaviors associated with communication were difficulty asking or answering questions, providing information off topic, and difficulty understanding complex information (McKeon et al., 2013).

Behaviors considered in a medical diagnosis of autism are grounded in communication deficits, behavior, and interest patterns that might be restricted or repetitive (APA, 2013). The

criteria for special education eligibility under the category of autism include, but are not limited to, behaviors negatively affecting verbal communication, nonverbal communication, social interaction, and behaviors repetitive in nature (U.S. Department of Education, 2004; USBE, 2016a). Special education eligibility criteria for autism also considers stereotyped movements, and difficulty adjusting to changes (U.S. Department of Education, 2004; USBE, 2016a). For the purposes of this study, observable characteristics of children are important. The literature review focuses on characteristics associated with social interaction, language, and behavior.

Impairment to social interaction. Students who meet the special education eligibility criteria for autism generally do not use appropriate nonverbal behaviors and may not make eye contact when speaking or use facial expressions and body language to convey or interpret language (USBE, 2016a). Additionally, these students fail to engage in developmentally appropriate peer relationships or spontaneously initiate social interaction (USBE, 2016a). Examples of social impairments students with autism may exhibit are also provided by the DSM V (APA, 2013). Students with autism may adopt an abnormal social approach or are unable to participate in a back-and-forth conversation with another individual (APA, 2013). Students with autism may also display difficulty in adjusting his or her behavior to suit the social context as well as difficulty in participating in imaginative play (APA, 2013). Bevan-Brown (2010) interviewed parents of students with autism to ascertain key aspects about the disorder parents identified as important to share with the general community, the educational system, peers, and service providers. The study identified the use of social skill instruction as a way to create a successful peer environment for students with autism (Bevan-Brown, 2010).

Impairment in language. In addition to the difficulties in communication manifesting in social interactions presented above, students with autism may also present a delay in spoken language, without an attempt to use an alternate means to communicate their needs or wants

(USBE, 2016a). Other communication impairments which may be observed in students with autism are the repetitive use of a word or phrase, or peculiar language patterns (USBE, 2016a). In Utah where this research was conducted, the eligibility category of autism in the SEA Rules mandate a student require both special education services and at least one related service (USBE, 2016a). In the case of impairment in communication, the related services would be provided by the school's speech language pathologist. In the DSM V, communication impairment not social or pragmatic in nature is found under restricted, repetitive behaviors (APA, 2013). Under the diagnostic criteria of autism, students may exhibit stereotyped or repetitive speech such as echolalia or idiosyncratic phrases (APA, 2013).

Impairment in behavior. Parents interviewed by Bevan-Brown (2010) suggested educators get to know a student with autism and use those elements of preoccupation to teach to the student's strengths in the classroom to maintain their academic attention and reduce negative peer attention. Students who are classified under the special education category of autism may also exhibit restricted patterns of movement not ordinarily found in individuals and are considered atypical because of their specific intensity or focus, or have a rigid devotion to specific rituals or routines without a function or purpose for the situation (Goodman & Williams, 2007; Heflin & Alaimo, 2007; USBE, 2016a). Students with autism may also demonstrate persistent preoccupation with people, events, or objects (Goodman & Williams, 2007; Heflin & Alaimo, 2007; USBE, 2016a). For example, one might see a student with autism line up toys or flip objects (APA, 2013). In some instances, these restrictive, repetitive behaviors may manifest as a resistance to change in environment or routine.

With varying degrees of severity, students with autism may exhibit an abnormally rigid adherence to schedule, routine or pattern (APA, 2013). Some of the ways in which this may manifest include: disproportional distress to a small change; difficulty with transitions; the need

to take same route to a particular location; or, the desire to eat the same food every day (APA, 2013). Educational practices presenting as particularly challenging for students with autism include the introduction of a new student to the class, a substitute teacher, any unexpected adult in the classroom, a change in seating assignment or furniture arrangement, or a change in daily schedule (Goodman & Williams, 2007; Heflin & Alaimo, 2007; USBE, 2016a). Parents of students with autism identify a regular schedule and advance warnings any time the class will deviate from the schedule as important for students with autism (Bevan-Brown, 2010; Heflin & Alaimo, 2007).

An additional element of both special education eligibility criteria for autism and a medical diagnosis of autism is a heightened or unusual response to sensory input or stimuli (APA, 2013; Goodman & Williams, 2007; Heflin & Alaimo, 2007; USBE, 2016a). Students with autism may exhibit unusual or extreme responses to sounds, textures, tastes, scents, lights, or movement (APA, 2013; Goodman & Williams, 2007; Heflin & Alaimo, 2007; USBE, 2016a). Some students with autism may also present with an indifference to pain or temperature (APA, 2013). It is possible for a student with autism to exhibit extreme reactions to sensory input or curious interests in sensory input from their current surroundings (APA, 2013; Heflin & Alaimo, 2007). Parents and college professors alike recommend educators take sensory issues into consideration when assigning a seat to a student with autism (Bevan-Brown, 2010; McKeon et al., 2013). A specific noise in the classroom, the odor of a classmate, or even the light from the windows may provoke an unexpected response from a student with autism (Bevan-Brown, 2010; Heflin & Alaimo, 2007; McKeon et al., 2013).

Inclusive Classroom Practices Specific to Students with Autism

Many students with autism receive their instruction exclusively in the general education setting without the support of special education or related services (Goodman and Williams,

2007). Inclusive practices can be categorized into four areas in the general education classroom environment and instructional setting: social environment; physical environment; instruction; and, instructional materials (Goodman & Williams, 2007; Huang & Wheeler, 2006; McKeon et al., 2013, Soukup, Wehmeyer, Bashinksi, & Bovaird, 2007). Additionally, parents of students with autism have suggested ways in which schools can successfully include a student with autism in the general education curriculum (Bevan-Brown, 2010; Goodman & Williams, 2007). In classrooms where inclusionary practices for students with autism are already employed, multicomponent interventions are more prevalent in general education classrooms than single intervention strategies (Harrower and Dunlap, 2001). The multicomponent interventions consist of either multiple social interventions or multiple academic interventions (Harrower & Dunlap, 2001).

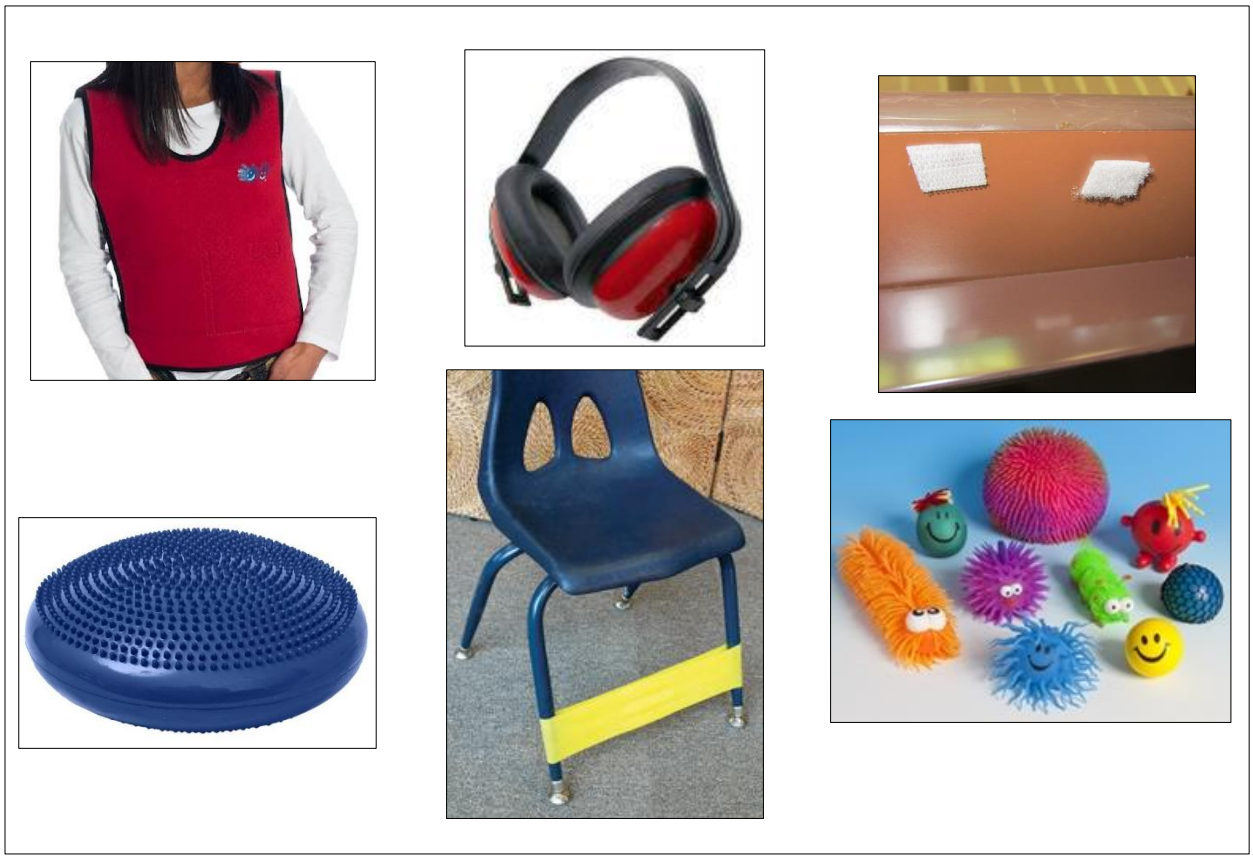
Inclusive social environments in the general education setting. The literature identifies the importance of explicit instruction of social skills to students with autism (Bevan-Brown, 2010; Goodman & Williams, 2007; Huang & Wheeler, 2006; McKeon et al., 2013). When asked, parents provided the majority of their feedback pertaining to how educators can best help students with autism in the area of creating an appropriate social environment (Bevan-Brown, 2010). Parents emphasized the importance of social skills instruction, teaching students to take socially acceptable academic breaks, and proactively addressing unstructured settings (Bevan-Brown, 2010). In addition to specific social skills instruction, there are practices the general education teacher can incorporate which facilitate academic success for students with autism. In the general education setting, Goodman and Williams (2007) identify inclusive social practices as those which require a student with autism to respond to academic and social prompts, encourage a student to make choices, and facilitate friendships. These social skills are necessary for successful participation in college and careers. At the collegiate level, McKeon et

al. (2013) identify the promotion of collaboration among students as a necessity to an inclusive general education setting. The specific instruction of all students in social skills is a prerequisite for a teacher who wishes to include peer tutoring or cooperative learning as the student progresses through the phases of learning (Able et al., 2015; Bevan-Brown, 2010; Laushey, Heflin, Shippen, Alberto, & Fredrick, 2009; Lee & Picanco, 2013; Teunisse, Cools, van Spaendonck, Aerts, & Berger, 2001).

Inclusive physical environments in the general education setting. In terms of the physical environment, parents identified preferential seating, a regular schedule, and advance warning of schedule changes as being important to the success of their student with autism (Bevan-Brown, 2010). Predictable daily routines and visual schedules were identified by academic researchers as paramount to the success of a student being on-task and to promote academic independence of students with autism (Goodman & Williams, 2007; Heflin & Alaimo, 2007; Huang & Wheeler, 2006; McKeon et al., 2013; Soukup et al. 2007). Distractions should also be reduced as much as possible in the physical classroom environment of students with autism (Huang & Wheeler, 2006; McKeon et al., 2013). Distractions to consider can be everything from environmental noises (loud fans, buzzing lights, or noisy classmates) to academic support materials on the classroom walls. Every effort should be made to organize the materials in the classroom so they are useful and informative, but not distracting (McKeon et al., 2013). The final aspect of physical environment the general education teacher should consider is the student with autism. The student may require the use of a sensory device such as a fidget or weighted vest to incorporate appropriate movement and sensory processing into their physical environment (Goodman & Williams, 2007). Figure 5 depicts common sensory tools appropriate to the educational setting.

Figure 5

Examples of Sensory Tools



The sensory tool examples shown in Figure 5 are: (top row, left to right) weighted vest; noise cancelling headphones; hook and loop pieces attached to the underside of a desk; (bottom row, left to right) chair cushion; chair band; and, fidget tools. In the examples listed here, the hook and loop, chair cushion, chair band, and fidget tools can serve as an intervention tool for students with attention difficulties. Creating an environment in which the student can focus on the academic task at hand provides students with autism the critical foundation necessary for engagement in the content (CAST, 2015).

Inclusive instructional practices in the general education setting. Parents suggested teachers should get to know each student with autism in order to capitalize on the student's

strengths in the classroom, which will help maintain the student's academic attention and reduce negative peer attention (Bevan-Brown, 2010). McKeon et al. (2013) also identify sandwiching the lesson between a preview statement and a review statement. By aligning the learning tasks and reinforcing activities available to the student with the phases of learning, student interest is maintained and maximum engagement is achieved as the student interacts appropriately with the content (CAST, 2015; Lee & Picanco, 2013). This is one example of providing multiple means of engagement as directed by UDL (CAST, 2015).

Inclusive preparation and use of instructional materials in the general education setting. Instructional materials should not be complex or text dependent and large tasks should be broken down into the smaller components for students with autism (Huang & Wheeler, 2006; McKeon et al., 2013). Often a teacher will refer to a class-size model hung in the room such as the hundreds chart, calendar, number line, alphabet, or times table chart. Goodman and Williams (2007) recommend student-size replicas of information boards used by the whole class be provided to a student with autism. Teachers can address UDL's multiple means of representation with ADAPT by using direct instruction in the acquisition phase of learning, while allowing students to read about the topic or view the topic (CAST, 2015; Lee & Picanco, 2013). The teacher could continue with direct instruction, or allow the student to work independently in mastery learning or cooperatively in structured peer tutoring for the fluency and maintenance phases of learning (Lee and Picanco, 2013).

While all of the inclusive practices here benefit students with autism, they are not meant to be used exclusively for students with autism. McKeon et al. (2013) note the professors who responded to the survey found the same challenging behaviors in all students, not just those students with autism. General education teachers who employ these methods on a regular basis for all students, increase each student's access to the general education curriculum. Inclusive

practices are not meant to be implemented for one specific student, but rather, these structures and strategies are meant to benefit all students (Jiménez et al., 2007). The following practices were consistently found in research to be beneficial to students with autism and also align with UDL through the phases of learning (CAST, 2015; Goodman & Williams, 2007; Harrower & Dunlap, 2001; Heflin & Alaimo, 2007; Higginson & Chatfiled, 2012; Huang & Wheeler, 2006; Lee & Picanco, 2013; McKeon et al., 2013; Soukup et al., 2007):

- After giving a set of instructions, students repeat back what they are to do;
- Alert students to the time remaining for a specific task or activity;
- Appeal to student's unique interest;
- Assign roles when working with peers;
- Direct, whole class social skills instruction;
- Give concrete and specific directions;
- Large tasks are broken into small components to be completed in succession;
- Learning objectives explained at the start and reviewed at the end of each instructional event;
- Material on classroom walls support acquisition of current learning objectives;
- Offer choices whenever possible;
- Post visual schedules/timetable;
- Predictable daily routines;
- Provide students with purposeful sensory tools;
- Regular or predictable reinforcement;
- Require a student to respond to an academic prompt;
- Specific classroom rules and consequences that are posted, reviewed and understood;

- Student-size replicas of class-size support material are provided;
- Students see and hear all content; and
- Vary the cognitive demand of activities throughout the day.

Benefits of Inclusive Classroom Practices

Loiacono and Valenti (2010) theorize if the rate of autism is increasing in children ages six to 11, then general education teachers should expect to see an increasing number of students with autism in their classroom. General education teachers need to be equipped with the techniques to meet the learning needs of these students (Loiacono & Valenti, 2010). Inclusive classroom practices require planning, organization, and preparation on the part of a general education teacher. Furthermore, researchers want to know if the effort is effective (Bevan-Brown, 2010; Dymond et al., 2007; Goodman & Williams, 2007; Harrower & Dunlap, 2001; Higginson & Chatfield, 2012; Mckeon et al., 2013; Polirstock & Houghteling, 2006; Safran, 2002). Across the spectrum of students with disabilities, inclusive classroom practices have been found to benefit both students with disabilities as well as their non-disabled peers (Carter & Hughes, 2006; Cole et al., 2004; Downing & Peckham-Hardin, 2007; Foreman et al., 2004; Harrower & Dunlap, 2001; Loiacono & Valenti, 2010).

Students with mild to moderate disabilities are expected to access the general education curriculum and demonstrate growth or mastery each year. Cole, Waldron, and Majd (2004) compared the academic gains of students with mild to moderate disabilities in a traditional resource pull-out instructional setting to that of students with disabilities in an inclusive general education setting. The research was conducted within the same educational system. Students without disabilities made greater progress in reading and math in an inclusive classroom setting than they did in a classroom without students who required special education services (Cole et

al., 2004). For students with disabilities, there were no significant differences in academic achievement in the two settings (Cole et al., 2004). Of interest, the research did yield a higher percentage of students with disabilities making greater than average academic progress when placed in the inclusive classroom setting (Cole et al., 2004). Overall, Cole et al. (2004) found for students with mild disabilities, inclusive school programs produced as good, if not better, results than traditional pull-out resource settings. Tremblay (2013) compared student performance in an inclusion classroom against a classroom taught by a special education teacher. Tremblay (2013) found the inclusion classroom significantly outperformed the special education only classroom in terms of student performance and attendance. Harrower and Dunlap (2001) provide a review of existing literature regarding inclusive practices specific to students with autism and note documented benefits to full inclusion, such as increased levels of academic engagement, increased social interaction, higher levels of social interaction from peers, larger friendship groups, and more sophisticated individual education plan goals compared to peers who are not receiving the intended curriculum in an inclusive setting.

Inclusive general education classrooms are not without their detractors. Fuchs and Fuchs (1994) suggest the primary advocates of inclusive schools are a very narrow group representing those students with the most severe intellectual disabilities who intend to diminish academic competence in favor of social acceptance. Arguing the intended curriculum of the general education setting is unattainable for students with severe disabilities, Fuchs and Fuchs (1994) assert full inclusion and the elimination of special education renders general education teachers unable to demonstrate their students have mastered the grade level standards. Fuchs et al. (2015) continued to research and continued to assert the inclusive classroom does not benefit students with learning disabilities in academic content acquisition over a long-term. This suggested the depth of intervention necessary for content acquisition is not available to students with

disabilities in an inclusive classroom setting (Fuchs & Fuchs, 1994). Logan, Bakeman, and Keefe (1997) studied students with wide-ranging disabilities and found a much higher rate of intellectual engagement in small group and one-on-one instructions as compared to whole class instruction. Additional research cautions without purposeful opportunities to associate with disabled peers, students with disabilities may be hindered in their opportunity to develop a positive self-identity, make their own choices about forming friendships, and developing group affiliations (Stainback, Stainback, East, & Sapon-Shevin, 1994). In the current decade, literature speaking negatively of inclusion centers on teacher preparation and teacher efficacy to successfully structure the environment to meet the needs of all learners (Park, Dimitrov, Das, & Gichuru, 2016; Sharma, Loreman, & Forlin, 2012; Soleas, 2015).

Conclusion

This research study is grounded in a theoretical framework providing structure to the primary research questions (Ennis, 1999; Ravitch & Riggin, 2012). UDL, developed and refined by CAST (2015), gives meaning to the relationships between the rise in the rates of students with autism in the general education classroom and the necessity for general education teachers to utilize inclusive practices (Brock, 2006; Finke et al., 2009; Gernsbacher et al., 2005; Higginson & Chatfield, 2012; Loiacono & Valenti, 2010; Moores-Abdool, 2010). The need exists for general education teachers to develop classroom environments to increase the success of students with autism in the general education setting (Busby, Ingram, Bowron, Oliver, & Lyons, 2012; Finke et al., 2009; Loiacono & Valenti, 2010; McKeon et al., 2013). Jiménez, Graf, and Rose (2007) described UDL as an approach to education in which teachers design instruction based on the diverse group of learners in front of them at the time, rather than making regular adjustments for students with specific or special needs. CAST (2015) invites teachers to use UDL to build multiple means of engagement, expression, and representation, into the design of the lesson,

classroom instruction, curricular materials, formative assessment, and summative assessment. In doing so, diverse learners are provided with the opportunity to move beyond exposure to the curriculum and gain access to the curriculum (Browder et al., 2006; Jiménez et al., 2007).

This examination of the literature began with a description of the changes in the diagnostic criteria for a medical diagnosis of autism though the last three numbered revisions of the DSM (APA, 1980; APA, 1994; APA, 2013). The autism diagnosis was very specific and narrowly defined in the DSM III (APA, 1980). A candidate was required to meet six of six identifying criteria for a medical diagnosis of autism (APA, 1980; Gernsbacher et al., 2005). In 1994, APA released the first major revision to the criteria for a diagnosis of autism with the DSM IV. The APA (1994) identified 16 separate criteria associated with autism, and an individual had to meet half of those for a medical diagnosis of autism (Gernsbacher et al., 2005). In addition to allowing for a more malleable diagnostic criterion, the DSM IV identified Asperger's Syndrome and PPDNOS as milder forms of autism (APA, 1994).

The release of the DSM V (APA, 2013) removed the separation of Asperger's Syndrome and PPDNOS and reestablished one diagnosis of autism. A new diagnosis, Social (Pragmatic) Communication Disorder (APA, 2013) was introduced as an autism-related disorder. Social (Pragmatic) Communication Disorder is characterized by ongoing difficulties in both verbal and nonverbal communication in social settings (APA, 2013). The domains of diagnostic criteria reduced from three (APA, 1994) to two, social communication and restrictive interests (APA, 2013). A medical diagnosis of autism is currently not required for a student to be served under the special education classification category of autism (USBE, 2016a). However, the student must essentially meet many of the diagnostic criteria of the DSM IV (APA, 1994) and require related services support in addition to special education services (USBE, 2016a).

The examination of the literature found elementary-age students are increasingly being identified with autism (Brock, 2006; Finke et al., 2009; Gernsbacher et al., 2005; Higginson & Chatfield, 2012; Loiacono & Valenti, 2010; Moores-Abdool, 2010). As such, general education teachers must increasingly develop classroom environments to create a successful environment for students with autism in the general education setting (Busby et al., 2012; Finke et al., 2009; Higginson & Chatfield, 2012; Loiacono & Valenti, 2010; McKeon et al., 2013; Soukup et al. 2007). From students with the most profound disabilities to students with mild to moderate disabilities, researchers have shown an inclusive classroom setting is beneficial to both the student with disabilities, the non-disabled peer, and faculty or staff facilitating the inclusion (Carter & Hughes, 2006; Cole et al., 2004; Downing & Peckham-Hardin, 2007; Foreman et al., 2004; Harrower & Dunlap, 2001; Loiacono & Valenti, 2010).

Based on the diagnostic criteria, several characteristics of students with autism were identified (APA, 2013; USBE, 2016a). The observable characteristics of a student with autism were identified as: (a) an impairment to social interaction;(b) an impairment to communication; (c) restricted, repetitive behaviors; (d) resistance to change in environment or routine; and, (e) unusual sensory response (APA, 2013; USBE, 2016a). Both parents and educators identify the need to adjust instructional practices to meet the academic and social needs of students with autism (Bevan-Brown, 2010; Higginson & Chatfield, 2012; McKeon et al., 2013).

Inclusive educational practices created and deployed under the guidelines of UDL (CAST, 2015; Jiménez et al., 2007) can create a successful educational environment for students with autism as well as all other learners in the setting. Harrower and Dunlap (2001) reviewed inclusion strategies with respect to students with autism, and concluded multicomponent interventions are more prevalent in general education classrooms than single intervention

strategies. This is consistent with the guidelines of UDL (CAST, 2011; CAST, 2014). In creating inclusive educational environments for students with autism, educators must consider:

- the social environment (Bevan-Brown, 2010; Goodman & Williams, 2007; Heflin & Alaimo, 2007; Huang & Wheeler, 2006; McKeon et al., 2013);
- the physical environment (Bevan-Brown, 2010; Goodman & Williams, 2007; Heflin & Alaimo, 2007; Huang & Wheeler, 2006; McKeon et al., 2013);
- instructional practices (Bevan-Brown, 2010; Goodman & Williams, 2007; McKeon et al., 2013); and,
- instructional materials (Heflin & Alaimo, 2007; Huang & Wheeler, 2006; McKeon et al., 2013; Soukup et al., 2007).

Research supports the general education teacher taking the time to create an inclusive environment as benefits to students, educators, administrators, and para-professionals working in the inclusive classroom setting (Cole et al., 2004; Harrower & Dunlap, 2001, Jiménez et al., 2007).

The literature review suggests the need for further inquiry into inclusive practices for students with autism. Specifically, investigation should be completed into the academic achievement of students with autism in inclusive general education classrooms, as compared to students participating in the pull-out resource model (Cole et al., 2004). This research could be modeled after the study and data analysis completed by Cole et al. (2004). Additionally, a very specific narrative research design (Creswell, 2014) specifically describing a classroom successfully structured under the framework of Universal Design and employing inclusive practices would add to the literature.

Chapter III

Research Design and Methods

Introduction

The means to answering research questions is found in obtaining accurate data (Creswell, 2014). This chapter discusses the research design and methodology used to obtain and analyze the data central to the research questions, beginning with the setting for the research and the participants. The sampling technique and research design are described, data collection methods and analytical procedures are outlined, and the chapter concludes with a discussion of the limitations of the interpretation of results.

The objective of this study was to design and explore several vigorous research questions and to add to the body of existing research (Creswell, 2014; Gall et al., 2006; Marshall & Rossman, 2016). The data collected from general education practitioners contributes to the efforts to accurately estimate occurrence rates of autism, both diagnosed and undiagnosed. Additionally, this investigation aimed to fill a gap in current research regarding the inclusion of students with autism in the general education setting. Furthermore, participants were given an opportunity to respond to open-ended questions in an effort to inform the research beyond what could be collected through quantitative means.

This research investigated multiple aspects of autism in the general education setting in the elementary school environment. The three research questions this study sought to answer were:

1. In a general education elementary school classroom, how does the rate of students with autism or multiple characteristics of autism compare to the state reporting rates of autism?

2. To what extent are general education elementary teachers able to identify the elements of an inclusive general education classroom research has found to benefit students with autism?
3. To what extent do general education elementary teachers employ autism-specific teaching strategies?

Research Design

A mixed methods study, utilizing a cross-sectional survey design with open-ended questions, was used for this research (Creswell, 2014). As explained by Creswell (2014), "mixed methods research is a good design to use if you seek to build on the strengths of both quantitative and qualitative data" (p. 535). The purpose of cross-sectional survey design is to collect data at one point in time with the intent of examining current practices in the field (Creswell, 2014; Kuada, 2012). The research examined the current demographics of general education elementary classrooms with respect to the percentage of students with autism or possible undiagnosed autism. Additionally, the current practices of general education teachers with respect to inclusive classroom practices and measured the needs of the educational community as it related to the identification of effective practices for students with autism were examined (Creswell, 2014; Gall et al., 2006; Gunter, 2002; Kalof et al., 2008; Punch, 2003). The survey was descriptive in nature, asked the same questions of many teachers, and was a self-report measure (Fraenkel & Wallen, 1995; Gall et al., 2006; Gunter, 2002; Kalof et al., 2008; Punch, 2003). In conjunction with the quantitative data, participants were asked to respond to open-ended questions. The open-ended questions allowed opportunities for teacher to expand on the data provided. Participants were asked what factors necessitated a special accommodation for a student in their classroom, how students with significant learning differences impact the efficient delivery of general education content standards, the ideal learning environment for students with

significant learning differences, and about their skill set as it relates to having students with autism in their general education classroom. The open-ended items provided elements of depth and perspective which complemented the data collected (Bryman, 2006; Gorard & Taylor, 2004; Jensen, 2002; Kuada, 2012).

Participants

This research was conducted in elementary schools located in two suburban school districts in Utah. Though the state in which the research was conducted is given to aid in replication or expansion of the research, pseudonyms are used for the participating school districts and schools (Creswell, 2014). In Utah, 75.4% of the population live in four counties north of, south of, and including Salt Lake City, the city in which the state capitol is located (U.S. Census Bureau, 2012). The region is called the Wasatch Front in reference to its location on the front side of the Wasatch mountain range. There are 11 school districts in these five counties (USBE, 2015a). This accounts for 74.5% of the non-charter public school population (USBE, 2015a). The district in which the research works was excluded. While there were districts more closely aligned in terms of total enrollment, the disaggregated student demographic data for the Washington and Van Buren School Districts were similar (USBE, 2017).

Washington School District had a K-12 total enrollment of 52,324 students (USBE, 2017). Of those, 28,000 were enrolled in kindergarten through sixth grade, or elementary school (USBE, 2017). Washington School District employed approximately 1,008 elementary school teachers (USBE, 2015c). Second, Van Buren School District had a K-12 total enrollment of 31,184 students (USBE, 2017). Elementary school enrollment in the Van Buren School District

was 2,199 (USBE, 2017). The Van Buren School District employed 584 elementary school teachers (USBE, 2015c).

Purposeful sampling was applied to the selection of study participants (Creswell, 2014; Gall et al., 2006). The participating schools each had a K-6 enrollment between 700 and 800 students. The survey population was general education elementary school teachers in grades one through six. Kindergarten was excluded because it is not mandatory in Utah, and existing kindergarten service models vary between half day, extended day, and full day programs. From the two school districts where permission to conduct research was obtained, all the general education teachers in the sample schools were invited to participate. Written approval was obtained from the two participating school districts (Appendix B, C). Table 1 illustrates the district demographic information (USBE, 2017).

Table 1

District Demographic Profiles

	2015 Enrollment	**Ethnic Minority**	**Low Income**	**Special Education**	**English Language Learner**
Washington School District	52,324	22%	22%	11%	3%
Van Buren School District	31,184	18%	31%	13%	3%
Utah Public School Districts	566,387	25%	36%	11%	6%

After the participating elementary schools were selected, the initial sample size of the research was 10 elementary schools, which yielded a population sample of 272 general education elementary teachers. Table 2 illustrates the demographic profile of the participating schools.

Table 2

School Demographic Profiles

School	2015 Enrollment	Ethnic Minority	Low Income	Special Education	English Language Learner
Adams School	746	28%	40%	11%	5%
Jefferson School	788	12%	19%	8%	1%
Madison School	747	33%	37%	11%	10%
Monroe School	765	13%	26%	12%	1%
Jackson School	712	15%	24%	10%	2%
Harrison School	770	15%	23%	11%	3%
Tyler School	786	19%	31%	12%	2%
Polk School	764	11%	23%	14%	1%
Taylor School	724	11%	28%	11%	2%
Fillmore School	761	23%	40%	14%	3%

Schools were selected during the 2015-2016 school year, but the survey was administered during the 2016-2017 school year. The demographic profile changed slightly for each district and school. The demographic comparison from selection to administration can be found in Appendix D (USBE, 2017).

Upon entering the electronic survey, participants were provided with the elements of informed consent (Appendix E). The informed consent alerted participants to the fact the research study had been approved by their superintendent, but participation was voluntary and they could choose to complete all or part of the survey without incentive or penalty. Because the survey was anonymous, selecting "continue" to start the survey acted as the respondent's signature they understood the purpose and nature of the data collection. The survey was distributed to 272 general education teachers. Forty-three participants agreed to participate in all or part of the survey. One male participated in the survey; 38 females participated, and four did not indicate gender. The average number of years teaching among the participants was 26. The survey year was the first year of teaching for one participant. On the other end of the scale, one participant reported the survey year to be her 40th year teaching. Table 3 illustrates the number of participants within ten year ranges of teaching experience.

Table 3

Participant Years of Teaching Experience

Years of Experience	**Number of Participants**
1 – 10	16
11 – 20	11
21 – 30	11
31 – 40	2

The respondents are a relatively stable teaching force. The average length of time at their current school was 19 years. Twenty-six participants had been at their current school for one to 10 years; 12 have been at their current school for 11 – 20 years. Two participants have been at their

current school for 21 – 30 years. Twenty-five of the respondents teach in the primary grades -- first, second, or third grade. Ten respondents taught first grade; four taught second grade; and, 11 taught third grade. Sixteen respondents represented fourth, fifth, and sixth grades. Four of the participants taught fourth grade; eight taught fifth grade; and, four other participants taught sixth grade.

Seventeen of the 43 participants (39.5%) reported having a Master's Degree. Two of the participants had an Education Specialist degree. There are four possible license options for elementary school teachers in Utah. Fourteen participants had an Elementary K-3 license; 36 had an Elementary 1 – 8 license. None reported having a Secondary (grades 6-12) license. One reported having a special education K – 12+ license. Three participants did not provide their licensing information. The participants were also asked about endorsements on their teaching license. Eighteen respondents did not report any additional endorsements. Fourteen participants reported one endorsement; six participants reported two endorsements; and, five participants reported having three endorsements on their teaching license. The most common endorsement held is English as a Second Language (ESL). A summary of reported endorsements can be found in Table 4.

Table 4

Participant Endorsement Summary

Endorsement	**Number Reporting**
Computer Science	1
Dual Immersion	4
Educational Technology	1
English	2
ESL	16
Gifted and Talented	4
Information Technology Education	1
Keyboarding Education – Elementary	1
Mathematics – Level 2	1
Mathematics – Elementary	3
Reading Level I (Basic)	2
Reading Level II (Advanced)	2
Social Studies	1
Special Education	1
World Language	1

Protection of human rights. The researcher completed the National Institutes of Health's (NIH) training for Protecting Human Research Participants. The certificate of successful completion can be found in Appendix F. The researcher also filed for approval of research through Northwest Nazarene University's institutional review board, which is titled the

Human Research Review Committee (HHRC). The committee reviewed the proposal and protocols and granted approval for the study to be conducted (Protocol Number 19042016). This approval can be found in Appendix G. NIH and the HHRC provide for considerations for the protection of human subjects in research: beneficence; respect; and, justice. The potential risks to the participant were loss of time and a level of uncomfortableness associated with self-reflection and self-reporting. In order to demonstrate respect for the autonomy of the participant, there was no coercion to participate and the individual could stop the survey at any point without fear of reprisal. The selection of the participants and the survey itself was non-discriminatory. Participants were selected only for their location of employment.

Data Collection

A web-based survey instrument was used to collect the responses of the study participants (Gall et al., 2006). Both qualitative and quantitative data were collected in the survey. Mixed methods research combines the analysis and collection of quantitative and qualitative data in a single study to further the understanding of the research questions that one method alone cannot provide (Creswell & Plano Clark, 2011). The researcher created the survey to fit the specific nature of the research questions of the study. The survey was administered though Qualtrics and can be found in Appendix E. The text of the survey included the informed consent statement agreed to upon entering the survey. In order to reduce variability in response, the quantitative items in the questionnaire were close-ended questions (Creswell, 2014). Survey questions were initially derived from the post-secondary work of McKeon et al. (2013) and the professional development project by Higginson and Chatfield (2012) which trained teachers in autism spectrum disorder knowledge and teaching strategies. After answering a series of questions designed to focus on one of the three research questions, participants were asked to

respond to open-ended questions related their practice and experience as an education professional.

Reliability and validity. The survey was field tested by the researcher prior to publication. The researcher, and elementary school principal, first asked teachers in her own building to complete the quantitative portions of sections two, three, and four of the survey in a conversational setting with the researcher. As the researcher regularly observes the teachers and knows the students in the classroom, the researcher refined wording confusing to the respondent. Next, the researcher asked different teachers in her own building to complete parts two, three, and four of the survey without conversation. Again, the researcher compared the respondent's answers with the researcher's knowledge of the teacher's practice and the students in the classroom to the participant's response. This also helped the researcher build an estimation of how long it will take a participant to complete the survey. As a result of piloting the survey with the researcher's own teachers, the example for completing the last quantitative item of part three was developed. This study was not conducted in the researcher's own school district, so the researcher next asked a principal peer to have teachers in a different building complete parts two, three, and four of the survey, and asked the principal to evaluate the accuracy of the responses based on the principal's knowledge of the teaching strategies used by the respondent and the students in the classroom. Because teachers are eager to share their craft, the qualitative text boxes were added to each part of the survey so respondents could elaborate on the survey items and provide robust personal experience to enhance the overall quality of the data obtained.

The reliability of the survey was estimated using Cronbach's coefficient alpha for weighted items found on the Likert scale (Gall et al., 2006). The Cronbach's alpha for the survey was 0.80 for Part II and 0.85 for Part IV, indicating that the items were statistically reliable and therefore could be included in the analysis without compromising the data (Lynn,

1986, Polit & Beck, 2006). The validity of the instrument was evaluated with evidence from processing the responses, and evidence from the internal structure (Gall et al., 2006). Prior to administering the survey, drafts of the items were presented to practitioners known to the researcher but who were not participating in the study. The researcher and the mock participant could work together to word survey questions in a way that helped the researcher obtain the desired information. As the survey was refined, the researcher could work with additional mock participants who did not have previous knowledge of the editing process. For a final face validity check, two participants took the entire survey. The researcher already knew the demographic information of the classroom and teacher and could compare survey responses to known data.

Content validity for the survey instrument was measured by the two-stage process outlined by Lynn (1986). In the developmental stage of the survey, content validity was addressed through domain identification, item generation, and instrument formation (Lynn, 1986; Polit & Beck, 2006). The identified domain for the survey was effective instructional practices for students with autism. Practices prevalent in the literature were selected. To limit the length of the survey, practices were culled using the following criteria: (1) frequency with which the strategy appeared in educational literature as being effective in the education of students with autism; (2) the degree to which the strategy could be employed in a general education classroom; and, (3) evidence of the strategy being effective for students without autism. The instrument was formed using standard methodology and piloting. The content validity index (CVI) at the item level (I-CVI) and the scale level (S-CVI/Ave) was developed by surveying autism experts in the field of education (Lynn, 1986; Polit & Beck, 2006). Eleven experts in the field of education with significant experience supporting the education of students

with autism ranked the effectiveness of the educational practices used in the survey with respect to students with autism in the general education setting.

Rates of autism. This first aspect of the survey was for respondents to identify the total number of students assigned to their homeroom class. Respondents identified the total number of students who receive special education services and, specifically, how many of those students had a special education eligibility classification of autism. Respondents were also asked the number of students in their class who had a medical diagnosis of autism and how many of those students received special education services. Respondents were then presented with a list of observable characteristics of autism and asked to determine the number of general education students not diagnosed with autism or receiving any sort of special education who presented with two or more of the observable characteristics.

Use of inclusion strategies. The degree to which general education teachers employed autism-specific strategies in their social environment, physical environment, instruction, and instructional materials was measured using a Likert scale. A Likert scale measures attitude toward a particular construct (Gall et al., 2006). The aspect of attitude was the focus of the research was the behavioral component (Gall et al., 2006). The behavioral component refers to the participant's disposition to act in a particular way (Gall et al., 2006). In this research, the survey endeavored to elicit a general education teacher's level of implementation of autism-specific inclusion strategies to the entire class.

Respondents were presented with a list of 12 autism-specific inclusion strategies which represented three items in each of the four education aspects (social environment, physical environment, instruction, and instructional materials) and asked to self-report the level use of the strategy. The scales presented to the general education teachers were: "Never"; "Rarely"; "Seldom"; "Often"; and, "Always". Those scales were defined within the instrument as: "I do

not do this"; "I do this once a month or less"; "I do this once a week or less"; "I do this more than once a week"; and, "This is a part of our daily routine", respectively. The autism-specific inclusion strategies were derived from practices in line with the implementation of Universal Design for Learning (UDL) or Accommodating Diversity by Analyzing Practices of Teaching (ADAPT) in the general education classroom (CAST, 2015; Heflin & Alaimo, 2007; Higginson & Chatfield, 2012; Jiménez et al., 2007; Lee & Picanco, 2013; McKeon et al., 2013; Soukup et al., 2007).

Knowledge of inclusion strategies. In order to assess the extent to which teachers could identify instructional strategies beneficial to students with autism, they were presented with choices and asked to select one. By offering a closed-ended survey item to assess this construct, the respondents could answer using the response options provided (Creswell, 2014). While one intent of this choice was to reduce the amount of time a respondent spent on an item, the statistical benefit was easily comparable response data (Creswell, 2014). Inclusion strategies selected for presentation included those found in previous research, including those research-based inclusive practices with documented effect size (Heflin & Alaimo, 2007; Higginson & Chatfield, 2012; McKeon et al., 2013; Sokup et al., 2007. The inclusion strategies offered for choices were all research-based and meet the criteria set forth in UDL (Brand et al., 2012; CAST, 2015; Denning & Moody, 2013; Hitchcock et al., 2002; Jiménez et al., 2007; Katz, 2013; Lee & Picanco, 2013; McGuire et al., 2006).

Analytical Methods

Data collected from the web-based survey instrument was electronically transferred into a spreadsheet. The original survey responses were retained in their anonymous, but unaltered, form. A copy of the survey responses was then used for evaluation. The numerical data from the self-reporting of the number of students in various reporting categories were left as numeric

data. The data from the Likert scale questions was recoded to a one to five scale with one representing “Never” and five representing “Always”. Participant responses from the remaining 12 questions regarding inclusive practices were categorized into ordinal data. The data was cleaned & missing data were addressed (Creswell, 2014). So long as participants responded to all of items in one of the three sections of the survey – classroom demographics, use of inclusion strategies, and knowledge of inclusion strategies -- responses were included in the respective data analysis. With respect to the self-reporting of inclusion strategies on the Likert scale, the survey instructions informed respondents blank answers will be interpreted as “Never” utilizing the practice. Quality data was then imported into Statistical Package for the Social Sciences (SPSS) 24.0 for analysis.

Qualitative data was exported into an excel spreadsheet and cross-checked to ensure the exported data matched the data exactly as was saved from Qualtrics. In the process of cross-checking, responses were read multiple times and broad themes emerged. As noted by Creswell (2014), the purpose of the coding process “is to make sense out of text data, divide it into text or large image segments, label the segments with codes, examine codes for overlap and redundancy, and collapse these codes into broad themes” (p. 243).

The first research question pertaining to the rate of students with autism in elementary school classrooms was answered with quantitative data. Data regarding the occurrence rates of students with autism for public elementary schools in the State of Utah was retrieved from state reporting of special education classification data as required by the IDEA (2004) (USBE, 2015b). Descriptive statistics consistence of frequency and mean were used to compare the occurrence rates of students with autism across the population and the reported rates in the classroom (Creswell, 2014). This rate was compared to the reported occurrence rate of autism in the state. Quantitative data was also collected as general education teachers were asked to report

the extent to which they regularly employ 12 instructional practices, and when asked to select one of two instructional practices they thought was most effective for students with autism in the general education setting.

The second and third research questions address the participant's knowledge of instructional strategies effective for students with autism and the frequency with which they are used in the general education setting. The instructional strategies presented in Part II and Part IV of the survey were derived from UDL or specific research into effective strategies for students with autism (Bevan-Brown, 2010; CAST, 2011; CAST, 2014; Goodman & Williams, 2007; Harrower & Dunlap, 2001; Heflin & Alaimo, 2007; Higginson & Chatfield, 2012; Huang & Wheeler, 2006; McKeon et al., 2013; Soukup et al., 2007). The quantitative data pertaining to the use of autism-specific inclusion strategies was ordinal data collected through a Likert scale. The quantitative data collected involving a teacher's identification of inclusive practices effective for students with autism was collected through forced choice. To answer each research question, the quantitative data was first analyzed with simple descriptive statistics to obtain a frequency distribution of responses (Creswell, 2014). Several statistical tests were considered to examine group differences between responses, but were invalid due to the small *n*-size of respondents ($n = 43$) and the lack of variability in responses between groups (Laerd, 2015; Tanner, 2012).

The qualitative data was collected through an open-ended question asking teachers (1) how students with significant learning differences impact the efficient delivery of the general education content standards in the classroom; (2) how they structure the general education classroom environment for students with significant learning differences; and, (3) to describe their skill set for teaching students with autism and how it was acquired. These open-ended

questions allowed teachers to elaborate on teaching students with autism in the general education setting. This information provided context for the participant's ability to identify instructional practices beneficial to students with autism and the reported use of autism-specific teaching strategies in the general education setting. For each of the open-ended questions, responses were coded to increasingly narrow text segments to identify themes (Creswell, 2014; Marshall & Rossman, 2016). Frequently occurring themes were counted and utilized to provide an educator's perspective that furnished depth and understanding to the quantitative data (Creswell, 2014; Marshall & Rossman, 2016; Miles & Humberman, 1994).

Delimitations

Delimitations, or boundaries, were set by the researcher to contain the data collection and analysis. The delimitation of a study is defined as a deliberate narrowing of the inquiry by the research conducted and the methods utilized (Creswell, 2014; Rudestam & Newton, 2015). The following delimitations were identified for this inquiry:

- The sample population was narrowed to general education teachers working in 10 elementary schools in two school districts in a geographically large metropolitan area.
- The participants were general education teachers who may or may not have experience, training, or knowledge of autism and may or may not have taught or be teaching any students with autism.
- The survey did not ask about all possible instructional practices. It was limited to 12.

Limitations

The identification of the limitations and admission of researcher bias addresses consequential validity of the research study (Gall et al., 2006). Limitations, those restrictions in the study over which the researcher does not have control, potentially weaken the results

(Creswell, 2014; Rudestam & Newton, 2015). The mixed methods nature of the research design and the survey method of data collection are two limitations identified at the onset of the study (Gunter, 2002; Marshall & Rossman, 2016). There are many limitations to consider within the results of the data collected from this survey research. Limitations of surveys identified by Gunter (2002) were: (1) the dependency on *post hoc* data contributes to inaccuracy of description, and (2) verbal descriptions of observable practice do not fully represent real situations. With any survey instrument, length must be a consideration. If participants felt the survey was too long or required too much effort, they may have not responded at all. It is also possible participants fatigued if they felt the survey required too much effort. In this case, the responses would deteriorate. The survey was optional for participants to complete. Participants had no incentive to complete the survey. Survey responses contained no identifying information with respect to the school or district from which they came, so the researcher could not follow up with respondents who did not participate upon initial offering. Further, the survey was accessible via a web link, but not password protected. It is also possible the survey was forwarded to colleagues and answered by educators outside of the desired sample. The participant pool was described as suburban elementary teachers in grades one through six in Utah. The narrow sample population is also a limiting factor.

Additional limitations of the investigation include:

- Participants may or may not have known the medical diagnosis or special education classification of their students at the time the study was conducted.
- Because autism is a spectrum disorder, it presents differently in each student, students may be incorrectly identified by the respondent (Davidson, 2015).

- Participants were identified from the web pages for each school. At the time of data collection, it is possible the participant was no longer at the identified school or teachers new to the school were not yet on the school's website.
- One district had strict limits on the amount of contact a researcher could initiate with participants to seek their cooperation in completing the survey. In the research approval process for one of the participating districts, specific direction is given to potential researchers they may contact participants twice – once during the initial invitation to participate and once to remind participants to complete the survey. This limitation may have impacted the overall response rate to the survey.
- The overall response rate to the survey was low. Only 43 teachers participated in the study. Because the study was conducted via the internet and included no face-to-face contact, it is possible the survey did not reach participants due to school district filtering and firewalls, the survey was sent to junk mail or clutter, or the teacher was engaged in other professional obligations and did not take the time to access the survey. While the small *n*-size restricted the analysis of the quantitative data, participants did provide rich and robust qualitative data. Small sample sizes limit data analysis to the investigation of larger differences between measures and restricts the ability to find significant relationships in the data (Sauro, 2013; University of Southern California, 2017).
- A large *n*-size decreases sampling error and increases confidence the results can be generalized (Creswell, 2014). The research may not be generalizable across education settings because it does not have a large *n*-size or include teachers in rural, urban, or inner city locations.

- Finally, the researcher's own bias may also limit the study. Like Jiménez et al. (2007), this researcher believes inclusive practices are not meant to be implemented for one specific student, but rather, these structures and strategies are meant to benefit all students. Constant comparative analysis and analytic induction helped to curb researcher bias in the coding of qualitative data (Marshall & Rossman, 2016). Additionally, as the survey tool, and not the researcher, collected the qualitative data, the researcher was separated from the data collection (Fusch & Ness, 2015).

Chapter IV

Results

Introduction

General education teachers are increasingly responsible for the comprehensive education of a diverse group of learners in the classroom, including students with autism (Finke et al., 2009; Gernsbacher et al., 2005; Kim et al., 2011; Loiacono & Valenti, 2010; Pinborough-Zimmerman et al., 2012; Russell et al., 2010). It would be inefficient for general education teachers to continuously make unique adjustments in instruction and content for each individual learner. Diversity in the classroom does not occur in dichotomous groups where individual programs might meet the needs of a specific group of learners. Teachers must be able to design an environment to meet the instructional needs of the diverse group of learners in front of them at the time (Jiménez et al., 2007; Lee & Picanco, 2013).

Continual analysis, increased awareness, and additional understanding of autism imply general education teachers will increasingly interact with a higher percentage of students with autism (Brock, 2006; Finke et al., 2009; Gernsbacher et al., 2005; Higginson & Chatfield, 2012; Loiacono & Valenti, 2010; Moores-Abdool, 2010). The most recent data available from the Centers for Disease Control and Prevention (CDC) identify one in every 68 children (1.47%) as having a diagnosis of autism (Baio, 2014; Christensen et al., 2012). Emerging research suggests an undiagnosed rate of students on the autism spectrum much higher in the elementary school settings (Kim et al, 2011; Russell et al., 2010). While there may be students in the classroom who exhibit characteristics of autism but are not diagnosed, general education teachers also serve students who have a diagnosis of autism but do not qualify for special education services in the educational setting (Finke et al., 2009; Loiacono & Valenti, 2010; Moores-Abdool, 2010; Pinborough-Zimmerman et al., 2012). In a longitudinal study conducted in conjunction with the

Utah State Health Department and the Utah State Board of Education --- the state where this research was conducted -- researchers approximated 20% to 50% of the individuals in their data set were diagnosed with autism did not receive private or public special education services of any kind (Pinborough-Zimmerman et al., 2012, p. 525).

The body of research addressing occurrence rates of autism implies teachers should be prepared to encounter students who exhibit multiple characteristics of autism, but do not have a diagnosis that might allow them access to a 504 plan, an IEP, or specific healthcare services (Russell et al., 2010). To facilitate the delivery of the intended curriculum for all students in the classroom, general education teachers should utilize research based classroom strategies and instructional design found beneficial to both students with autism and students with other or no disabilities (Finke et al., 2009; Loiacono & Valenti, 2010). To examine the prevalence of autism and the classroom strategies and instructional design currently used in the general education setting, the following research questions were developed:

1. In a general elementary education classroom, how does the rate of students with autism or multiple characteristics of autism compare to the state reporting rates of autism?
2. To what extent are general elementary education teachers able to identify the elements of an inclusive general education classroom that research has found to benefit students with autism?
3. To what extent do general elementary education teachers employ autism-specific teaching strategies?

This chapter describes the results from an examination of current practices in the field attained through a mixed methods cross-sectional survey design (Creswell, 2014). Forty-three elementary school teachers in two school districts completed the survey instrument and over

half (26 respondents) provided additional responses to open-ended survey questions. These responses provided depth and perspective to the benefits and challenges of the inclusive general education environment (Bryman, 2006; Gorard & Taylor, 2004; Jensen, 2002; Kuada, 2012). As discussed in Chapter 3, the survey instrument was field tested, piloted, and examined for content validity prior to implementation.

Characteristics of Subjects

The comprehensive analysis of this data included a disaggregation of the characteristics of the participants who provided the information in the study. Forty-three participants agreed to participate in all or part of the survey. The disaggregated data of participant years of teaching experience and teaching endorsements are displayed in Table 3 (pg. 58) and Table 4 (pg. 60), respectively. One male participated in the survey. Thirty-eight females participated, and four individuals did not indicate gender. The average number of years teaching among the participants was 26. The survey year was the first year of teaching for one participant. The survey year was the 40th year of teaching for one participant. Twenty-five of the respondents teach in the primary grades – first, second, or third grade. Ten respondents taught first grade; four taught second grade; and, 11 taught third grade. Sixteen respondents represented fourth, fifth, and sixth grades. Four of the participants taught fourth grade; eight taught fifth grade; and, four other participants taught sixth grade.

Seventeen of the 43 participants (39.5%) reported having a Master's Degree. Two of the participants had an Education Specialist degree. There are four possible license options for elementary school teachers in Utah. Fourteen participants had an Elementary K-3 license; 36 had and Elementary 1 – 8 license. None reported having a Secondary (grades 6-12) license. One reported having a special education K – 12+ license. Three participants did not provide their licensing information. The participants were also asked about endorsements on their teaching

license. Eighteen respondents did not report additional endorsements. Fourteen participants reported one endorsement; six participants reported two endorsements; and, five teachers reported having three endorsements on their teaching license. The most common endorsement held was English as a Second Language (ESL). Sixteen participants held ESL endorsements. ESL represented 39.0% of all endorsements.

Reliability Results

Gliem and Gliem (2003) emphasized the importance of calculating Cronbach's alpha for each subscale in the overall measure and conducting data analysis at the subscale level as opposed to the individual item level or full measure. The reliability of this measure was evaluated for two different subscales. Part II and Part IV of the survey examined the frequency of use of instructional strategies and a practitioner's ability to identify a researched-based strategy for students with autism given two choices. The instructional strategies presented in the survey were extracted from the post-secondary work of McKeon et al. (2013); the professional development project by Higginson and Chatfield (2012) which trained teachers in autism spectrum disorder knowledge and teaching strategies; and, the effective instructional practices for students with autism as researched and reported by Heflin and Alaimo (2007). The strategies selected for the study also met the criteria for UDL (CAST, 2011; CAST, 2014) and ADAPT (Lee & Picanco, 2013). Part II of the survey measured the frequency with which respondents utilized specific instructional practices. The scale had a high level of internal consistency, as determined by Chronbach's alpha of 0.984 (Laerd Statistics, 2015; Salkind, 2014). Part IV of the survey measured the respondent's ability to identify inclusive classroom practices which also benefit students with autism. The scale had a high level of internal consistency, as determined by Chronbach's alpha of 0.973 (Laerd Statistics, 2015; Salkind, 2014).

Validity Results

A Content Validity Index (CVI) for Part II and Part IV of the survey was determined in accordance with calculation and reporting procedures outlined by Polit and Beck (2006). The CVI reporting for this instrument consists of two measures, Item Content Validity (I-CVI) and Scale Content Validity (S-CVI/Ave). I-CVI refers to the strength of the item's ability to measure the construct in the scale (Polit & Beck, 2006). A scale with excellent I-CVI should have a minimum of 0.78 agreement per item if the panel consists of six to 10 experts (Lynn, 1986; Polit & Beck, 2006). S-CVI/Ave refers to the overall content validity of the instrument. In 1992, Davis recommended a minimum S-CVI of 0.80. As Polit and Beck (2006) refined and clarified the work of Davis (1992) and Lynn (1986), they recommended the S-CVI/Ave of 0.90 or higher.

A panel of 11 experts in the field of education reviewed the survey items regarding instructional practices teachers frequently use as well as forced choice items to identify a strategy best suited for a student with autism in the general education setting. The panelists were comprised of three school psychologists, two school administrators, two district special education administrators, two district autism specialists, one district special education coordinator, and one occupational therapist. One panelist held a Doctorate Degree, three earned Education Specialist Degrees, one obtained a Master's with Specialist Degree, and the remaining six had Master's Degrees. The panel was asked to report the means through which they acquired their advanced knowledge of autism. Ten of the 11 experts reported acquiring their advanced knowledge of autism through work experience. All the experts acquired knowledge of autism through study in conjunction with an advanced degree or through personal interest which resulted in self-study. Table 5 details the responses from the expert panel regarding how they obtained advanced knowledge of autism.

Table 5

Expert Panel's Source of Knowledge of Autism

Self-reported Source of Advanced Knowledge of Autism	**Count**
Work Experience	10
Self-Study/Personal Interest	7
In conjunction with study for a Master's Degree	5
School Psychologist	4
Special Education Teacher	4
In conjunction with study for an Education Specialist Degree	2
In conjunction with study for a Doctoral Degree	1
Direct Personal Knowledge (e.g. immediate family member)	1
Utah Regional Leadership Education in Neurodevelopmental Disabilities (URLEND)	1
Speech-Language Pathologist	1

The panel of experts reviewed the instructional practices presented in Part II of the survey and rated each one as "not an effective practice", "moderately effective practice", "effective practice", or "highly effective practice". Consistent with Polit and Beck (2006), the ratings of "effective practice" and "highly effective practice" were totaled to calculate the range of the Item Content Validity Index (I-CVI). The I-CVI for Part II of the survey ranged from 0.45 to 1.00. Eight of the 12 instructional practices met the recommended I-CVI criteria of 0.78 for six to 10 experts (Lynn, 1986; Polit & Beck, 2006). The Scale Content Validity Index (S-CVI/Ave) for Part II of the survey was 0.80. The content validity results from the expert panel are detailed in

Appendix H. The S-CVI/Ave fell within the acceptable standard of 0.80 put forth by Davis (1992) and that of 0.90 by Polit and Beck (2006). The CVI calculation for this scale employed 11 experts. Polit and Beck (2006) note an increase in experts will likely result in a decrease in CVI due to the difficulty in achieving agreement as the number of individuals in the group increases. Davis (1992) noted an expert panel with diverse backgrounds in education and experience also increases the potential for disagreement in content validity.

In Part IV of the survey, respondents were forced to select one of two instructional practices they believed would be most effective for students with autism in the general education setting. The panel of 11 experts were asked to do the same. The I-CVI for the instructional practices ranged from 0.36 to 1.00. Seven of the 10 instructional practices presented to the experts met the recommended I-CVI criteria of 0.78 for six to 10 experts (Lynn, 1986; Polit & Beck, 2006). The Scale Content Validity Index (S-CVI/Ave) for Part IV of the survey was 0.85. These content validity results from the expert panel are provided in Appendix I. The S-CVI/Ave is within the acceptable standard of 0.80 put forth by Davis (1992) and that of 0.90 by Polit and Beck (2006). There is variation presented in the content validity results that follow. Content Validity Expert 11 stated, "We often say if you know a student with autism, you know a student with autism. So often, things are so individual based on how the autism manifests itself." To this point, the phrase "it depends" was used by seven of the 11 (63.6%) content validity experts while explaining an answer or providing additional information.

Results for Research Question 1: Rates of Autism

The examination of the literature found elementary-age students are increasingly being identified with autism (Brock, 2006; Finke et al., 2009; Gernsbacher et al., 2005; Higginson & Chatfield, 2012; Loiacono & Valenti, 2010; Moores-Abdool, 2010). As such, general education teachers must increasingly develop classroom environments to create a successful environment

for students with autism in the general education setting (Busby et al., 2012; Finke et al., 2009; Loiacono & Valenti, 2010; McKeon et al., 2013). The first research question this study sought to answer was: In a general education elementary school classroom, how does the rate of students with autism or multiple characteristics of autism compare to state reporting rates of autism? To fully answer this question, participants were asked to report the number of students assigned to their class, the number of those students who receive special education services, and the number of students who have a 504 Plan. Teachers were then asked to identify the number of students with a 504 Plan or and IEP who were identified as having autism. Next, the participants were given a list of eight observable characteristics described as significant learning differences. They were asked to identify the number of students in their classroom who were not receiving special education services or on a 504 Plan and exhibit three or more significant learning differences in a way that detracts from their social or academic competency. This portion of the data collection can be found in Part III of the survey instrument in Appendix E.

Descriptive statistics consisting of frequency and mean were analyzed to derive average class size, average number of students identified as having autism, and average number of students with significant learning differences. Frequencies were analyzed as means, and results were then compared with state level reporting data. The comparison allowed the researcher to determine if the sample schools' enrollment of students with autism was similar to that of state reporting rates of autism.

General classroom data was obtained from the respondents. The mean class size of the respondents was 28 students. Seven teachers identified their assignment as dual immersion and having two classes of approximately 26 or more students in each session. The most current data available from the Utah State Board of Education reports the average class size for elementary school classrooms in the state was 25 students (USBE, 2016b). This figure includes grades

kindergarten through sixth grade; kindergarten was excluded from this study. During the 2015-2016 school year, median class sizes in the Washington and Van Buren School Districts are reported in Table 6 (USBE, 2016b). This research was conducted in elementary schools located in two suburban school districts in Utah. Though the state in which the research was conducted is given to aid in replication or expansion of the research, pseudonyms are used for the participating school districts and schools.

Table 6

Median Class Sizes

	First Grade	**Second Grade**	**Third Grade**	**Fourth Grade**	**Fifth Grade**	**Sixth Grade**
Washington School District	23	23	24	26	27	27
Van Buren School District	22	22	23	26	26	28
All Utah Public School Districts	23	23	25	26	26	28

Teachers responding to the survey had an average of 2.65 students in their classroom who received special education services and 0.70 students with a 504 Plan. In this sample, 35% of the students who have been identified and were receiving services through an IEP or 504 were identified as having autism. Data from the Centers for Disease Control and Prevention (CDC) report one in every 68 children (1.47%) have been diagnosed with autism (Baio, 2014; Christensen et al., 2012). Other research approximates one child with autism in every 77 in the population for children ages six to eight, or 1.3% (Pinborough-Zimmerman et al., 2012). The data from the respondents represents an observation of 876 students. Teachers reported a total of 11 students, or 1.26%, identified with autism being served with an IEP or 504. This estimation is similar to the CDC occurrence rate as well as the rate approximated by Pinborough-Zimmerman

(2012) for the state of Utah (Baio, 2014; Christensen et al., 2012). This data is summarized in Table 7.

Table 7

Prevalence Rate of Autism

Source of Data	**Estimated or Actual**	**Rate of Autism**
CDC (Baio, 2014; Christensen et al., 2012)	Estimated	1.47%
State of Utah (Pinborough-Zimmerman et al., 2012)	Estimated	1.30%
Research Results	Actual	1.26%

Two different researchers estimated 20 to 50 percent of children diagnosed with autism did not receive special education services of any kind (Pinborough-Zimmerman et al., 2012, p. 525; Stanford & Reeves, 2009). In this sample, 6.54% of the students in each classroom were identified by the teacher as having significant learning differences and not currently identified or receiving services through an IEP or 504. That equates to 1.83 students per classroom who were identified by the teacher as exhibiting three or more characteristics to such an extent it detracts from their social or academic competency and sets them apart from their peers.

After quantitative data was collected that required teachers to focus on students with autism and students with significant learning differences, teachers were asked to reflect on how these students impacted the efficient delivery of the general education content standards in the classroom. Responses were coded, and the coding process increasingly narrowed text segments to identify broad themes (Creswell, 2014; Marshall & Rossman, 2016). Frequently occurring themes provided depth and understanding to the quantitative data (Creswell, 2014; Marshall & Rossman, 2016; Miles & Humberman, 1994). Table 8 presents the themes found in the teacher

responses detailing the impact students with significant learning differences have on the efficient delivery of general education content standards.

Table 8

Codes Derived from Impact to Efficient Delivery

Code	**Frequency**
Disrupt/Distract	14
Time off Lesson Plan	11
Behavior Management	6
General Negative Impact	6
Reaction of General Education Peers	5
Teacher's Attention	4
One-On-One or Small Group Instruction	3
Work Completion	3
Additional Teacher Preparation	3
Time Spent Re-teaching or Reviewing	2
Advanced Disruption of Classroom	2
Student Misses Instruction	2

Respondents were asked how students with significant learning differences impacted the efficient delivery of the intended curriculum. In broad themes, a negative impact on the classroom environment emerged. Specifically, the respondents reported an inability to achieve instructional goals as outlined in the lesson plan due to the time required of the teacher to correct disruptive or distracting behavior. One teacher stated, "For one, it is hard for me as a teacher to

ignore the behavior because I am distracted as I am trying to teach. I know if I'm distracted so are the students around them." Other ways the learning was impacted by students with significant learning differences were in the form of: difficult transitions; seeking negative attention; aggressive behavior towards peers; a general frustration by peers with pace and lack of progress through the intended curriculum; and, struggling to engage in independent work while the teacher works with other students. The primary frustration of working with students with significant learning differences was articulated by a teacher who said, "It is difficult to find a balance between helping them be successful and helping the rest of my class. It would be nice if one thing worked and continued to work, but that is not the reality."

Teachers also discussed the impact students with significant learning differences had on efficient delivery of the general education content standards in terms of instructional adjustments made by the teacher. There was more diversity in this category of responses. Some respondents discussed spending more time in re-teaching and review, shortening the length of content delivery, and continually checking for understanding. Others pointed to the need to use clear, specific language; analyze and make changes to the learning environment through seating changes, provide fidget tools, or engage in active learning more often; and, provide individual instruction or accommodations to students with significant learning differences, even though this is not required though an IEP or 504. Teaches also train peers to ignore disruptive or distracting behavior in an effort to extinguish the undesired behavior. One respondent reflected on each difficult situation to find the antecedent to the behavior so it can be avoided in the future.

Not all comments pertaining to the impact of students with significant learning disabilities on efficient delivery of the general education content standards were negative. Three responses pointed out the positive effects of having students with significant learning differences in the classroom. One teacher relayed "multiple students are quick to go help W. if he is

frustrated and disruptive about anything." Another teacher pointed to the lessons about compassion and acceptance her students have learned. And, finally, a teacher noted efforts to reach students with significant learning differences have "helped me to be more effective in delivering the content in a manner that was engaging for all students."

The percentage of students with a diagnosis of autism and being served under an IEP or 504 in this study was 1.26%, similar to the CDC rate of 1.47% (Baio, 2014). In the state in which this study was conducted, 38% of the elementary students, ages six to 11, who are classified under the category of autism for special education reporting purposes remain in a general education classroom setting 80% or more of the school day (USBE, 2015b). In this study, 35% of the students who have been identified and were receiving services through an IEP or 504 were identified as having autism. Teachers reported 11 different themes regarding the impact of students with autism and significant learning differences in the general education classroom. The next two research questions examined the instructional environment of the general education setting.

Results for Research Question 2: Identification of Instructional Practices

The need exists for general education teachers to develop classroom environments to increase the success of students with autism in the general education setting (Busby et al., 2012; Finke et al., 2009; Loiacono & Valenti, 2010; McKeon et al., 2013). Inclusive classroom practices require planning, organization, and preparation on the part of a general education teacher. The second research question associated with this study asked: To what extent are general education elementary teachers able to identify the elements of an inclusive classroom research has found to benefit students with autism? The examination of this question began by asking teachers their thoughts about inclusion of students with significant learning differences in the general education setting. Next, quantitative data examining the respondents' ability to

identify the elements of an inclusive classroom were examined. Finally, qualitative responses regarding the teacher's skill set in teaching students with autism was examined.

When asked how the respondent would, in an ideal situation, structure the educational environment for students with significant learning differences, respondents provided a view into their ability to identify the elements of an inclusive classroom benefiting students with autism. The coding process narrowed text segments until broad themes emerged (Creswell, 2014; Marshall & Rossman, 2016). Frequently occurring themes provided depth and understanding to the quantitative data (Creswell, 2014; Marshall & Rossman, 2016; Miles & Humberman, 1994). Table 9 presents the themes found in the teacher responses detailing how they would structure the ideal environment for students with significant learning differences.

Table 9

Codes Derived from Question about Inclusion

Code	**Frequency**
Teacher assistant	7
One-on-one or small group instruction	6
Make changes to physical environment or emotional climate	6
Teacher makes accommodations for individual students	6
Structured teacher and classroom	3
Smaller class size	3
Differentiated Instruction	3
Less paperwork to get students help	1
Full time counselor	1
More resource teachers	1

Thirty-seven (86%) phrases from the qualitative analysis referred to solutions within the general education classroom as opposed to only six (14%) phrases indicating the student would better be served in a more restrictive environment consisting of a highly-structured, small setting of students with similar needs staffed by a highly-trained teacher with multiple aides and a modified curriculum. One teacher, advocating educating students with significant learning differences in a separate class stated, “Most of the students that I have taught with [significant learning differences], do great one on one, but I cannot provide that kind of accommodation.

Every child deserves a good education. Putting [significant learning difference] students in a general classroom is not appropriate."

In describing how the educational environment would be structured for students with significant learning differences, the overwhelming suggestions from those respondents who looked for solutions within the general education setting were for more classroom support in the form of teaching assistants (18.9%), and smaller class sizes (8.1%) or small group instruction (6.2%) for all content areas. Several of the responses (8.1%) identified practices of differentiated instruction. In differentiated instruction, the teacher is responsible to analyze the learners in the classroom and tailor instruction to meet the needs of the specific learners (Gunter, Estes, & Mintz, 2016; Himmele & Himmele, 2011; Tomlinson, 2001). Specifically, teachers reported the following practices would create the ideal education environment for students with significant learning differences:

- continuous differentiated instruction;
- creating a mindful classroom environment in which all students are supported in their learning and supportive of one another;
- purposeful, structured teaching; and,
- "observe in what situation they learn the best, cooperate with parents, adjust and support students' individual needs."

Though the open-ended survey item was framed in terms of students with significant learning differences, many of the responses included elements of best practice for students with autism in the general education setting. Those responding included classroom layout, seating arrangement, sensory tools, schedules, and alerting students to transitions as important structures for the educational environment of students with significant learning differences.

Within the survey, participants were presented with 10 sets of valid, yet different, instructional practices. In each set, one item was grounded in research as being more beneficial in the educational setting of students with autism. The autism-specific instructional strategies represent research-based practice presented in a K-12+ setting (Heflin & Alaimo, 2007; Higginson & Chatfield, 2012; McKeon et al., 2013). The data was examined first to determine if the greatest percentage of respondents selected the instructional strategy in the set most beneficial to students with autism. This was completed using descriptive statistics of frequency and mean. It was then examined for group differences in the ability to identify the inclusive instructional practice. Table 10 summarizes the selection of instructional strategies for students with autism in the survey.

Table 10

Identification of Practices Effective for Students with Autism

Instructional Practice	**Respondents Selecting This Practice**	**Respondents Selecting Alternative**	**Item Unanswered**
Regular or Predictable Reinforcement	62.8%	0.0%	37.2%
Require a Response	14.0%	46.5%	39.5%
Cooperative Learning Groups with Roles for Each Student	41.9%	20.9%	37.2%
Appeal to Student's Unique Interests	62.8%	0.0%	37.2%
Alert students to the time remaining for a specific task or activity	58.1%	4.7%	37.2%
Vary the cognitive demand of activities throughout the day	46.5%	16.3%	37.2%
Offer Choices whenever possible	53.5%	9.3%	37.2%
Give concrete and specific directions	62.8%	0.0%	37.2%
Provide sensory tool	20.9%	41.9%	37.2%
Students repeat back instructions	48.8%	14.0%	37.2%

Respondents selected eight of the 10 (80%) practices most effective for social and academic achievement of students with autism in the general education setting. There were two instances where teachers selected the alternate practice. When presented with the option of "require a response" or "allow a student not to respond", 46.5% of the teachers thought it would be best to

allow a student not to respond; 14.0% selected the inclusive practice of “require a response”; and 39.5% left the item blank. Communication disorder is one of the triad of characteristics of autism (APA, 2013; Gernsbacher et al., 2005; Huang & Wheeler, 2006; Hussin et al., 2008; McKeon et al., 2013; Park & Chitiyo, 2011; Safe et al., 2012; Tidmarsh & Volkmar, 2003). Heflin and Alaimo (2007) describe the act of requiring a response as a means to repair the breakdown of communication in the language development of a student with autism. Rather than allowing a student with autism to pass, requiring a response will enhance communication development (Heflin & Alaimo, 2007). It is most beneficial for the student with autism when the teacher pauses and waits for the student to provide their own repair to the communication breakdown rather than providing it for the student (Heflin & Alaimo, 2007).

In order to maintain student focus, respondents were asked which technique would be most beneficial for students with autism: “provide students with a sensory tool (hand fidget, tactile cushion, quiet fidget band for feet, etc.)” or “provide structured breaks in the instructional period for students to re-focus”. Approximately two in 10 (20.9%) of the respondents selected the option of the sensory tool; 41.9% selected the alternate practice; and, 37.2% left the item unanswered. As Goodman and Williams (2007) discuss, the most important environmental aspect to address when educating a student with autism is the specific student. The student may require the use of a sensory device to incorporate appropriate movement and sensory processing into their physical environment (Goodman & Williams, 2007; Heflin & Alaimo, 2007). Creating an environment in which the student can focus on the academic task at hand provides students with autism the critical foundation necessary for engagement in the content (CAST, 2015). While structured breaks can be helpful, instructors must be mindful of strategies a student can use in their transition to higher learning (McKeon et al., 2013).

The data was then examined for group differences in the two areas where the majority of the teachers did not identify the inclusive classroom practice – require a response and provide a sensory tool. Group differences were analyzed for those with and without an ESL Endorsement, years of teaching experience, and earning an advanced degree. The number of participants in each group is displayed in Table 11.

Table 11

N-Size for Examination of Group Differences

	Group	**Number of Participants**
Endorsement	ESL Endorsed	16
	Not ESL Endorsed	25
Teaching Experience	1 – 12 Years of Experience	21
	13 – 40 Years of Experience	19
Advanced Degrees	Holds and Advanced Degree	19
	Bachelor's Degree	24
Level of Students Taught	Primary (Grades 1-3)	25
	Upper Elementary (Grades 4-6)	16

The sample size for this survey was small (n = 43), with not all participants answering every question. This hindered quantitative analysis. Small sample sizes limit data analysis to the investigation of larger differences between measures and restricts the ability to find significant relationships in the data (Sauro, 2013; University of Southern California, 2017). Data obtained were incompatible with the underlying assumptions required to run several statistical tests. The Mann-Whitney U tests nonparametric data to determine if there are differences between two

groups when the dependent variable is ordinal in nature (Laerd, 2015; Tanner, 2012). In all eight tests, the distribution of responses across groups did not differ enough to yield analysis with the Mann-Whitney U. There was not sufficient data in all cells to compute the Chi-square to determine if there was a relationship between the groups when examining each of the instructional practices (Laerd, 2015). Because several of the cells in the Chi-square had a frequency of five or fewer, Fisher's Exact Test was run. In all eight tests, the difference between groups was not statistically significant at $p < .05$. While it is possible that the difference between groups was due to chance, small sample sizes also make it difficult to establish statistical significance (Sauro, 2014). The results of these eight tests are provided in Appendix J.

Results for Research Question 3: Use of Autism-Specific Teaching Strategies

In the previous research question, respondents demonstrated an understanding of instructional strategies beneficial to students with autism in the general education setting. Research has documented the prevalence of students who have a diagnosis of autism but do not qualify for special education services in the educational setting (Finke et al., 2009; Loiacono & Valenti, 2010; Moores-Abdool, 2010; Pinborough-Zimmerman et al., 2012). It is also increasingly likely there are a high number of children who are on the autism spectrum and never identified by a health care provider or the educational system as a child with autism (Russell et al., 2010). The third, and final, research question asked: To what extent do general education elementary teachers employ autism-specific teaching strategies? In order the explore this question, teachers were asked to identify the frequency with which they employ specific practices related to content acquisition and social acceptance. Of the 12 instructional practices presented, the majority of participants reported using the strategy "always" or "often" 91.7% of the time. The one area in which respondents did not use the instructional practice presented was the use of purposeful sensory tools. Respondents were asked to indicate the frequency with

which they use the specified practice. The choices presented were: (1) Never – I do not do this; (2) Rarely – I do this once a month or less; (3) Seldom – I do this about once a month; (4) Often – I do this about once a week; and, (5) Always – This is part of our daily routine. For reporting purposes, “always” and “often” were combined, as were “seldom” and “rarely”. Distinction was made between “never” and those who chose not to answer the item. Frequencies of the Likert scale items were generated. Those frequencies were then represented as percentages of the survey responses. Table 12 presents the survey responses of the self-report use of practices.

Table 12

Frequency of Use of Specific Instructional Practices

Instructional Practice	Often/ Always	Seldom/ Rarely	Never	Blank
Direct, whole class, social skill instruction	65.1%	16.3%	2.3%	16.3%
Assign roles when working with peers	67.4%	11.6%	4.7%	16.3%
Specific classroom rules and consequences	83.7%	0.0%	0.0%	16.3%
Predictable daily routines	81.4%	2.3%	0%	16.3%
Materials on classroom walls support acquisition of current learning objectives	74.4%	4.7%	0.0%	20.9%
Purposeful sensory tools provided	20.9%	23.3%	34.9%	20.9%
Visual schedules/timetable	72.1%	7.0%	2.3%	18.6%
Learning objectives at the start and end instruction	72.1%	7.0%	2.3%	18.6%
Students are required to respond to academic prompts	74.4%	4.7%	2.3%	18.6%
Student-size replicas of class-size support materials	67.4%	9.3%	4.7%	18.6%
Students see and hear all content	67.4%	9.3%	4.7%	18.6%
Large tasks are broken into small components	76.7%	4.7%	0.0%	18.6%

In only one instructional practice of the 12 – use of purposeful sensory tools – was the practice not identified as being used “always” or “often” the majority of the time. The data was then examined for group differences with respect to providing students with a sensory tool. Group differences were analyzed for those with and without an ESL Endorsement, years of teaching experience, and earning an advanced degree. The sample size for this survey was small (n = 43), with not all participants answering all questions. Small sample sizes limit data analysis

to the investigation of larger differences between measures and restricts the ability to find significant relationships in the data (Sauro, 2013; University of Southern California, 2017). Data obtained were incompatible with the underlying assumptions required to run several statistical tests. The Mann-Whitney U tests nonparametric data to determine if there are differences between two groups when the dependent variable is ordinal in nature (Laerd, 2015; Tanner, 2012). In all eight tests, the distribution of responses across groups did not differ enough to yield analysis with the Mann-Whitney U. The Likert-scale data was transformed into dichotomous data to evaluate the chi-square test of homogeneity. There was not sufficient data in all cells to compute the Chi-square to determine if there was a relationship between the groups when examining each of the instructional practices (Laerd, 2015). Because several of the cells in the Chi-square had a frequency of five or fewer, Fisher's Exact Test was run. All four of the tests for group differences yielded results that were not significant at $p < .05$. While it is possible that the difference between groups was due to chance, small sample sizes also make it difficult to establish statistical significance (Sauro, 2014). The results of these four tests are provided in Appendix K.

These practices included in the survey were derived from research discussing elements of instructional practice beneficial to students with autism, and meet the criteria for curriculum, instruction, and environment in UDL (CAST, 2011; CAST, 2014; Heflin & Alaimo, 2007; Higginson & Chatfield, 2012; Lee & Picanco, 2013; McKeon et al., 2003). There were three items of overlap between Part II and Part IV of the survey – cooperative learning, sensory tools, and response to academic prompts. In the area of cooperative learning, 41.9% of respondents identified "cooperative learning groups with roles for each student" as the most effective practice for students with autism when compared to "individual student practice". Consistent with the

ability to identify the most effective practice, 67.4% of the respondents reported assigning roles when working with peers “always” or “often”.

Teachers reported using purposeful sensory tools “always” or “often” 20.9% of the time. The same percentage of respondents left the item blank. Many of the respondents, 34.9%, never use purposeful sensory tools. This is consistent with the results in Part IV of the survey where 20.9% of the teachers identified “provide students with a sensory tool” as an effective instructional practice for students with autism and 41.9% selected the alternative response of providing structured breaks in the instructional period of students to re-focus. As Content Validity Expert 5 explained, dysregulation often accounts for non-preferred behavior and difficulties with learning. By focusing on understanding the sensory dysfunction, Content Validity Expert 5 continued, the appropriate sensory tools can be provided to the student. Sensory tools incorporate appropriate movement and sensory processing into a student’s physical environment (Goodman & Williams, 2007; Heflin & Alaimo, 2007). Creating an environment in which the student can focus on the academic task at hand provides students with autism the critical foundation necessary for engagement in the content (CAST, 2015).

When asked if a response to an academic task is required from a student, 74.4% of the respondents reported they “always” or “often” require a response. Only 2.3% never require a response. However, when asked to select the most effective instructional practice for students with autism, 14.0% selected the option to require a response when paired against allowing a student not to respond (46.5%). In the general education setting, Goodman and Williams (2007) identify inclusive social practices as those which require a student with autism to respond to academic and social prompts, encourage a student to make choices, and facilitate friendships. These social skills are necessary for successful participation in college and careers (McKeon et al., 2013).

The quantitative data demonstrated the participants were using 11 of the 12 (91.7%) autism-specific instructional practices the majority of the time, but the qualitative data revealed that the teachers are not confident about their skill set for teaching students with autism. Twenty-three of the 43 participants (53.5%) responded to the questions asking for a description of their skill set for teaching students with autism and how it was acquired. The coding of the open-ended responses narrowed text segments to identify broad themes (Creswell, 2014; Marshall & Rossman, 2016). Frequently occurring themes were tallied (Creswell, 2014; Marshall & Rossman, 2016; Miles & Humberman, 1994). Table 13 presents teacher responses detailing how they describe and/or acquired their skill set for teaching students with autism.

Table 13

Codes Derived from Question about Skill Set

Code	**Frequency**
On the job experience	12
Inadequate skill set	11
Taking classes/self-study	5
Working with parents of student with autism	4
District/School Special Education staff	3
Family Member has autism	3
Teaching partner or mentor	1

Eleven (47.8%) of the 23 teachers that responded felt they had an inadequate skill set for teaching students with autism. No teachers overtly expressed confidence. The remaining themes generated from coding the responses addressed how participants acquired their skill set. Many

teachers (30.8%) have acquired their skill set through previous experience teaching students with autism in the classroom. The coding of qualitative responses detailed the other ways in which teachers have acquired their skill set as it pertains to teaching students with autism in the general education setting:

- taking continuing education classes/engaging in self-study (12.8%);
- working closely with the parent of the student with autism (10.3%);
- assistance from district or school Special Education staff (7.7%);
- a family member has been diagnosed with autism (7.7%); and,
- by asking a colleague or mentor (2.6%).

The representation of autism as a spectrum disorder was articulated through referring to trial and error because "no two autistic students have been the same" and, "what works for [one] autistic student does not always work for another autistic student".

Conclusion

This chapter summarized the survey data regarding rates of students with autism in the general education classroom, the extent to which general education teacher identify the inclusive classroom practices effective for students with autism, and the implementation of autism-specific teaching strategies. When asked to consider only those students who received services through and IEP or 504, teachers reported 35% of these students were identified as having autism. Of the students not identified, 6.54%, or 1.83 students per classroom were identified by the teacher as having significant learning differences and not currently identified or receiving services through an IEP or 504. General education teachers predominately reported students with significant learning differences were best served in the general education setting, but felt additional

resources and support were necessary for the general education teacher to meet the needs of the variety of learners in their classroom.

Respondents reported they regularly make special accommodations for students. While some of those accommodations were necessitated by an IEP or 504, the teachers reported providing accommodations for academic differentiation, because of student behavior, in response to a parent request, or in the event of a change in school schedule or personnel. Within the school day, respondents reported a wide variety of ways in which adjustments were made to the normal routine. The largest category of adjustments facilitated content acquisition for students. Multiple teachers reported providing accommodations or modifications to assignments, change seating to reduce distractions, and allow more time. Teachers also reported making changes to the classroom routine to address student behavior. The least time-intensive of these actions were proximity and providing a sensory tool. More intensive actions on the part of the teacher were behavior contracts, incentives, and on-task reminders.

One participant, whose knowledge and skills for teaching students with autism originated from the diagnosis of an immediate family member, hit on principles of Universal Design for Learning (UDL) with the response, “I find the routine is crucial for autistic students. It has been my experience that a posted schedule, scheduled breaks and recesses, and warnings for changes in activities help all students.” Qualitative data from this chapter is used in Chapter 5 to discuss how the elements of the theoretical framework of UDL can create an instructional environment in which the instructional needs of students with autism are addressed without creating a separate instructional plan for one or two students in the classroom.

Chapter V

Discussion

Introduction

Today's general education elementary school classroom teacher has a wide variety of learners in the classroom. Autism Spectrum Disorder (ASD), or autism, has become a part of the national narrative. Whether people recognize it when they see it or not, television and motion pictures draw the attention of a broader audience to individuals with autism (Autism Research Institute, 2015; Furlong, 2013; Kurchak, 2013; Neeley-Barnes et al., 2011). As awareness and acceptance of autism in society increases, so does the understanding of autism as a spectrum disorder in which the impairments associated with the disability may either manifest profoundly or be nearly invisible (Baker, 2002; MacDonald, 2010). Although identified through special education procedures, students with autism spend a great deal of their educational programming in the general education classroom (Finke et al., 2009; Loiacono & Valenti, 2010; Moores-Abdool, 2010; Pinborough-Zimmerman et al., 2012). In Utah, where this study was conducted, 38% of the elementary students, ages six to 11, who were classified under the category of autism for special education reporting purposes remain in a general education classroom setting 80% or more of the school day (USBE, 2015b). An additional 19% of the same population of students were in their general education classroom 40% to 79% of the school day (USBE, 2015b). General education teachers also encounter students who have a diagnosis of autism but do not qualify for special education services in the educational setting (Finke et al., 2009; Loiacono & Valenti, 2010; Moores-Abdool, 2010; Pinborough-Zimmerman et al., 2012). It is increasingly likely there are a high number of children who are on the autism spectrum and never identified by a health care provider or the educational system as a child with autism (Russell et al., 2010).

Recent studies suggest 55% to 66% of the school-age undiagnosed population had autism-like characteristics at the same rate of those who had been diagnosed with autism or were receiving educational support for a diagnosis of autism (Kim et al, 2011; Russell et al., 2010). General education teachers must address many different circumstances in the classroom. Differences in learning style, cultural, socio-economic status, level of proficiency with the English language, students with disabilities, and students with health needs are just the beginning of an infinite list of possibilities. It is not feasible to instruct every student individually. It is also not feasible to implement different programs for each broad classification of student. Additionally, students do not fall into unique instructional groups. The challenge, then, is to create a universal learning environment appealing to each participant (Jiménez et al., 2007; Lee & Picanco, 2013).

This research investigated multiple aspects of autism and the general education setting in the elementary school environment. Three distinct elements were examined: rates of autism in the general education setting, the extent to which general education teachers recognize inclusive practices specific to students with autism, and the extent to which general education teachers employ inclusive practices in their classroom. To investigate each aspect, three primary research questions were posed:

1. In a general elementary education classroom, how does the rate of students with autism or multiple characteristics of autism compare to the state reporting rates of autism?
2. To what extent are general elementary education teachers able to identify the elements of an inclusive general education classroom that research has found to benefit students with autism?

3. To what extent do general elementary education teachers employ autism-specific teaching strategies?

Chapter V discusses the data associated with the research questions through the lens of the theoretical framework.

Summary of Results

Data from the Centers for Disease Control and Prevention (CDC) report one in every 68 children (1.47%) have been diagnosed with autism (Baio, 2014; Christensen et al., 2012). The percentage of students with a diagnosis of autism and being served under an IEP or 504 in this study was 1.26%, comparable to the CDC rate (Baio, 2014). In Utah, where this study was conducted, 38% of the elementary students, ages six to 11, who were classified under the category of autism for special education reporting purposes remained in a general education classroom setting 80% or more of the school day (USBE, 2015b). In this study, 35% of the students who have been identified and were receiving services through an IEP or 504 were identified as having autism.

Respondents had little trouble in selecting the practice most effective for social and academic achievement of students with autism in the general education setting, selecting the most effective practice 80% of the time. Of the 10 sets of instructional practices presented, there were two instances where teachers selected the alternate practice. In the area of student response to an academic prompt, 46.5% of the teachers selected the alternate practice of allowing a student not to respond, yet 74.4% of the respondents reported they “always” or “often” require a response. Respondents also favored the alternate practice of providing structured breaks during the instructional period over providing students with a fidget tool by 21%. Consistent with not selecting the use of sensory tools and the most effective practice for students with autism, only

20.9% of respondents reported using sensory tools “always” or “often”. Many of the teachers responding, 34.9%, reported never using purposeful sensory tools.

Creating an environment in which the student can focus on the academic task at hand provides students with autism the critical foundation necessary for engagement in the content (CAST, 2015). Heflin and Alaimo (2007), identify opportunities to respond to academic prompts as critical to maintaining engagement in learning for a student with autism. Rather than allowing a student with autism to pass, requiring a response will enhance communication development (Heflin & Alaimo, 2007). Heflin & Alaimo (2007) recommend the teacher pause and wait for the student to provide their own response rather than allowing a pass or providing the response for the student. Sensory tools address sensory processing needs in a student’s physical environment, which frees other process to actively engage in the academic content (Goodman & Williams, 2007; Heflin & Alaimo, 2007). While structured breaks can be helpful, instructors must be mindful of strategies a student can use in their transition to higher learning (McKeon et al., 2013).

Return to Theoretical Framework

The research methodology of this study was a quantitative survey complimented by qualitative data (Jensen, 2002). The results of the data analysis can now be combined with the theoretical framework to solidify the legitimacy of the study (Jensen, 2002). While the quantitative research generally demonstrated teachers were able to identify effective practices for students with autism and implement effective strategies on a regular basis, the qualitative data revealed broad themes of frustration and inadequacy. The theoretical framework of Universal Design for Learning (UDL) and Accommodating Diversity by Analyzing Practices of Teaching (ADAPT) may be able to mitigate some of the inconsistencies found in the quantitative data (CAST, 2013; Lee & Picanco, 2013). Participating content validity experts were given the

opportunity to comment on the instructional strategies presented in the survey. Content Validity Expert 10 noted, "…a lot of the responses would work well for many populations … I think you have hit upon some principles of UDL here."

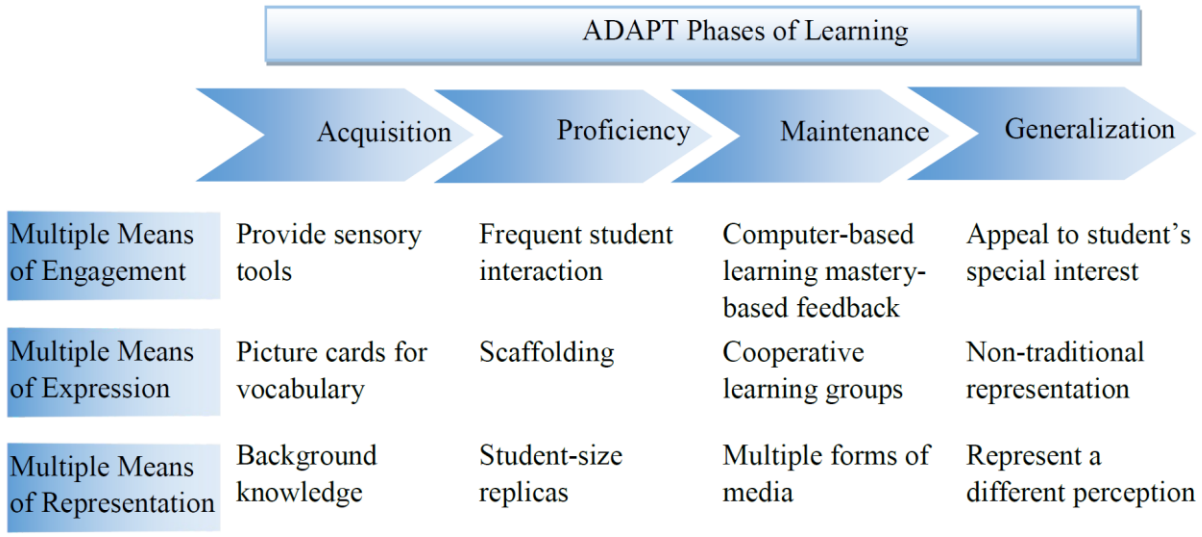
ADAPT was used to narrow the central tenets of UDL to form the theoretical framework for this study (CAST, 2013; Lee & Picanco, 2013). UDL was developed as a means to provide access to the intended curriculum and learning opportunities in the general education setting for all learners (CAST, 2015). UDL is intended to serve as framework to accommodate curriculum acquisition in a manner accessible for all students (Brand et al., 2012; CAST, 2015; Denning & Moody, 2013; Edyburn, 2010; Heflin & Alimo, 2007; Hitchcock et al., 2002; Jiménez et al., 2007; McGhie-Richmond & Sung, 2013; McGuire et al., 2006). By selecting the instructional technique appropriate to the phase in student learning, teachers create a more efficient path to mastery and reduce cognitive dissonance associated with applying the wrong strategy for the phase of learning (Lee & Picanco, 2013).

The two inconsistencies in the participants' ability to identify effective instructional practice and the frequency of use of effective instructional practices were in the areas of student response and sensory tools. Requiring a student to respond to an academic prompt provides an excellent opportunity to apply the theoretical framework to a specific construct. Responding to an academic prompt is an element of communication and, in some cases, social interaction. Communication disorder is one of the triad of characteristics of autism (APA, 2013; Gernsbacher et al., 2005; Huang & Wheeler, 2006; Hussin et al., 2008; McKeon et al., 2013; Park & Chitiyo, 2011; Safe et al., 2012; Tidmarsh & Volkmar, 2003). Impairment in social interaction is a second aspect of the triad of characteristics of autism (APA, 2013; Gernsbacher et al., 2005; Huang & Wheeler, 2006; Hussin et al., 2008; McKeon et al., 2013; Park & Chitiyo, 2011; Safe et al., 2012; Tidmarsh & Volkmar, 2003). It is critically important that the academic setting is

constructed in such a way that encourages a student to surpass limitations imposed by the impairment. Figure 6 combines the ADAPT phases of learning with the principles of UDL to require a student to respond to an academic prompt in the context of a student with autism (CAST, 2013; Lee & Picanco, 2013).

Figure 6

UDL Principles and Phases of Learning in Requiring a Student Response



Engagement, meaning the amount of time students spend in the active participation of learning is critical to the acquisition of knowledge, skills, and understanding (Heflin & Alaimo, 2007). Providing choice when possible, providing relevance and context, and creating a safe and inviting learning environment are all ways in which educators can create engagement (CAST, 2011; CAST, 2014). During the acquisition and proficiency phase, a teacher can provide multiple means of engagement by creating an environment in which students self-regulate (CAST, 2011; CAST, 2014). One means of engagement in the acquisition phase of learning is to provide students with sensory tools. Sensory tools give students a socially acceptable option to self-regulate; in turn, this facilitates the development of coping strategies (CAST, 2011; CAST,

2014; Goodman & Williams, 2007; Heflin & Alaimo, 2007). During the proficiency phase of learning, engagement could be addressed through student self-assessment, self-management, and reflection (CAST, 2011; CAST, 2014; Heflin & Alaimo, 2007). Frequent student interaction – student to student and teacher to student – is another engagement technique appropriate to the proficiency phase of learning (Echevarria et al., 2008; Heflin & Alaimo, 2007). Student engagement during the mastery phase of learning is oriented to sustained effort and persistence (CAST, 2011; CAST, 2014). A teacher, for example, may increase mastery-oriented feedback by utilizing computer assisted instruction (CAST, 2011; CAST, 2014; Heflin & Alaimo, 2007). The goal of student engagement during the generalization phase of learning is to develop recurring interest (CAST, 2011; CAST, 2014). To do so, the teacher should capitalize on the student's special interests within the content objective being studied (Bevan-Brown, 2010; Safran, 2002). A more purposeful and motivated learner is nurtured when the educational setting considers multiple means of promoting student engagement during the phases of learning (CAST, 2011; CAST, 2014).

Multiple means of expression are adopted when educators allow students to construct, compose, and communicate in multiple ways and provide students with opportunities to interact with multiple forms of media (CAST, 2011; CAST, 2014; Griffin, et al., 2013; Hitchcock et al., 2002). In the acquisition phase of learning, a teacher who addresses the executive functioning required for the content objective is opening the path to multiple means of expression (CAST, 2011; CAST, 2014). Instructional strategies such as activating or providing background knowledge and building vocabulary are key strategies for expression in the acquisition phase of learning (Echevarria et al., 2008; Heflin & Alaimo, 2007). At the proficiency phase of learning, the teacher could allow for expression and communication (CAST, 2011; CAST, 2014). In this phase, scaffolding the curriculum information and behavior expectations is a technique to

encourage expression for a learner (Brand et al., 2012; CAST, 2011; CAST, 2014; Echevarria et al., 2008). At the maintenance phase of learning, teachers can allow for expression and communication (CAST, 2011; CAST, 2014) within the content objective. One example of an instructional strategy to use in the maintenance phase is to incorporate cooperative learning groups to respond to a multi-step or complex task related to the content objective (Heflin & Alaimo, 2007). Multiple means of expression during the generalization phase requires students to produce an alternate method of demonstrating knowledge of the learning objective (CAST, 2011; CAST, 2014). This is an area where teachers might choose to play to the strength of a student with autism as suggested by Bevan-Brown (2010) and Safran (2002). Or, the teacher may challenge the student with autism to stretch out of their comfort zone and incorporate a secondary method into their strength in order to demonstrate generalization (CAST, 2011; CAST, 2014; Heflin & Alaimo, 2007). Across all phases of learning, educators can facilitate executive functioning by helping students to set goals, manage large amounts of information, and monitor completion of long-term or on-going projects (CAST, 2011; CAST, 2014; McKeon et al., 2013). When multiple means of expression are provided to students, they become more strategic learners (CAST, 2011; CAST, 2014).

A teacher allows for multiple means of representation by allowing for a variety of student response methods or incorporating available assistive technology as appropriate (CAST, 2011; CAST, 2014; Mintz, 2013; Strobel et al., 2007). In the acquisition phase of learning this could include providing options for comprehension by activating background knowledge, providing background knowledge, or building vocabulary necessary to understand the academic learning objective (CAST, 2011; CAST, 2014; Echevarria et al., 2008; Heflin & Alaimo, 2007). In the proficiency phase of learning, a teacher can address multiple means of representation by providing student-size replicas of instructional materials (Heflin & Aliamo, 2007). To promote

the maintenance of learning, a teacher may consider providing options for language expression, mathematical expressions, and symbols (CAST, 2011; CAST, 2014). Content objectives could be illustrated through multiple media (CAST, 2011; CAST, 2014). Or, the teacher could include visual supports to compensate for students with auditory processing deficits (Heflin & Alaimo, 2007). To facilitate generalization of learning through multiple means of representation a teacher could provide students with options to represent different perception (CAST, 2011; CAST, 2014). When a teacher provides multiple means of representation of the curriculum, students emerge from the instructional setting as more resourceful and knowledgeable learners (CAST, 2011; CAST, 2014).

The example above demonstrates how an instructor can implement UDL across the phases of learning in ADAPT to facilitate student responses to academic prompts. Two of the content validity experts volunteered comments stressing the importance of requiring a response from students with autism. Content Validity Expert 4 stated, "Having high expectations of our students with autism is essential, but proving them with alternate ways of responding is going to support their way of learning." Echoing the importance of high expectations, Content Validity Expert 5 noted while a teacher cannot force a student to respond, "I don't believe you should allow students to never respond. … Teachers should be providing opportunities and reinforcing responses for students who have a difficult time responding."

Conclusion

This research was directed toward examining the rates of students with autism in the general education setting and the instructional environment of the same classrooms. The rate of students who receive services through an IEP or 504 and are identified as having autism is consistent with the CDC reporting rate of autism in the United States. Additionally, teachers are generally able to identify effective instructional practices for students with autism and report the

routine use of effective instructional practices. The unintended discovery was the teacher perspectives describing the enormity of the task of educating students with significant learning difficulties in the general education setting. It may be best described in the words of a participant who said:

> I currently have a student who has been diagnosed with autism spectrum disorder who is not receiving services through IEP or 504. Just one student has disrupted my instruction daily in nearly all subjects. I feel frustrated that I am unable to find his triggers so that we can avoid outbursts that require evacuating the room and having him removed. The other students are stressed and I am unable to complete a lesson. My instruction time has had to be shortened dramatically, instruction itself has had to be increasingly active (not necessarily a bad thing, but difficult to accomplish for EVERY lesson), and other students are frustrated with the pace and lack of progress we are making.

While some teachers, usually those with several years of experience, felt adequately prepared to address the needs of students with autism. Nearly all the comments teachers provided about practice were reactive in nature. Examples of reactive techniques include: responding to a behavior, adjusting for a lack of understanding, or implementing an accommodation as directed by an IEP or 504. Rather than reacting to variables in the classroom, UDL promotes designing curriculum to address neurological variability in learners, and ADAPT can implement the design across the phases of learning (CAST, 2013; Lee & Picanco, 2013). UDL emphasizes dynamic curriculum design as opposed to responding to individual student needs as they are presented (CAST, 2013).

Recommendations for Further Research

The first recommendation is replicate the quantitative research in the study in urban, suburban, and rural schools in several states with a large quantity of participants. This would

allow for examination of group differences and generalization within the public education setting. A separate qualitative study should be conducted parallel to a quantitative exploration of the general education setting for students with autism. The qualitative research, in the form of a case study, could further explore teacher knowledge, ability, and attitudes with respect to students with autism or significant learning differences in the general education setting (Creswell, 2014; Marshall & Rossman, 2016).

Further research is needed to evaluate the percentage of students with autism in the general education setting for 80% or more of their school day. This study collected, for a small sample size, data identifying the number of students served through an IEP or 504 with a diagnosis of autism, but could not collect information regarding the undiagnosed rate of students with autism in the general education setting. Estimations of the undiagnosed rate of autism vary widely (Kim et al, 2011; Pinborough-Zimmerman et al., 2012; Russell et al., 2010). General education classroom teachers would benefit from knowing the prevalence percentages of autism – diagnosed and undiagnosed – in the population to better plan for and prepare to meet the needs of students in their classroom. Interestingly, there were two dual-language immersion schools in the sample for this study. Based on comments from participants who teach in an immersion school, additional research on the characteristics of classrooms in dual immersions schools is suggested. Specifically, research should include if provisions are made for the equal access to educational opportunities for all students in dual immersion schools; classroom demographics are equally representative; and, whether or not students with disabilities are provided a free and appropriate public education in a language immersion experience. Embedded research in one school of significant size would facilitate tremendous data collection. Future research could survey and interview parents of students in the school; observe student characteristics in the

classroom setting; access IEP and 504 data; and, observe and interview general education teachers.

While teachers correctly identified 80% of the instructional practices effective in the general education setting for students with autism, 47.8% of the teachers identified their skill set in teaching students with autism as inadequate or nonexistent. Additional research is necessary into both pre-service and in-service professional development of teachers as it relates to the instruction of special populations – including students with autism – in the general education setting. As teachers are exposed to instructional strategies effective for students with autism and informed of how these strategies develop learners who are more knowledgeable, resourceful, motivated, purposeful, strategic, and goal directed, the teacher will be motivated to implement the strategies in the general education setting (CAST, 2011; CAST, 2014).

Finally, teachers in this study reported using strategies effective for students with autism 91.7% of the time. However, additional research is necessary to measure fidelity and consistency to the implementation and use of instructional strategies. In a self-report measure, researchers have no way of controlling for over- or under-reporting the use of an instructional strategy by a participant (Creswell, 2014). To truly obtain an accurate representation of instructional practices in general education classrooms, self-report measures should be followed by observation of practices in the same classroom.

Implications for Professional Practice

Students diagnosed with autism do not necessarily require special education or related services (Goodman & Williams, 2007; Higginson & Chatfield, 2012; Pinborough-Zimmerman et al., 2012). In two different state-specific studies, researchers estimated 20 to 50 percent of children diagnosed with autism did not receive special education services of any kind (Pinborough-Zimmerman et al., 2012. p. 525; Stanford & Reeves, 2009). Moreover, emerging

research suggests an undiagnosed rate of students on the autism spectrum as high as 55% in some elementary school settings (Russell et al., 2010). Therefore, the general education teacher can expect to have multiple students in class on a regular basis who are diagnosed with autism but not receiving services as well as students who exhibit multiple characteristics of autism but do not have a formal diagnosis (Finke et al., 2009). It is increasingly important for general education teachers to create a classroom environment beneficial to all learners while addressing the triad of impairments associated with autism.

As teachers work to address the needs of all learners, they are increasingly presented with singular instructional programs. Echevarria, Vogt, and Short (2008) provide a robust model for meeting the needs of English Language Learners in the general education setting. Culturally responsive teaching promotes cross-cultural instructional practices with an eye toward justice and equity in society (Vavrus, 2008; Wlodkowski & Ginsberg, 1995). Rather than creating pedagogy to address unique circumstances, practitioners must seek to approach their work in a way that designs instruction to meet the needs of all learners (CAST, 2011; CAST, 2014; Jiménez et al., 2007).

There is a vast opportunity for professional development and growth when it comes to meeting the needs of students with autism in the general education setting. The first opportunity can be found in pre-service education. When asked to describe their skill set, and how it was acquired, in teaching students with autism one participant stated:

> I was never prepared in my formal education for dealing with the diverse students on the autism spectrum. The only training I have received is 2 inservice presentations in faculty setting, suggestions from special ed trained teachers, and my own independent reading and study. However, there is such a huge range of proficiencies and behaviors within the

> autism spectrum, I feel very ill-prepared to deal [effectively] with these students in a classroom setting.

Teachers genuinely believe the general education setting is the ideal setting for most students, but feel ill-equipped to meet the needs of students with significant learning differences. When asked how they would design the ideal learning environment, most answers were framed within the general education setting. Participants only suggested a more restrictive environment in the rare exception. A veteran teacher described that rare exception like this:

> For 90 percent of students with learning disabilities, the regular classroom is ideal. After teaching for 25 years I have an extensive toolbox of behavior modification, lesson differentiation, and classroom modifications. However, over the course of my career, and this year specifically, there are a few students who struggle tremendously in a regular classroom, cause disruption for the other students, and are not given the best opportunity to succeed in a regular classroom. Those few students need a specially trained teacher, multiple aides, and a greatly modified curriculum that best serves them. I think that the best instructional environment would be highly structured with lots of adult support and supervision.

Policy makers should also consider the overwhelming request for additional support in the form of teacher assistants and smaller class sizes. Less offered requests were in the form of continuing education and access to experts with knowledge of best practice to coach and mentor general education teachers in meeting the needs of students with autism.

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Appendix A

Changes in Diagnostic Criteria of Autism

DSM III (APA, 1980)

- Symptoms appear prior to 30 months of age
- Frequently unresponsive to others
- Substantial impairment in language development
- Particular speech patterns
- Unexpected responses to the environment
- Systems are not explained by mental disorders

DSM-IV (APA, 1994)

- Overall diagnosis is not better described by Rett's disorder or any childhood disintegrative disorders.
- At least six symptoms from three different categories with at least two of the impairments falling under social interaction:

1. Social Interaction:
    - significant impairment in the use nonverbal behaviors
    - lack of developed peer relationships commensurate with developmental level
    - does not exhibit the desire to participate in expressive language
2. Communication:
    - delayed in spoken language in which communication is not replaced by alternative methods
    - impairment in the ability to begin or carry on a conversation
    - expressive language lacks variation

Appendix A

Changes in Diagnostic Criteria of Autism (continued)

- does not participate in make-believe play in a way that is developmentally appropriate

3. Restricted, repetitive, and stereotyped patterns of behavior, interests, and activities:

- limited interests
- bound to specific routines
- repetitive motor patterns
- inflexible preoccupation with objects

Appendix B

Letter of Approval to Conduct Research in the Washington School District

September 21, 2016

Lori Hawthorne-Schlichting
621 Ogden Canyon
Ogden, UT 84401

Dear Lori:

Your request to conduct a research project in the [redacted] School District concerning "Students with Autism in General Education Elementary Classrooms: A Quantitative Study Discussing the Identification and Implementation of Effective Practice, Environment, and Instruction" has been given district level approval by the [redacted] School District Research Review Committee.

Although you have received Research Review Committee approval, this decision does not obligate a school or its staff to participate if circumstances or events are such that the research would create problems or would be overly burdensome. It will now be necessary for you to contact the principal of each school listed in your research proposal to obtain school-level approval. Once the principal's approval has been obtained, you may proceed with recruitment and gathering data at each of the schools as proposed in your application.

Please send a copy of your final findings, conclusions, and recommendations from the study to the Accountability and Program Services Department. Thank you for your interest in conducting research in [redacted] School District.

Sincerely,

Appendix C

Letter of Approval to Conduct Research in the Van Buren School District

September 8, 2016

Lori Hawthorne-Schlichting
Northwest Nazarene University
Nampa, Idaho

Dear Ms. Hawthorne-Schlichting:

[redacted] School District is committed to quality education and supports the efforts made by all individuals and groups who wish to improve it through research and study. As a state agency charged with the education and safety of the students who attend our school, we take a close look at the many proposals that are sent to us.

Please recognize our commitment to children and know that all decisions we make are made with them in mind. We wish you the best and hope for your success in education.

Be certain that survey participants are contacted only twice – once to introduce the study and once to remind/follow-up. This is in accordance with District research policies. Also, please make it clear to selected participants that they have the opportunity to opt-out of participation. When your project is finalized, you will need to provide the District with a digital copy.

Your project is approved __X__ Date: September 8, 2016

Your project is rejected _____ Date: _____

Continued Success,

Appendix D

Demographic Profile of Schools and Districts from Selection to Survey Administration

Location	Enrollment		Ethnic Minority		Low Income		Special Education		English Language Learner	
	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016
Utah Public School Districts	566,387	572,982	25%	25%	36%	35%	11%	11%	6%	7%
Washington School District	52,324	52,507	22%	23%	22%	24%	11%	11%	3%	4%
Van Buren School District	31,184	31,445	18%	18%	31%	30%	13%	13%	3%	3%
Adams School	746	716	28%	30%	40%	37%	11%	12%	5%	5%
Jefferson School	788	812	12%	14%	19%	18%	8%	9%	1%	2%
Madison School	747	710	33%	37%	37%	43%	11%	11%	10%	11%
Monroe School	765	722	13%	13%	26%	21%	12%	13%	1%	1%
Jackson School	712	625	15%	12%	24%	20%	10%	11%	2%	0%
Harrison School	770	752	15%	13%	23%	21%	11%	15%	3%	2%
Tyler School	786	839	19%	23%	31%	27%	12%	12%	2%	2%
Polk School	764	840	11%	12%	23%	18%	14%	14%	1%	2%
Taylor School	724	713	11%	13%	28%	24%	11%	11%	2%	2%
Fillmore School	761	675	23%	25%	40%	38%	14%	12%	3%	2%

Appendix E

Survey Instrument

Informed Consent:
You are invited to participate in a research project about students with Autism in the general education classroom. This online survey should take about 20 to 30 minutes to complete. Participation is voluntary, and responses will be kept confidential to the degree permitted by the technology being used. All information will be kept confidential and any identifying information will be withheld. Pseudonyms will be used for schools and school districts.

You have the option to not respond to any questions that you choose. Participation or nonparticipation will not impact your relationship with your employer. Submission of the survey will be interpreted as your informed consent to participate and that you affirm that you are at least 18 years of age.

There are risks and benefits in everything we do. The risks to the participants include a loss of time or a sense of frustration or discomfort. Your time is valuable, and you may elect to skip any questions you wish or end your participation at any time. You may also feel frustrated or uncomfortable as you examine your professional practices and the myriad of personalities in your classroom. However, by participating in this survey, you will help to contribute to the body of educational research in the area of autism. Specifically, your information will contribute to research investigating the participation of students with autism in general education classrooms and the instructional strategies educators are using in the classroom.

If you have any questions or concerns about the study, please contact the principal investigator, Lori Hawthorne-Schlichting, via email at lhawthorne-schlicht@nnu.edu or the faculty adviser, Dr. Bethani Studabaker at bstudebaker@nnu.edu. If you have any questions regarding your rights as a research subject, contact the NNU Human Research Review Committee at HHRC@nnu.edu.

___ I affirm I am at least 18 years of age, and agree to participate in the survey.
___ I do not wish to participate in the survey.

Appendix E

Survey Instrument (continued)

Part I

This survey is comprised into four parts. In the first section, please tell me a little bit about yourself.

First, I want to ask about where you work. This is to ensure that only responses from teachers in the school districts and schools for which I have permission to conduct the study are included in my data analysis.

In what school district do you work? ___ [redacted] ___ [redacted] ___ Other (please indicate)

In what school do you work?

___ [redacted] Elementary
___ [redacted] Elementary
___ [redacted] Elementary
___ [redacted] Elementary
___ [redacted] Elementary
___ Other (please indicate)

___ [redacted] Elementary
___ [redacted] Elementary
___ [redacted] Elementary
___ [redacted] Elementary
___ [redacted] Elementary
___ Other (please indicate)

What grade level is your current homeroom class? If you teach a split or a multi-age class, please select the lowest grade that you teach.

___ First Grade ___ Second Grade ___ Third Grade
___ Fourth Grade ___ Fifth Grade ___ Sixth Grade

What is your gender? ___ Male ___ Female ___ Prefer not to Answer

How many years have you taught? (Include this school year, and round partial years up to full years.) ____

How many years have you been at your current school? ? (Include this school year, and round partial years up to full years.) ____

If you have advanced degrees, please check the degrees you hold. (Check all that apply)
Master's Degree _____ Education Specialist _____ Doctorate _____

Below is a list of all the endorsements and license areas from the Utah State Office of Education. Please check the licenses and endorsements that appear on your professional educator's license. (Check all that apply.)

License Area of Concentration

___ Elementary K-3 ___ Elementary 1-8 ___ Secondary 6-12 ___ Special Education K-12+

Appendix E

Survey Instrument (continued)

Endorsements

___American Sign Language
___Agricultural Education
___Comprehensive Counseling and Guidance
___CTE Introduction
___Dance - Secondary
___Dual Immersion
___ Educational Technology
___ ESL
___Film – Secondary
___Gifted and Talented
___Health Science Education
___Journalism
___Keyboarding Education – Secondary
___Marketing Education
___Mathematics Level 3
___Mathematics – Elementary
___Music – Elementary
___Physical Education
___Reading Level II (Advanced)
___Skilled and Technical Sciences Education
___Special Education
___Technology and Engineering Education
___Theatre – Secondary
___Visual Arts – Secondary
___World Language
___Arts Integration/Elementary Teachers
___Business Education
___Computer Science
___Dance – Elementary
___Driver Education
___Economics & Entrepreneurship Education
___ English
___Family & Consumer Sciences Education
___General Financial Literacy
___Health
___Information Technology Education
___Keyboarding Education – Elementary
___Library Media
___Mathematics Level 2
___Mathematics Level 4
___Mathematics – Special Education
___Music – Secondary
___Reading Level I (Basic)
___Science
___Social Studies
___Speech
___Theatre – Elementary
___Visual Arts – Elementary
___Work-Based Learning
___Administration

Appendix E

Survey Instrument (continued)

Part II

This part is of the survey is about the instructional practices that you use on a regular basis for all students. For the following instructional practices, please indicate the frequency at which you use the specified practice.

- Never – I do not do this
- Rarely – I do this once a month or less
- Seldom – I do this about once a month
- Often – I do this about once a week
- Always – This is part of our daily routine

	Never	Rarely	Seldom	Often	Always
Direct, whole class, social skills instruction					
Assign roles when working with peers					
Specific classroom rules and consequences that are posted, reviewed, and understood					
Predictable daily routines					
Materials on classroom walls support acquisition of current learning objectives					
Purposeful sensory tools (hand fidget, tactile cushion, quiet fidget band for feet, etc.) provided					
Visual Schedules/timetable					
Learning objectives explained at the start and reviewed at the end of each instructional event					
Students are required to respond to academic prompts					
Student-size replicas of class-size support materials (number line, hundreds chart, alphabet, calendar, etc.) are provided					
Students see and hear all content					
Large tasks are broken into small components to be completed in succession					

When you go out of your normal routine to make special accommodations for students, what do you feel necessitates the change in routine and what might it look like?

Appendix E

Survey Instrument (continued)

Part III

Part III of the study asks questions about the students in your homeroom class. If your grade level or team rotates students for subjects or ability group, please answer these questions with the students in mind for whom you are the **primary teacher**. If you teach a split or a multi-age class, please answer these questions with the students in mind for whom you are the **primary teacher**.

How many students are in your class? ___
Of the total number of students in your class, how many receive Special Education services? ___
Of the total number of students in your class, how many have a 504 Plan? _____

Now, I would like you to think about just students who have been identified and are receiving services through an IEP or 504 are identified as having autism? ___

Finally, think about the following characteristics of significant learning differences:

- distracted/disorganized/lack of impulse control
- lack of developmentally appropriate social language skills
- strict adherence to routine
- repetitive behaviors
- persistent preoccupation with specific people/objects/events
- does not use or understand non-verbal behaviors such as eye contact, facial expressions, or body language
- difficulty with transitions
- heightened or unusual response to sound/texture/smell/lights

Of your students who are **not** identified or receiving services through an IEP or 504, how many students exhibit **three or more** of the above characteristics in a way that detracts from their social or academic competency and sets them apart from their peers? Only include students who exhibit the characteristics regularly (daily) or routinely (every time a particular situation occurs). If you have difficulty with this question, click here for an example of how to compute your answer. ___

From your perspective as a classroom teacher, how do you feel students with significant learning differences listed above impact the efficient delivery of the general education content standards in your classroom?

In an ideal situation, how would you structure the educational environment for students with significant learning differences?

Appendix E

Survey Instrument (continued)

Hyper link to example of how to compute the last question of Part III.

Student	distracted/disorganized/ lack of impulse control	lack of developmentally appropriate social language skills	strict adherence to routine	repetitive behaviors	persistent preoccupation with specific people/objects/events	does not use or understand non-verbal behaviors such as eye contact, facial expressions, or body language	difficulty with transitions	heightened or unusual response to sound/texture/smell/lights	Number of "Yes"	Diagnosis of Autism?	Count?
Student A	No	No	Yes	Yes	Yes (hot wheels)	Yes	Yes	Yes	6	No	Yes
Student B	Yes	No	No	No	No	No	No	No	1	No	No
Student C	No	No	No	No	No	No	No	No	0	No	No
Student D	No	No	No	No	No	No	No	No	0	No	No
Student E	No	No	No	No	No	No	No	No	0	No	No
Student F	No	No	No	No	No	No	No	No	0	No	No
Student G	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	7	Yes	No
										Total	1

Appendix E

Survey Instrument (continued)

Part IV

For the final part of this survey, take a few minutes to think about what you already know regarding students with autism. For each set, choose the item that, in your experience, is most effective for social and academic achievement of students with autism in the general education setting.

___Delayed or unpredictable reinforcement	___Regular or predictable reinforcement
___Require a response	___Allow a student not to respond
___Cooperative learning groups with roles for each student	___Individual independent practice
___Appeal to student's unique interests	___Require student to search for new interests
___Alert students to the time remaining for a specific task or activity	___ Allow students to continue working on a task or activity without interruption and announce when the allocated time has expired
___Vary the cognitive demand of activities throughout the day	___ Schedule all high-cognitive demand activities early in the day when students are most refreshed
___Offer choices whenever possible	___Limit choices so students are forced to engage in activities that stretch their comfort
___Give concrete and specific directions so students can successfully complete what was asked	___ Use idioms and figurative language so students become accustomed to non-literal language
___Provide students with a sensory tool (hand fidget, tactile cushion, quiet fidget band for feet, etc.)	___ Provide structured breaks in the instructional period for students to re-focus
___After giving a set of instructions, students repeat back what they are to do	___ After giving a set of instructions, the teacher watches to see who needs help following them

How would you describe your skill set for teaching students with Autism, and how would you describe the way you acquired these skills?

Appendix E

Survey Instrument (continued)

Thank you very much for your participation.

- ☐ Please send a copy of the completed study to this email address: _____
- ☐ Thank you, but I do not wish to receive a copy of the completed study.

Appendix F

National Institutes of Health Human Research Certificate

Certificate of Completion

The National Institutes of Health (NIH) Office of Extramural Research certifies that **Lori Hawthorne** successfully completed the NIH Web-based training course "Protecting Human Research Participants".

Date of completion: 01/23/2015

Certification Number: 1663222

Appendix G

Northwest Nazarene University Human Research Review Committee Approval

NORTHWEST NAZARENE UNIVERSITY

Lori Hawthorne-Schlichting <lhawthorne-schlicht@nnu.edu>

RE: Protocol #19042016 - STUDENTS WITH AUTISM IN GENERAL EDUCATION ELEMENTARY CLASSROOMS: A QUANTITATIVE STUDY DISCUSSING THE IDENTIFICATION AND IMPLEMENTATION OF EFFECTIVE PRACTICE, ENVIRONMENT, AND INSTRUCTION

Northwest Nazarene University <jjhill@nnu.edu> Wed, Apr 6, 2016 at 10:56 AM
Reply-To: jjhill@nnu.edu
To: Lori Hawthorne-Schlichting <lhawthorne-schlicht@nnu.edu>

Dear Lori,

The HRRC has reviewed your protocol: Protocol #19042016 - STUDENTS WITH AUTISM IN GENERAL EDUCATION ELEMENTARY CLASSROOMS: A QUANTITATIVE STUDY DISCUSSING THE IDENTIFICATION AND IMPLEMENTATION OF EFFECTIVE PRACTICE, ENVIRONMENT, AND INSTRUCTION. You received "Full Approval". Congratulations, you may begin your research. If you have any questions, let me know.

Dr. Jennifer Hill
Northwest Nazarene University
HRRC Member
623 S University Blvd
Nampa, ID 83686

Appendix H

Content Validity for Survey Part II

	Not an Effective Practice	Moderately Effective Practice	Effective Practice	Highly Effective Practice	Number "Effective" or "Highly Effective"	I-CVI
Social Skills Instruction	0	6	5	0	5	0.45
Assign Roles During Group Work	0	4	3	4	7	0.64
Specific Rules & Consequences	0	0	2	9	11	1.00
Predictable Routines	0	0	0	11	11	1.00
Material on Classroom Walls	2	4	3	2	5	0.45
Purposeful Sensory Tools	0	2	6	3	9	0.82
Visual Schedule	0	0	1	10	11	1.00
Explain Learning Objectives	0	2	7	2	9	0.82
Required Student Response	2	4	3	2	5	0.45
Student-size Replicas	0	0	9	2	11	1.00
Students See & Hear Content	0	1	7	3	10	0.91
Break Down Large Tasks	0	0	5	6	11	1.00
					S-CVI/Ave	0.80

Appendix I

Content Validity for Survey Part IV

	Expert Responses												
	1	2	3	4	5	6	7	8	9	10	11	Number in Agreement	I-CVI
Regular or predictable reinforcement	X	X	X	X	X	X	X	X	X	X	X	11	1.00
Require a response	X	X	O	X	O	X	O	O	X	X	O	6	0.55
Assigned roles in cooperative groups	X	X	O	X	X	X	X	X	X	X	X	10	0.91
Appeal to student's unique interests	X	X	X	X	X	X	X	X	X	X	X	11	1.00
Alert students to the time remaining	X	X	X	X	X	X	X	X	X	X	X	11	1.00
Vary the cognitive demand of activities	X	X	X	X	X	X	X	X	O	X	X	10	0.91
Offer choices whenever possible	O	X	X	X	X	X	X	X	X	X	X	10	0.91
Concrete and specific instructions	X	X	X	X	X	X	X	X	X	X	X	11	1.00
Provide students with a sensory tool	O	X	X	O	O	O	O	O	X	X	O	4	0.36
Students repeat back instructions	X	X	X	O	O	X	X	X	X	X	X	9	0.82
												S-CVI/Ave	0.85

Appendix J

Fisher's Exact Test for Group Differences in Research Question 2

Groups Compared	Frequency of "Require a Response"	Frequency of "Allow a Student not to Respond"	Result of Test
Teachers of Grades 1-3	6	11	The Fisher exact test statistic value is 0.063. The result is *not* significant at $p < .05$.
Teachers of Grades 4-6	0	9	
1-12 Years of Experience	3	10	The Fisher exact test statistic value is 1. The result is *not* significant at $p < .05$.
13-40 Years of Experience	3	10	
Advanced Degree	4	9	The Fisher exact test statistic value is 0.645. The result is *not* significant at $p < .05$.
Bachelor's Degree	2	11	
ESL Endorsement	3	7	The Fisher exact test statistic value is 0.644. The result is *not* significant at $p < .05$.
Not ESL Endorsed	3	13	

Groups Compared	Frequency of "Provide a Sensory Tool"	Frequency of "Provide Structured Breaks"	Result of Test
Teachers of Grades 1-3	7	10	The Fisher exact test statistic value is 0.406. The result is *not* significant at $p < .05$.
Teachers of Grades 4-6	2	8	
1-12 Years of Experience	4	4	The Fisher exact test statistic value is 0.375 The result is *not* significant at $p < .05$.
13-40 Years of Experience	5	14	
Advanced Degree	5	9	The Fisher exact test statistic value is 1. The result is *not* significant at $p < .05$.
Bachelor's Degree	4	9	
ESL Endorsement	3	8	The Fisher exact test statistic value is 0.692. The result is *not* significant at $p < .05$.
Not ESL Endorsed	6	10	

Appendix K

Fisher's Exact Test for Group Differences in Research Question 3

Groups Compared	Frequency of Seldom/Rarely/Never Allow Sensory Tools	Frequency of Always/Often Allow Sensory Tools	Result of Test
Teachers of Grades 1-3	18	3	The Fisher exact test statistic value is 0.057. The result is *not* significant at $p < .05$.
Teachers of Grades 4-6	7	6	
1-12 Years of Experience	11	7	The Fisher exact test statistic value is 0.125. The result is *not* significant at $p < .05$.
13-40 Years of Experience	14	12	
Advanced Degree	14	3	The Fisher exact test statistic value is 0.158. The result is *not* significant at $p < .05$.
Bachelor's Degree	10	7	
ESL Endorsement	11	3	The Fisher exact test statistic value is 0.704. The result is *not* significant at $p < .05$.
Not ESL Endorsed	14	6	