

2015

# Teacher Perceptions of the Impact of Digital Photo Stories on Students with Autism Spectrum Disorder

Julia J. Conn  
*Gardner-Webb University*

Follow this and additional works at: [https://digitalcommons.gardner-webb.edu/education\\_etd](https://digitalcommons.gardner-webb.edu/education_etd)



Part of the [Special Education and Teaching Commons](#)

---

## Recommended Citation

Conn, Julia J., "Teacher Perceptions of the Impact of Digital Photo Stories on Students with Autism Spectrum Disorder" (2015).  
*Education Dissertations and Projects*. 116.  
[https://digitalcommons.gardner-webb.edu/education\\_etd/116](https://digitalcommons.gardner-webb.edu/education_etd/116)

This Dissertation is brought to you for free and open access by the School of Education at Digital Commons @ Gardner-Webb University. It has been accepted for inclusion in Education Dissertations and Projects by an authorized administrator of Digital Commons @ Gardner-Webb University. For more information, please see [Copyright and Publishing Info](#).

Teacher Perceptions of the Impact of Digital Photo Stories on Students with Autism  
Spectrum Disorder

By  
Julia J. Conn

A Dissertation Submitted to the  
Gardner-Webb University School of Education  
in Partial Fulfillment of the Requirements  
for the Degree of Doctor of Education

Gardner-Webb University  
2015

## Approval Page

This dissertation was submitted by Julia J. Conn under the direction of the persons listed below. It was submitted to the Gardner-Webb University School of Education and approved in partial fulfillment of the requirements for the degree of Doctor of Education at Gardner-Webb University.

---

Jennifer Putnam, Ed.D.  
Committee Chair

---

Date

---

Sydney Brown, Ph.D.  
Committee Member

---

Date

---

Gene Hall, Ph.D.  
Committee Member

---

Date

---

Jeffrey Rogers, Ph.D.  
Dean of the Gayle Bolt Price School of  
Graduate Studies

---

Date

## **Acknowledgements**

This dissertation was made possible by the participating dedicated teachers who enthusiastically teach students with Autism Spectrum Disorder. Thank you!

Thank you Dr. Putnam, Dr. Brown, and Dr. Hall for being a part of overseeing this research and learning about digital photo stories along the journey. I value your expertise and appreciate your support and guidance.

Thank you 2014 spring-start cohort of Gardner-Webb! Ali, Brittany, Cari, Chad, Christy, Erica, Jamie, Kari, Kristen, Lisa, Matt, Michelle, and Terree: May God be with each of you on your journey.

Thank you to my husband, Steve, for the midnight checks to make sure I was still working on the dissertation and not just surfing the internet. Thank you to my mother, Alice, for your prayers and support through the entire doctorate program and for reading the many revisions of coursework and the dissertation with a fresh eye each time. Thank you Christi and David for believing in your mother to see the doctorate program to its completion. Thank you to my incredible colleagues and friends: Pat, Christal, Marcy, Katrina, Fonda, and Mary Ann. You all provided the prayers, support, understanding, and encouragement when I was tired and overwhelmed.

Thank you to my Lord and Savior, Almighty God, who provided His blessing and guidance throughout the coursework and research. As for the future, I rest on the apostle Paul's comment, "Not that I speak in regard to need, for I have learned in whatever state I am, to be content." (Philippians 4:11, New King James Version).

## **Abstract**

Teacher Perceptions of the Impact of Digital Photo Stories on Students with Autism Spectrum Disorder. Conn, Julie J., 2015: Dissertation, Gardner-Webb University, Perceptions/Digital Photo Stories/Autism Spectrum/Multiple Intelligences/Theory of Mind/Weak Central Coherence/Weak Executive Function/Levels of Use/Technology

This study employed a qualitative method, multiple case study design to examine teacher perceptions of the impact of digital photo stories used as an instructional strategy with students with Autism Spectrum Disorder (ASD). Five highly qualified teachers of students with ASD from four public schools in a western North Carolina school district participated in open-ended interviews before and after creating and completing a digital photo story utilizing a digital photo-story tool with students with ASD.

The guiding question for this study was “How does the use of digital photo stories as an instructional tool impact teacher perceptions of students with ASD?” Qualitative methods of observation and open-ended interview questions were used to collect data to answer three research questions. (RQ1) How do various teachers approach the experience of utilizing digital photo stories with students with ASD? (RQ2) What are teacher perceptions of the impact of the digital photo-story production experience on communication skills for their students with ASD? (RQ3) What are teacher perceptions of the impact of the digital photo-story production experience on social skills for their students with ASD? The results obtained from the data collection of pre and postproject interview responses and from observations of teacher-student interactions during the lessons indicated the teachers perceived the digital photo-story process had a positive impact on the communication and social skills of their students with ASD.

Participants emphasized the connections the digital photo-story processes had with evidence-based practices such as activating prior knowledge, joint attention, technology-aided instruction and intervention (TAII), repeated readings, social stories, visual cues, use of a prompt hierarchy, feedback as reinforcement, and promoting appropriate communication skills and social behavior. Recommendations addressed further training for teachers and paraprofessionals in utilizing the digital photo-story strategy for children with ASD.

## Table of Contents

	Page
Chapter 1: Introduction .....	1
Background of the Problem .....	3
Statement of the Problem.....	5
Purpose of the Study .....	7
Research Questions .....	7
Theoretical Framework of Psychological Theories of Autism .....	8
Theoretical Framework of Multiple Intelligence .....	9
Theoretical Framework of Levels of Use .....	10
Significance of the Study .....	10
Definition of Terms.....	12
Assumptions, Limitations, and Scope (Delimitations) .....	14
Summary .....	14
Chapter 2: Review of the Literature.....	16
Introduction.....	16
Definition of ASD.....	17
Prevalence of ASD.....	18
Historical Context of ASD.....	21
Psychological Theories of ASD.....	27
Theoretical Framework of Gardner’s Theory of Multiple Intelligences .....	32
Theoretical Framework of LoU .....	35
EBPs.....	38
TAII.....	48
Digital Photo Story as an Instructional Strategy .....	50
Multiple Intelligences and EBPs.....	55
Summary .....	58
Chapter 3: Methodology .....	60
Introduction.....	60
Role of the Researcher .....	60
Research Rationale.....	61
Research Method and Design .....	62
Methodology .....	63
Issues of Trustworthiness.....	73
Pilot Study.....	77
Summary .....	78
Chapter 4: Findings.....	80
Introduction.....	80
Purpose.....	80
Procedures .....	81
Teacher Participants.....	84
Findings and Data Analysis .....	86
Researcher’s Summary Comments .....	120
Summary .....	120
Chapter 5: Discussions, Conclusions, and Recommendations .....	122
Summary .....	122

Data Collected .....	124
Data Analysis .....	126
Findings.....	127
Theoretical Framework of Psychological Theories of Autism .....	140
Theoretical Framework of Gardner's Multiple Intelligences .....	145
Implications of the Research.....	147
Recommendations for Future Research .....	149
References .....	150
Appendices	
A Institutional Review Board Approval to Conduct Research.....	164
B District Informed Consent .....	166
C Teacher Participation Consent .....	168
D Teacher Informational Protocol .....	170
E Teacher Preproject Interview Protocol .....	177
F Teacher Postproject Interview Protocol.....	181
G Student Information Protocol.....	192
H Parent Informed Consent .....	194
I Reflexive Journal .....	200
J Observation Field Notes Protocol and Coding .....	209
K Letter to Participant .....	222
Tables	
1 Gardner's List of Multiple Intelligences .....	34
2 Presenting Behaviors at Different LoU .....	37
3 NAC Established Interventions for Individuals under Age 22 with ASD .....	42
4 The National Professional Developmental Center on ASD Intervention Strategies.....	45
5 Participants' Background Information.....	85
6 Presenting Behaviors at Different Levels of Use.....	88
7 Student Information .....	89
8 Interview Responses Related to RQ1 .....	92
9 Interview Responses Related to RQ2 .....	100
10 Interview Responses Related to RQ3 .....	103
11 Multiple Intelligences and the Digital Photo Story Case #1.....	108
12 Multiple Intelligences and the Digital Photo Story Case #2.....	111
13 Multiple Intelligences and the Digital Photo Story Case #3.....	113
14 Multiple Intelligences and the Digital Photo Story Case #4.....	115
15 Multiple Intelligences and the Digital Photo Story Case #5.....	119
Figure	
Comparative Model .....	57

## Chapter 1: Introduction

Autism Speaks (2014) declared, “[a]utism is the fastest-growing serious developmental disability in the [United States]” (para. 1).

In the middle 1970s the [global] estimate of autism rate was 1 in 25,000 [children]. In the 80s it was 1 in 2,500. In the 90s it was about 1 in 250. Today, the [Centers for Disease Control] acknowledges the number is about 1 in 166 . . . and many believe it is closer to 1 in 125. 1 in 68 families in the United States now has an autistic child. (The Epidemic of Autism, 2012)

The Centers for Disease Control and Prevention (CDC), a Federal agency under the Department of Health and Human Services protection agency, funds the CDC’s Autism and Developmental Disabilities Monitoring (ADDM) Network. The ADDM Network is the only collaborative network funded to track the number and characteristics of children with Autism Spectrum Disorder (ASD) in multiple communities in the United States (U.S.) (“CDC’s ADDM Network,” n.d.). The ADDM Network (2014) data for 2010 indicated “1 in 58 children (or 17.3 per 1,000 8-year-olds) [in North Carolina] was identified with ASD” (p. 34). The ADDM Network noted this number “is higher than the average number of children identified with ASD (1 in 68) in all areas of the United States where CDC monitors ASD” (p. 34).

It is important to note the increase in numbers of the global estimates for children with ASD in the 1980s may, in part, be related to the changes made to how ASD has been defined in the U.S. since 1980, when it first appeared in the DSM-III as “Infantile Autism” and could only be diagnosed in children whose symptoms began before they were 3 years old (Haele, 2015). ASD has expanded to include diagnosis without a specific age requirement beyond the “early developmental period” and without requiring

significant language impairment in the recently revised DSM-5 (Haelle, 2015; National Public Radio, 2015a, 2015b; Silberman, 2015). Hansen, Schendel, and Parner (2015), researchers studying the changes in the definition of ASD, stated,

Changes in reporting practices [as a result of the changes in the definition] can account for most (60%) of the increase in the observed prevalence of ASDs in children born from 1980 through 1991 in Denmark. Hence, the study supports the argument that the apparent increase in ASDs in recent years is in large part attributable to changes in reporting practices. (p. 60)

Regardless of the increased prevalence rates of individuals diagnosed with ASD being inflated due to changes in diagnostic definitions, changes in reporting practices, or a real increase in ASD occurring related to genetic factors, Silberman (2015) declared,

What I say is that at least some of that money [targeted for research on prevalence statistics] should be redirected to things like helping autistic adults live more satisfying, healthier and safer lives, or helping families get the services they need or helping families get a quicker diagnosis for their kids. (para. 16)

Prior to the passage of Public Law 94-142 (Education of All Handicapped Children Act) in 1975, the Individuals with Disabilities Education Act (IDEA) Amendments of 1997 (1997), and the No Child Left Behind Act (NCLB) Public Law (P.L.) 107-110 of 2001 (U.S. Department of Education, 2010), students with disabilities were “not necessarily included to the fullest extent in instruction based on the curriculum or on grade-level content, or in assessments” (Luke & Schwartz, 2007, p. 2). Since the reauthorization of IDEA (Individuals with Disabilities Education Improvement Act 20 U.S.C., 2004) and passage of NCLB in 2001 (U.S. Department of Education, 2010), all students have to be assessed and all students (i.e., “all” means the inclusion of children

with ASD and other disabilities) have the right to quality instruction on the same curriculum (Individuals with Disabilities Education Improvement Act 20 U.S.C. §§1412(a), 2004a; 2004b).

Expectations of NCLB (2002) were that all students, including those with disabilities, would demonstrate annual yearly progress (AYP) and perform at a proficient level on state academic assessments. Simpson (2005) noted, “a salient element of NCLB relates to using effective education practices developed from scientifically based research” (p. 140). Scientifically based research (SBR) is defined “as methods that have met rigorous standards and that have been shown, when correctly applied, to reliably yield positive results [and] typically . . . have been subjected to rigorous peer-review standards” (Simpson, LaCava, & Graner, 2004, p. 69). The broad spectrum of the abilities and disabilities linked to individuals with ASD complicate and exacerbate the tedious research processes of assigning the term “evidence-based practices” (EBPs) to strategies and treatments for individuals with ASD (Simpson, 2005; Simpson et al., 2004; Stansberry-Brusnahan & Collet-Klingenberg, 2010).

Providing effective and appropriate services for children with ASD requires educators and caregivers to be knowledgeable regarding the methods of implementation, the rationale, and the impact of the strategies and treatments recommended for children with ASD (Bondy, 2001; National Autism Center [NAC], 2015; Wong et al., 2014).

### **Background of the Problem**

A proliferation of theories for defining quality instruction, appropriate services, treatments, and educational strategies relevant for children with ASD has emerged as researchers and educators grapple with the rapid increase of identified children and the complexity of their needs (Autism Research Institute, 2014; Marder & Fraser, 2012;

Odom, Collet-Klingenberg, Rogers, & Hatton, 2010). Educational literature is replete with information assigning various levels of value to the instructional strategies and treatment interventions utilized for children with ASD (Applied Behavior Analysis [ABA], 2014; Goldsmith & LeBlanc, 2004; Luckevich, 2008; NAC, 2009; NAC, 2015; Reagon, Higbee, & Endicott, 2007; Pyramid Educational Consultants, 2014; TEACCH Autism Program, 2014).

Differences in treatment approaches and methodologies pose difficulties for professionals attempting to select which strategies are most appropriate for individuals with ASD (Autism Research Institute, 2014; Marder & Fraser, 2012; National Research Council, 2001; Odom et al., 2010). Furthermore, the implementation of the strategy or intervention may vary greatly with different service providers (Marder & Fraser, 2012; Stansberry-Brusnahan & Collet-Klingenberg, 2010). Service providers' unique methods of employing the strategies "interfere with implementing the strategies and interventions with fidelity [i.e., as demonstrated in the specific treatment research literature], due in part to the rarity of finding practices that are described in enough detail to be replicable in the research literature" (Stansberry-Brusnahan & Collet-Klingenberg, 2010, p. 46).

Stansberry-Brusnahan and Collet-Klingenberg (2010) noted, "While parents [of children with ASD] are held to no particular standards when selecting treatments, professional ethics and federal laws in countries like the U.S. require educators to adopt effective practices [for students with ASD] supported by scientifically based research" (p. 46) as indicated in NCLB (U.S. Department of Education, 2010). The research for developing EBPs with this population has risen sharply, but testing and replicating findings takes time (Autism Research Institute, 2014; Marder & Fraser, 2012; Stansberry-Brusnahan & Collet-Klingenberg, 2010). Marder and Fraser (2012), considering this

dilemma, stated, “educators face the challenge of being able to accurately identify those evidence-based practices and then replicate the strategies in the classroom and other educational settings” (para. 5).

### **Statement of the Problem**

Children with ASD may exhibit absent, delayed, or atypical communication skills and poorly developed social skills; experience difficulties in play activities; and exhibit delayed cognitive skills (Autism Fact Sheet, 2015; Tager-Flusberg, Paul, & Lord, 2005). The identified cognitive delays and atypical behaviors of children with ASD often interfere with their ability to learn communication and social skills within the general education environment with their typically developing peers (Luckevich, 2008; Williams, Johnson, & Sukhodolsky, 2005). Children with ASD require explicit instruction most often in the identified areas of communication skills and social skills (Boesch, Wendt, Subramanian, & Hsu, 2013; Bondy, 2001; NAC, 2009).

It is important for educators to enlist and utilize current EBPs that facilitate increased communication and social interaction for children with ASD (Boesch et al., 2013; Bondy, 2001; Wong et al., 2014). Current SBR is supporting Technology-aided Instruction and Intervention (TAII) as a specified strategy that may be used to successfully teach communication skills and enhance social skills (Goldsmith & LeBlanc, 2004; Hetzroni & Tannous, 2004; Luckevich, 2008; More, 2008; Mozes, 2013; Odom, 2013; Reagon et al., 2007) and vocabulary and grammar (Hetzroni & Tannous, 2004; Massaro & Bosseler, 2006; Massaro, Bosseler, & Light, 2003; Moore & Calvert, 2000). However, due to ever-changing computer technology and the meteoric introduction of computer software into the educational market, additional research is needed to make technology-based strategies truly beneficial and accessible for teachers and caregivers of

children with ASD (Goldsmith & LeBlanc, 2004; Luckevich, 2008; Reagon et al., 2007).

Mozes (2013), in an informational report on the impact of technology with children with ASD, quoted Andy Shih, senior vice president of scientific affairs of Autism Speaks, who stated,

We have heard from many parents [of children with ASD] about how much their children enjoy mobile devices like the iPad, and how it is helping with learning and ommunication . . . [So] we need more research in this rapidly developing field to understand how to maximize the benefits these devices can deliver to individuals and families living with autism. (para. 7)

The digital photo story is a technology-based application that allows the user to combine personally selected pictures; illustrations and/or photos; text; audio; and, if desired, music with or without the narrative to produce a custom photo slideshow (Microsoft Photostory 3, n.d.; SonicPics, 2015). Trent (2012) listed five basic steps for producing a digital photo story. Step one is choosing a topic (or writing a script). Step two involves creating or collecting resources (e.g., pictures, drawings, photographs, maps, charts, scanned work). Developing the storyboard with the selected resources is step three. In step four, the images are imported (uploaded) into the photo-story application, audio (voice) and music are added to the images (slides), and transition, pan and zoom features may be added to each slide. In step five, the completed product may be viewed through various media including DVDs for TV or computer, iPad video, computer-based media players, and cell phone video players (Microsoft Photostory 3, n.d.; SonicPics, 2015). The digital photo story is a strategy utilizing a combination of effective learning modes and methods related to the existing EBPs determined for children with ASD (More, 2008; Sutherland et al., 2004).

There is a gap in the research and literature expressly related to the impact the digital photo story has on communication and social skills as perceived by teachers of children with ASD (Marder & Fraser, 2012; Mozes, 2013). Teachers of children with ASD would find that the results of this research contribute to their understanding the instructional value of the digital photo story and assist them in determining its prospects as an effective tool to address communication and social skills for children with ASD.

### **Purpose of the Study**

The purpose of this qualitative method, multiple case design study was to examine through observations and open-ended interviews teacher utilization of digital photo stories as an instructional tool and to consider teacher perceptions of the impact of the digital photo story on communication and social skills for children with ASD in public elementary and middle school classrooms. This study was not conducted to determine interventions for the treatment of ASD. This study was not designed to determine which manufacturer's digital photo-story tool was better or worse, simple or difficult, or teacher preferred for producing the photo-story product. The resulting qualitative data collected of teacher perceptions of the use of the digital photo story as a teaching strategy and its impact on the communication and social skills of children with ASD were analyzed, reviewed, and discussed. Implications of the findings and recommendations for future research were addressed.

### **Research Questions**

The guiding question for this study was, "How does the use of digital photo stories as an instructional tool impact teacher perceptions of students with ASD?" This study investigated three research questions (RQs) to support or nullify the guiding question:

- RQ1. How do various teachers approach the experience of utilizing digital photo stories with students with ASD?
- RQ2. What are teacher perceptions of the impact of the digital photo-story production experience on communication skills for their students with ASD?
- RQ3. What are teacher perceptions of impact of the digital photo-story production experience on social skills for their students with ASD?

### **Theoretical Framework of Psychological Theories of Autism**

Critical to conducting research with children with ASD is to discuss theories behind their ability to learn, communicate, and interact. Three psychological theories propose explanations for some of the characteristics of ASD: delayed theory of mind (ToM) (Baron-Cohen, 1995; Baron-Cohen, Leslie, & Frith, 1985; Premack & Woodruff, 1978), weak central coherence (WCC) (Frith & Happe', 1994), and impaired executive function (EF) (Baron-Cohen, 1995; Frith & Happe', 1994; Pellicano, 2012).

**Lack of ToM.** Baron-Cohen et al. (1985) presented results of a study to address the question (hypothesis): "Does the autistic child have a 'theory of mind?'" (p. 37). ToM is described as the ability of the individual to be able to infer the full range of mental states (i.e., desires, intentions, imagination, emotions, and others) that cause action. Baron-Cohen et al. addressed the highly researched theory proposing individuals who lacked the automatic ability to represent beliefs lacked ToM. The researchers concluded that there was a link between a child's ability to demonstrate ToM and social development. Baron-Cohen et al. noted children with ASD did not perform well on ToM tasks and did not have positive peer interactions.

**WCC.** Central coherence is the ability of the mind to draw together detailed

information to formulate the “big picture” (Frith, 1989). Burnette et al. (2005) described WCC as “a failure to integrate local details into a global entity” (p. 64). Social information processing “demands this type of integration” (Burnette et al., 2005) such as a young child’s ability to process faces (Pelphrey et al., 2002) and the meaning of context-dependent language (Happé & Frith, 2006). The WCC theory suggests children with ASD struggle with communication, social interaction, and behavioral flexibility due to the lack of a strong central coherence (Burnette et al., 2005; Frith, 1989).

**Weak EF.** EF involves an individual’s ability to perform skills such as organizing, planning, sustaining attention, and inhibiting inappropriate responses (Autism Speaks, 2010; Frith & Happé, 1994; Hill, 2004; National Research Council, 2001; Pellicano, 2010, 2012). Frith (2008) noted individuals with weak EF have trouble generating and manipulating ideas. Individuals with ASD exhibit a weak EF in the ability to use skills like planning, sequencing, and self-regulation (Autism Speaks, 2010; Frith, 2008).

### **Theoretical Framework of Multiple Intelligence**

Gardner’s (1983) theory of multiple intelligences provides a conceptual framework to apply to EBPs for children with ASD and to the determined learning styles, strengths, and weaknesses of the child with ASD. Gardner’s work in psychology, human cognition, and human potential led to the development of nine intelligences related to an individual’s “unique aptitude set of capabilities and ways they might prefer to demonstrate intellectual abilities” (Northern Illinois University, 2009, p. 1). Gardner’s study on the area of human potential considered participants’ preferred ways to learn and develop—aiding in understanding an individual’s learning styles, weaknesses, and strengths (Chapman, 2015; Gardner, 1993).

Children with ASD require specific strategies to overcome the learning disadvantages presented by the lack of ToM, WCC, and weak EF (Autism Speaks, 2010; Frith & Happe', 1994; Hill, 2004; National Research Council, 2001; Pellicano, 2010, 2012). It is imperative for educators to determine which strategies are most effective for allowing the child with ASD to achieve success in determined outcomes (Marder & Fraser, 2012; Mozes, 2013; Wong et al., 2014). Determining a child's learning styles, strengths, and weaknesses and providing strategies that teach to the strengths of the learning style facilitate effective learning opportunities (Chapman, 2015; Gardner, 1993; Northern Illinois University, 2009).

### **Theoretical Framework of Levels of Use**

The Concerns-Based Adoption Model (CBAM) proposed by Hall, Wallace and Dossett (1973) and further developed by Hall and Hord (1987, 2015) provided ways to study "teacher change" in the process of implementing an innovation by identifying teachers' stages of concern (SoC) and levels of use (LoU) of the innovation. Hall and Hord (2015) stated, "The three major ways in which LoU can be employed are (a) planning for the next steps in a change process, (b) facilitating the change process, and (c) conducting evaluation and research studies" (p. 119). Teachers may be at the novice stage or expert stage as users of the digital photo-story technology. Identifying and acknowledging teachers' LoU with the technology provided the framework to discuss teacher perceptions toward the experience of utilizing digital photo stories with students with ASD.

### **Significance of the Study**

Autism as a disability category was included in the 2001 reauthorization of IDEA. Marder and Fraser (2012), of John Hopkins University School of Education, provided

statistics from the U.S. Department of Education (2007), stating “the number of school age children (ages 6 to 21) receiving special education services under the category of autism . . . increased from 98,000 students in 2001 to just over 193,000 students in 2005” (para. 1), and to “440,592 students in 2012” (Institute on Disability, 2014, Table 11.3d). As the number of students with ASD served in special education has increased, the number and variety of proposed effective treatments and strategies for individuals with ASD has also rapidly increased (Stansberry-Brusnahan & Collet-Klingenberg, 2010). Marder and Fraser (2012) noted, in part, because ASD is considered to be the fastest growing identified disability, a multitude of theories for treatments and intervention strategies that have little or no evidence-based or research support are provided to professionals and caregivers delivering services to individuals with ASD. Simpson (2005) warned researchers and service providers that professionals’ and caregivers’ reliance on untested methods and dependence on strategies that lack SBR evidence have resulted in unrealistic and unreasonable expectations for students and have hindered the potential progress of students with ASD. Marder and Fraser (2012) stated, “For educators attempting to meet the diverse range of learning needs for children with ASD, decisions regarding the types of interventions to implement in the classroom and the limited research on numerous strategies can be both misleading and confusing” (para. 2). These problems indicate the urgent need to conduct current research on instructional programs and interventions for children with ASD.

Research acknowledged ASD is caused by abnormalities in the brain; however, “[t]here is no known single cause for [ASD]” (Autism Society, 2015). ADDM Network (2014) noted, “How the symptoms affect a person’s functioning depends on the severity and combination of those symptoms” (p. 5). Resulting from the broad spectrum the

disorder spans, educational strategies for children with ASD vary greatly. These variations cause much debate among teachers and caregivers when evaluating interventions and instructional strategies (Stansberry-Brusnahan & Collet-Klingenberg, 2010).

The significance of this qualitative study is that it adds to scholarly research by providing an in-depth study of teacher perceptions of children with ASD on an instructional method that may be used in the learning environment for children with ASD. This research was significant in contributing to practice in the educational profession, ASD research, and society in general. This qualitative study was also significant due to the increased prevalence of children diagnosed with ASD and the multitude of perceived effective and ineffective interventions teachers and caregivers debate as how to effectively educate children with ASD.

### **Definition of Terms**

The following definitions of terms are provided by the researcher to ensure uniformity and understanding of these terms throughout the study. The researcher developed all definitions not accompanied by a citation.

**ASD.** ADDM Network (2014) provided this definition of ASD:

Autism spectrum disorder (ASD) is a developmental disability that is caused by differences in how the brain functions. People with ASD may communicate, interact, behave, and learn in different ways. Signs of ASD begin during early childhood and usually last throughout a person's life. The term "spectrum" in ASD means that each person can be affected in different ways, and symptoms can range from mild to severe. People with ASD share some similar symptoms, such as difficulties with social interaction, difficulties with communication, and

highly focused interests and/or repetitive activities. How the symptoms affect a person's functioning depends on the severity and combination of those symptoms. (p. 5)

**Communication.** The National Autistic Society (2015) stated, "Communication happens when one person sends a message to another person either verbally or non-verbally" (para. 2).

**Digital photo story.** A collection of drawings, illustrations, photographs, or other such images put together in a digital slideshow that allows the storyteller to add music and/or record audible voice over the slides.

**Social skills.** The American Speech-Language Hearing Association (2015) listed simple activities to identify the presence of "social skills" for a normal developing child in that they "share a common focus with another person about the same object or event-known as joint attention; play with others and share toys; understand feelings; and make and keep friends" (para. 3).

**Teachers.** Professional educators hired by the district and recognized as "highly qualified"—a specific term defined by NCLB (2004). The law outlines the following minimum requirements that teachers of core academic classes must meet in order to achieve highly qualified status: hold a bachelor's degree, achieve full state certification, and demonstrate competency for each core academic content area they teach (NCLB, 2004).

**TAII or Computer-Assisted Instruction (CAI).** Odom (2013) defined TAI as Instruction or interventions in which technology is the central feature supporting the acquisition of a goal for the learner. Technology is defined as "any electronic item/equipment/application/or virtual network that is used intentionally to

increase/maintain, and/or improve daily living, work/productivity, and recreation/leisure capabilities of adolescents with autism spectrum disorders.

(p. 1)

### **Assumptions, Limitations, and Scope (Delimitations)**

**Assumptions.** An assumption of the study was that the participants were volunteers who answered interview questions truthfully and accurately based on their personal experiences and to the best of their individual abilities. Additional assumptions were participating teachers who work with children with ASD were highly qualified and knowledgeable about ASD.

**Limitations.** Limitations to the study included the number of participants; its limited generalizability beyond participants at these sites; time constraints regarding retrieval of data from observations, interviews, and general academic data; and acquiring time that was convenient for teachers to be observed and interviewed. Researcher biases and perceptual misrepresentations posed potential limitations in this study.

**Scope (delimitations).** The qualitative method, multiple case study methodology was used to collect and analyze data from observations and interviews of the participants. The scope of this qualitative study was to focus on teacher perceptions of the digital photo story's impact on communication and social skills for children with ASD. The research study was conducted at two elementary schools and two middle schools.

### **Summary**

Chapter 1 focused on the increasing prevalence of ASD in the U.S. and North Carolina (NC). Chapter 1 discussed the importance of identifying effective teaching strategies that impact communication and social skills for children with ASD. The scope of this qualitative study was to focus on teacher perceptions of the digital

photo story's impact on communication and social skills for children with ASD. The theoretical construct for this qualitative method, multiple case design study included lack of ToM (Baron-Cohen et al., 1985), WCC (Happe' & Frith, 2006), weak EF (Frith & Happe', 1994), the theory of multiple intelligences (Gardner, 1983), and CBAM's technique of addressing participants' LoU of the innovation or technology (Hall & Hord, 2015).

Chapter 2 provides a literature review of historical, philosophical, and theoretical perspectives on the development of ASD, studies related to teaching strategies for children with ASD, and various interventions and methodologies used for teaching children with ASD. The digital photo story is introduced as an instructional strategy for children with ASD. Gardner's (1983, 1993) theory of multiple intelligences is used to address the digital photo story's attributes as an instructional strategy for children with ASD. The theoretical framework regarding the construct of LoU (Hall & Hord, 1983, 2015) concerning participants' characteristic behavioral profiles while utilizing the digital photo story is described and discussed within the context of this study.

Chapter 3 discusses the methodology employed to conduct this study. Descriptions of the qualitative method research design and rationale; the role of the researcher; the research rationale; the research method and design; and trustworthiness including credibility, transferability, dependability, confirmability, and ethical considerations are provided.

## Chapter 2: Review of the Literature

### Introduction

Educational strategies and behavioral interventions must be research-driven and innovative for children with ASD to address the challenging characteristics of ASD (ABA, 2014; Autism Speaks, 2010). The review of literature begins with the definition and characteristics of children with ASD. Historical perspectives of the pioneers of the initial research of ASD identification, causation, and treatment through current scientific and medical findings on ASD are discussed. The historical perspectives and continued research of ASD led to the identification of three prominent psychological theories of ASD: lack of ToM, WCC, and impaired EF. These theories will provide the SBR structure as to how the child with ASD learns.

Gardner's (1983) theory of multiple intelligences is discussed in relation to its application for a theoretical framework for this study. Current evidence-based strategies and research-backed (i.e., SBR) intervention treatments for children with ASD are described. The strategies and interventions include ABA, Treatment and Education of Autistic and Related Communication Handicapped Children (TEACCH) strategies, and Picture Exchange Communication Systems (PECS). TAIL, previously Computer Aided Instruction (CAI), as an EBP used for children with ASD is discussed with specific regard to the digital photo story as an instructional strategy for individuals with ASD.

CBAM proposed by Hall et al. (1973) is presented as a theoretical framework for viewing how teachers change in the process of implementing an innovation by identifying teachers' SoC and LoU of the innovation. This study focused on teachers' LoU of the digital photo story as a tool to provide deeper understanding of each teacher's entry LoU for utilizing the digital photo-story technology.

## Definition of ASD

ASD is a lifelong developmental disability defined by diagnostic criteria that include deficits in social communication and social interaction and restricted, repetitive patterns of behavior, interests, or activities (Constable, Grossi, Moniz, & Ryan, 2013; Warreyn, van der Paelt, & Roeyers, 2014). Initial signs and symptoms must be present in the early developmental period of a child; however, social deficits and behavioral patterns might not be recognized as symptoms of ASD until a child is unable to meet social, educational, occupational, or other important life stage demands. Functional limitations vary among persons with ASD and might develop over time (Constable et al., 2013).

American Psychiatric Association (2013) provided the diagnostic criteria for ASD 299.00 (F84.0). Psychologists and psychiatrists utilize the following criteria (the information is not cited in full text) from the DSM-5 (Autism Speaks, 2015) when evaluating individuals for ASD:

- A. Persistent deficits in social communication and social interaction across multiple contexts, as manifested by the following, currently or by history:
  - 1. Deficits in social-emotional reciprocity.
  - 2. Deficits in nonverbal communicative behaviors used for social interactions.
  - 3. Deficits in developing, maintaining, and understanding relationships.
- B. Restricted, repetitive patterns of behavior, interests, or activities, as manifested by at least two of the following, currently or by history:
  - 1. Stereotyped or repetitive motor movements, use of objects, or speech.
  - 2. Insistence on sameness, inflexible adherence to routines, or ritualized

patterns or verbal nonverbal behavior.

3. Highly restricted, fixated interests that are abnormal in intensity or focus.

4. Hyper- or hypo-reactivity to sensory input or unusual interests in sensory aspects of the environment

C. Symptoms must be present in the early developmental period (but may not become fully manifested until social demands exceed limited capacities, or may be masked by learned strategies in later life).

D. Symptoms cause clinically significant impairment in social, occupational, or other important areas of current functioning.

E. These disturbances are not better explained by intellectual disability (intellectual developmental disorder) or global developmental delay.

Intellectual disability and ASD frequently co-occur; to make comorbid diagnoses of ASD and intellectual disability, social communication should be below that expected or general developmental level. [Autism Spectrum Disorder 299.00 (F84.0)] (Autism Speaks, 2015, para. 1).

The full text of the DSM-5 Diagnostic Criteria for ASD (Autism Speaks, 2015) included specific illustrated descriptions and examples of what deficits “look like” and identified severity levels required for an individual to qualify for ASD. Psychologists and psychiatrists are provided coding instructions to denote any additional associated medical, neurodevelopmental, behavioral, or genetic conditions to aide in the reliability and validity qualifying processes for determining if an individual has ASD (Autism Speaks, 2015).

### **Prevalence of ASD**

The global prevalence of ASD has increased by over 30% since the earliest

epidemiologic studies were conducted in the late 1960s and early 1970s (Marder & Fraser, 2012; Thompson, 2014). Prevalence of ASD estimates from European studies in the early 1970s were one in 2,500 children in the population. The early 2000s prevalence estimates for ASD from large surveys were 1-2% of all children, or approximately one in 100 (Department of Health and Human Services, CDC, 2014).

The Department of Health and Human Services, CDC (2014) report stated, For 2010, the overall prevalence of ASD among the Autism and Developmental Disabilities Monitoring (ADDM) Network sites was 14.7 per 1,000 (one in 68) children aged eight years. Overall ASD prevalence estimates varied among sites from 5.7 to 21.9 per 1,000 children aged eight years. ASD prevalence estimates also varied by sex and racial/ethnic group. Approximately one in 42 boys and one in 189 girls living in the ADDM Network communities were identified as having ASD. (p. 1)

ASD affects children of all races and has been diagnosed worldwide. The Department of Health and Human Services, CDC (2014) report also noted its findings of ASD with relation to race/ethnicity: “Non-Hispanic white children were approximately 30% more likely to be identified with ASD than non-Hispanic black children and were almost 50% more likely to be identified with ASD than Hispanic children” (p. 1).

Changes in the definition of “autism” may provide information related to the noted increase of individuals being diagnosed with ASD. DSM-III’s definition did not consider autism as a spectrum. The 1980 definition of Infantile Autism appeared in the DSM-III as,

- A. Onset before 30 months of age
- B. Pervasive lack of responsiveness to other people

- C. Gross deficits in language development
- D. If speech is present, peculiar speech patterns such as immediate and delayed echolalia, metaphorical language, pronominal reversal
- E. Bizarre responses to various aspects of the environment, e.g., resistance to change, peculiar interest in or attachments to animate or inanimate objects
- F. Absence of delusions, hallucinations, loosening of associations, and incoherence as in Schizophrenia. (Brock, 2014, para. 3)

The revised DSM-5's definition was expanded to include diagnosis without a specific age requirement beyond the "early developmental period" and without requiring significant language impairment (Haelle, 2015; National Public Radio, 2015a, 2015b; Silberman, 2015). Hansen et al. (2015), researchers studying the changes in the definition of ASD, stated,

Changes in reporting practices can account for most (60%) of the increase in the observed prevalence of ASDs in children born from 1980 through 1991 in Denmark. Hence, the study supports the argument that the apparent increase in ASDs in recent years is in large part attributable to changes in reporting practices. (p. 56)

Glen Elliott (as cited in Haelle, 2015), chief psychiatrist and medical director of Children's Health Council in Palo Alto, California, stated, regarding the population in the Denmark study, "it is true that their analyses suggest that 'most' of the increase is explained by changes in diagnostic criteria and outpatient contacts, but 'most' is still only 60 percent, leaving 40 percent of their increase unexplained" (para. 9).

Silberman (2015) noted the idea of increases in identified diagnoses of ASD reflecting changes in diagnostic definitions rather than a real change in the

developmental condition's prevalence is not new. Haele (2015) indicated published studies in the past 15 years (2000 to 2015) have found similarly that real rates of autism have not changed significantly over the past 2 decades. A 2013 study found that identified children with ASD "clustered" where resources for diagnosis and treatment were greater (Mazumdar, Winter, Liu, & Bearman, 2013). Findings seem to indicate where there is an increased access to diagnostic services, the rate of children diagnosed with ASD is higher (Mazumdar et al., 2013).

Regardless of the reasons for the increased prevalence of individuals diagnosed with ASD, the fact remains that one of 68 children are diagnosed with ASD in the U.S. The importance of "exactly how" the prevalence of ASD numbers increased, whether inflated by changes in diagnosis or a "real" epidemic, is not as critical as the importance of how society will address the educational, societal, and personal needs of the individuals diagnosed with ASD (Haele, 2015; Silberman, 2015).

### **Historical Context of ASD**

The history of ASD involves the works of several individuals, most notably Bleuler, Kanner, Bettelheim, Asperger, Rimland and Pollak. In 1908, Bleuler, a Swiss psychiatrist noted for his contributions to the understanding of mental illness, used the New Latin word *autismus* (English translation *autism*) to "describe schizophrenic patients who screened themselves off and were self-absorbed" (CERTEC-A Division of Lund University, 2005, para. 1). *Autismus*, or autism, was derived from the Greek word *autós* (meaning "self"), and Bleuler used it to describe the "autistic withdrawal of the patient to his fantasies, against which any influence from outside becomes an intolerable disturbance" (Kuhn, 2004, p. 364).

Kanner (1943), a Johns Hopkins University psychiatrist, described what is

considered the initial description of “infantile autism” in the field of clinical psychiatry. Kanner described a distinct syndrome instead of previous depictions of such children as feeble-minded, retarded, moronic, idiotic, or schizoid. Kanner received a 33-page letter from a father who described his son with vivid details such as being the happiest when he was alone, drawing into a shell and living within himself, being oblivious to everything around him, and other now well-established indicators of ASD. Additional families had come forth (to hospitals and homes for invalid children) with similar concerns about their children.

Kanner (1943) observed, studied, and provided written descriptions, histories, and family markers of 11 children (eight boys and three girls) who exhibited the indicated characteristics. The children had obsessions for spinning toys, shook their heads from side to side, and would spin around in circles. The children would have temper tantrums when their routines were disrupted and exhibited difficulties with language—a seemingly irrelevant use of words. The children referred to themselves in the third person, repeated words and phrases spoken to them, and communicated their own desires by attributing them to others. Kanner noted that the children did have individual differences and distinct features, but the common disturbing characteristics were very evident in all the children.

Kanner (1943) discussed colleagues’ assessments of individuals considered schizophrenic—described as the inward, self-absorbed aspects in adults. However, Kanner expressed that he did not consider infantile autism an early form of schizophrenia. Kanner noted that the clinical signs were different for the two disturbances. Kanner’s patients seemed to have ASD from birth, whereas schizophrenia seemed to manifest at later stages of the individual’s life.

Kanner (1943), because of the limited size and selectiveness of his study, made an incorrect assumption that children with ASD were more likely to be born to highly intellectual parents who were White and middle or upper class (Refrigerator Mothers, 2002). He noted a tendency toward autistic behaviors in some families and described ASD as an “innate” disorder (Kanner, 1943). However, Kanner also stressed what he observed to be the cold, intellectual nature of the children’s parents, particularly their mothers. Kanner is attributed “with coining the term ‘refrigerator mother’ to describe the mothering of autistic children as if from a refrigerator that didn’t defrost” (Refrigerator Mothers, 2002, para. 2). Kanner’s focus on the dysfunctional mother-child relationship propelled psychiatrists to further the psychological cause for autism, and the “refrigerator mother” theory became the prominent psychiatric belief from the early 1940s to the late 1960s (Refrigerator Mothers, 2002). However, Kanner foresaw the need for research into the genetics of ASD around the time that deoxyribonucleic acid (DNA) was first identified as the bearer of genetic information in 1944 through scientific discoveries made by Oswald T. Avery, Colin MacLeod, and Maclyn McCarty (Fischbach, 2007).

Asperger (1944), an Austrian psychiatrist and contemporary of Kanner (working independently of each other), researched a similar disorder and searched for genetic causes (Refrigerator Mothers, 2002). Kanner published his work on ASD in 1943 and Asperger’s description of his syndrome was published in 1944. Asperger described several children in the case studies presented in his seminal paper. Asperger stated, “Instead of describing further cases in detail, let us work out the typical characteristics that autistic children have in common” (p. 67). Asperger noted the first characteristic as

A crucial point which makes clear the autistic personality type is a natural entity is its *persistence over time*. From the second year of life we find already the

characteristic features which remain unmistakable and constant throughout the whole life-span. (p. 67)

Asperger (1944) included physical appearance indicators, noting that the children lost the “chubby, soft and undifferentiated baby face [and instead had] highly differentiated, finely boned features” (p. 68). The children lacked the ability to utilize effective “eye gazing” and facial gestures to indicate social responsiveness. The volume, tone, and flow of speech were abnormal—being either too soft or overmodulated, or “unnatural, often like a caricature, which provokes ridicule in the naïve listener” (Asperger, 1944, p. 70). The language was spoken not to a listener but “into empty space” (Asperger, 1944, p. 70). Asperger noted the words and phrases spoken by the children were rich in vocabulary and adult-like.

A trait exhibited by the children was the obsessiveness they culled regarding particular subjects or topics (Asperger, 1944). Even though the children could focus on a particular preferred interest, the children failed on school lessons. In most aspects, Asperger’s “described characteristics” of his group of children resembled those described by Kanner (1943)—both groups lacked social skills. The most distinctive difference was in the description of the language: Kanner described his children as being echolalic (repeating or echoing phrases or words heard from others); whereas Asperger (1944) stated regarding his group of children, “They are able to express their own original experience in a linguistically original form” (p. 71). Kanner and Asperger provided the early research-base for the study of autism.

Bettelheim served from the late 1940s to the early 1970s as director of the Sonia Shankman Orthogenic School at the University of Chicago, a residential treatment facility for children with behavioral disorders (Refrigerator Mothers, 2002). Bettelheim

was an Austrian-born American child psychologist and writer. Bettelheim promoted Kanner's (1943) prevailing view that claimed, based on Freudian psychology (Refrigerator Mothers, 2002), that ASD was due to poor parenting with much of the blame placed on "frigid" mothers accused of rejecting their children. Bettelheim was eventually discredited by Pollak (1997), a journalist and author who had a younger brother who attended Bettelheim's residential school (Refrigerator Mothers, 2002). After spending years researching Bettelheim's views, Pollak determined that Bettelheim had exaggerated and invented his life's story and credentials, and "had popularized the destructive 'refrigerator mother' theory without adequate proof" (Refrigerator Mothers, 2002, para. 6). Pollak published the biography *The Creation of Dr. B.*, which disclosed these findings and effectively discredited Bettelheim's public views on autism.

Rimland was a parent of a child with ASD and a research psychologist, writer, lecturer and advocate for children with ASD and other disabilities (Refrigerator Mothers, 2002). Rimland "was the first person to challenge the psychiatric orthodoxy about the cause of autism" (Refrigerator Mothers, 2002, para. 5). Rimland (1964) refuted the refrigerator mother theory and published *Infantile Autism: The Syndrome and Its Implications for a Neural Theory of Behavior*. Rimland presented the argument that ASD was a biological condition (Refrigerator Mothers, 2002). With lack of media access but propelled by a small group of supportive parents, Rimland founded the National Society for Autistic Children, now the Autism Society of America (ASA). Rimland also founded and was the director of the Autism Research Institute in San Diego until his passing in 2006 (Autism Research Institute, 2014). The institute is a data-collection center and information resource for parents of children with ASD worldwide (Autism Research Institute). The website maintained by the Autism Research Institute continues to publish

and promote research for the causes and treatment for children with ASD.

The search for genetic factors that enhance the risk of ASD continues to be a high priority for researchers (Fischbach, 2007). Fischbach (2007) noted, “Evidence for changes in the deoxyribonucleic acid (DNA) sequence, structural rearrangements of DNA including sub-microscopic, *de novo* copy number variants, and epigenetic modifications of DNA, have all been reported in recent years” (para. 15). Researchers are currently seeking evidence for ASD development in the womb (Briggs, 2014). Briggs reported,

US scientists [analysed] post-mortem brain tissue of 22 children with and without autism, all between two and 15 years of age. They used genetic markers to look at how the outermost part of the brain, the cortex, wired up and formed layers. Abnormalities were found in 90% of the children with ASD compared with only about 10% of children without. The changes were dotted about in brain regions involved in social and emotional communication, and language, long before birth, they say. (p. 1)

Although the underlying reasons for the rise in prevalence are difficult to study empirically, there are some studies that suggest “prevalence increase is likely attributable to extrinsic factors such as improved awareness and recognition and changes in diagnostic practice or service availability” (Department of Health and Human Services, CDC, 2014). Results of these studies have not confirmed or nullified the theories (i.e., “the growing awareness of the condition, the expanded definition, [or] other factors” [Doheny, n.d., para 3]) behind the increase of identified individuals with ASD (Autism Speaks, 2015; Doheny, n.d.). Regardless of what causes ASD, the condition is increasingly prevalent (Department of Health and Human Services, CDC, 2014) and

children with ASD require fair educational treatment (IDEA, 2004; U.S. Department of Education, 2010).

### **Psychological Theories of ASD**

Critical to conducting research with students with ASD is to discuss theories behind their ability to learn. Three psychological theories explain some of the characteristics of autism: delayed ToM (Baron-Cohen, 1995; Baron-Cohen et al., 1985; Premack & Woodruff, 1978), WCC (Frith & Happe', 1994), and impaired EF (Baron-Cohen, 1995; Frith & Happe', 1994; Pellicano, 2012).

**Lack of ToM.** Premack and Woodruff (1978) defined ToM as the ability to attribute mental states to one's self and to others. The ability to make inferences about what other people believe to be the case in a given situation allows one to predict what they will do. Baron-Cohen et al. (1985) presented the results of a study that had as its basic purpose to address the question (hypothesis), "Does the autistic child have a 'theory of mind' (ToM)?" (p. 37). Baron-Cohen et al. described ToM as the ability of the individual to be able to recognize and understand the full range of mental states (i.e., thoughts, feelings, desires, imagination, emotions, and intentions of other people) that cause action.

Baron-Cohen et al. (1985) addressed the theory that individuals with ASD lacked the automatic ability to represent beliefs, therefore they lacked a ToM. Baron-Cohen et al. utilized the Wimmer and Perner's (1983) puppet play paradigm to test postulates (i.e., false-beliefs, memory, and reality) of ToM with two groups of children. Control groups were composed of normal children and children with Down's syndrome who were compared with an experimental group of children with ASD. The children with ASD had higher mental ages than the children in the control group. The "false-belief test" or Sally-

Anne task (Baron-Cohen et al., 1985) involved two dolls, Sally and Anne. After conducting a “Naming Question” (Baron-Cohen et al., 1985, p. 41) to assure the child knew which doll was who, the researcher presented the Sally-Anne task, as a “puppet play.” Sally puts a marble in a basket and leaves the scene. While Sally is gone, Anne transfers the marble to a box. Sally returns to the scene and the experimenter asks the critical Belief Question, “Where will Sally look for her marble?” (Baron-Cohen et al., 1985, p. 41).

Children who answered the question by pointing to the basket passed the Belief Question (Baron-Cohen et al., 1985). They were able to understand Sally’s false belief that the marble was still in the basket where she had originally placed it. Children who answered the question by pointing to the box failed the question. They were unable to understand Sally’s belief that the marble was still in the basket. Baron-Cohen et al. (1985) stated, “These conclusions [were] warranted if two control questions [were] answered correctly: ‘Where is the marble really?’ (Reality Question); ‘Where was the marble in the beginning?’ (Memory Question)” (p. 42). The control questions were asked to establish that the child knew the current location of the marble and had an accurate memory of the previous location of the marble.

The control group (made up of children with Down’s syndrome and children with no disabilities) performed like normal 4-year-olds on this task. The children in the control group correctly indicated the basket was where Sally would look for the marble. The group of children with ASD, even though their mental ages were considerably higher than those of both the normal children and the children with Down’s syndrome, wrongly pointed to the box where the marble really was. This failure revealed that the children with ASD had difficulty in taking Sally’s belief into account. Therefore, Baron-Cohen et

al. (1985) concluded ToM is independent of mental retardation and is specific to autism. Baron-Cohen et al. addressed the possibility that a small subgroup of children with ASD may be able to use ToM behaviors, but they did not feel that these potential findings warranted discussion in this particular study.

Baron-Cohen et al. (1985) presented the premise of ToM—that once an individual is able to reflect on the content of one’s own mind and the minds of others, it can be stated that individual has developed a ToM. The individual must be able to understand the mental state of others, allowing the ability to make sense of past behavior, allowing an influence on present behavior, and permitting a prediction of future behavior. The ability to predict another’s future behaviors is a critical component of social skill development. The theory followed the indicators that demonstrated that children who performed well on ToM tasks had positive peer interactions. It was noted that children with ASD did not perform well on ToM tasks and did not have positive peer interactions. Baron-Cohen et al. concluded that there was a link between a child’s ability to demonstrate ToM and social development.

Children with strong ToM know that other people have thoughts that differ from their own and understand that they need to consider these differences during all social interactions. Another term for weak ToM is “mindblindness,” (Baron-Cohen, 1995, p. 2) or the inability of the individual to “put oneself in another person’s shoes”—the opposite of being a “mindreader, [which means having] the capacity to imagine or represent states of mind that others might hold” (Baron-Cohen, 1995, p. 2). Individuals with ASD often find it challenging to understand the nonverbal cues (i.e., facial expression, gestures, and body language) that indicate another person’s thoughts, feelings, intentions. and beliefs; or they may misinterpret those cues and respond very differently than one might expect.

This weak ToM also manifests when individuals with ASD do not understand how their actions or behaviors affect others or how they relate to how others perceive them (Baron-Cohen, 1995). This deficit has implications not only in social interactions but also for instruction in content areas that may ask students to interpret within text the thoughts, feelings, and intentions of characters. Understanding how and why a character behaves in a certain way is critical for accurate comprehension and written narrative related to story text (Baron-Cohen, 1995).

**WCC.** The WCC hypothesis (Happe' & Frith, 2006) is one of the major cognitive theories of autism. A characteristic of normal information processing is the ability to draw together diverse information to construct higher-level meaning in context or central coherence (Frith, 1989). A child with strong central coherence has the ability to see the big picture from a collective set of details. WCC is described as a limited ability to understand context or to "see the big picture." WCC can also refer to the detail-focused processing style characteristic of children with ASD (Happe' & Frith, 2006). A child with ASD may see the small, specific details but be unable to put the details together to see the overall picture (Happe' & Frith, 2006).

Frith (1989) suggested that this universal feature of human information processing was disturbed in autism and that a lack of central coherence could explain the characteristics exhibited by the participants with ASD in her studies. On the basis of the WCC theory, Frith correctly predicted that participants with ASD in her research studies would be relatively good at tasks requiring attention to local information (piece-meal processing) but poor at tasks requiring the recognition of global meaning. The result of this concentrated focus on details is that a child with WCC may have much difficulty inferring to understand a concept, assimilating information, discovering meaning, and

comprehending information (Constable et al., 2013; Happe' & Frith, 2006).

**Weak EF.** EF is traditionally used as an umbrella term for functions performed by the brain such as planning, working memory, impulse control, inhibition, and shifting set as well as the initiation and monitoring of action (Frith & Happe', 1994; Hill, 2004; National Research Council, 2001; Pellicano, 2010, 2012). EFs are typically impaired in individuals with acquired damage to the frontal lobes as well as in a range of neurodevelopmental disorders that are likely to involve congenital deficits in the frontal lobes (Hill, 2004). The National Research Council (2001) found that students with ASD who had EF issues struggled with “organization and planning, working memory, inhibition control, impulse control, time management, prioritizing, and using new strategies” (p. 1). Students with ASD with EF issues have difficulty initiating their work, staying on task, and being able to organize themselves (National Research Council, 2001). Frith (2008) noted that individuals with EF differences have trouble generating and manipulating ideas. Students with ASD may have difficulty integrating new information, situations, or rules with existing concepts and knowledge, especially in times of stress (Frith, 2008). These problems typically manifest as perseverative responses (i.e., getting “stuck” performing the same action) and difficulties switching flexibly between response sets (Autism Speaks, 2010).

Pellicano (2012) stated there is general consensus that EF problems are unlikely to play a primary causal role in autism. However, the degree of difficulties in EF could play a substantial role in developmental outcomes for children with ASD—including their social competence (i.e., the weak ToM decreasing the ability to evaluate social situations and respond effectively), their adaptive behavior skills necessary to live independently and to function well in real-life settings, and their success in school

(Constable et al., 2013; Pellicano, 2012).

Researchers have shifted away from a framework that emphasizes a single, primary neurocognitive atypicality (such as EF) as the underlying cause of ASD to one that encompasses multiple cognitive atypicalities including ToM, the WCC, and the impaired EF theories (Frith & Happe', 1994; Robinson, Goddard, Dritschel, Wisley, & Howlin, 2009). The potential limitations of ToM, WCC, and impaired EF affect the learning of students with ASD (Robinson et al., 2009). Clinicians, educators, parents, and all who work with children with ASD should pair EBPs to address difficulties in ToM, central coherence, or EF (Constable et al., 2013). It is, therefore, imperative to research the strategies that are most effective for allowing the child with ASD to be more successful in integrating new information, new situations, understanding rules with existing concepts, processing general knowledge, learning to use organizational skills, and increase outcomes of performances on presented tasks (Robinson et al., 2009).

### **Theoretical Framework of Gardner's Theory of Multiple Intelligences**

Gardner's (1983, 1993) theory of multiple intelligences provided a conceptual framework to apply to EBPs for children with ASD and to the learning styles of children with ASD. Gardner (1983), a psychologist and professor of neuroscience from Harvard University, stated the purpose of his early work: "I seek to replace the current, largely discredited notion of intelligence as a single inherited trait (or set of traits) which can be reliably assessed through an hour-long interview or paper and pencil test" (p. 284).

Gardner's early work in psychology and later in human cognition and human potential afforded opportunities to perform interviews with and brain research on hundreds of people including stroke victims, prodigies, people with ASD, and "idiot savants" (Gardner, 1983, 1999; Smith, 2008). With reference to the population studied in

Gardner's research, Gardner (1993) stated, "I have developed a framework that can be applied to any educational situation. If the framework is adopted, it may at least discourage those interventions that seem doomed to failure and encourage those that have a chance for success" (pp. 9-10). Noted were the three general categories in which people learn: visual learners, auditory learners, and kinesthetic learners.

Gardner's work led to the development of an initial list of six intelligences. Gardner later expanded on these six to nine intelligences with the possibility of others eventually expanding the list (Gardner, 1999). Gardner's list of nine multiple intelligences and abilities attributed to each are provided in Table 1 (Workshop: Tapping into Multiple Intelligences, 2014).

Table 1

*Gardner's List of Multiple Intelligences*

Intelligence	Ability
Verbal-Linguistic Intelligence	well-developed verbal skills and sensitivity to the sounds, meanings and rhythms of words
Mathematical-Logical Intelligence	ability to think conceptually and abstractly, and capacity to discern logical or numerical patterns
Musical Intelligence	ability to produce and appreciate rhythm, pitch and timber
Visual-Spatial Intelligence	capacity to think in images and pictures, to visualize accurately and abstractly
Bodily-Kinesthetic Intelligence	ability to control one's body movements and to handle objects skillfully
Interpersonal Intelligence	capacity to detect and respond appropriately to the moods, motivations and desires of others
Intrapersonal Intelligence	capacity to be self-aware and in tune with inner feelings, values, beliefs and thinking processes
Naturalist Intelligence	ability to recognize and categorize plants, animals and other objects in nature
Existential Intelligence	sensitivity and capacity to tackle deep questions about human existence, such as the meaning of life, why do we die, and how did we get here

The intelligences (or competencies) listed in Table 1 relate to a person's unique aptitude set of capabilities and ways they might prefer to demonstrate intellectual abilities. Gardner proclaimed in his research,

All human beings possess all nine intelligences in varying amounts. Each person has a different intellectual composition. Education may be improved by addressing the multiple intelligences of students. These intelligences are located

in different areas of the brain and can either work independently or together.

These intelligences may define the human species. (“Workshop,” 2014, para. 6)

Gardner’s (1983) theory of multiple intelligences has become associated directly or indirectly with studies focused on interventions and instructional strategies for children with ASD. The theoretical underpinnings in this literature review, particularly the theory of multiple intelligences, related to this study as it demonstrated the kinds of intelligences that are associated with how children with ASD learn. How well the child with ASD learns as a result of the effectiveness of selected interventions and instructional strategies was significant to this study.

### **Theoretical Framework of LoU**

Research findings confirm people in general are resistant to change and to implementing or using new innovations/technology (Fullan, 2001; Hall & Hord, 2015). CBAM and its framework consisting of addressing individual’s affective side of change (i.e., reactions, feelings, attitudes) or SoC and the individual’s behaviors (i.e., how the user interacts) or LoU with respect to a change or using new strategies/tools enables the researcher to “understand the cognitive and affective phases involved in understanding and implementing new practices” (Hall & Hord, 2015, p. xxxii). Addressing individuals’ perceptions and concerns about their abilities to successfully implement a change or use an innovation is itself a theoretical construct on understanding the “Levels of Use—progress from unfamiliarity of something to taking possession of it, using it, and shaping it to fit comfortably” (Hall & Hord, 2015, p. xxxii). CBAM’s research-based component of LoU has been widely practiced and used as a construct from “doctoral dissertation investigations [to] technical reports from evaluations of educational innovations” (Anderson, 1997, as cited in Hall & Hord, 2015, p. xxxii).

CBAM served as the framework for Hollingshead's (2009) study of a districtwide implementation of Rachel's Challenge, a character education program, in Rockwall, Texas. CBAM's principles of SoC and LoU were used to address the "concerns and extent of program adoption by teachers" (Hollingshead, p. 166) during the first year of implementing the program. CBAM strategies culled information to allow administrators and campus facilitators to develop supporting strategies for teachers to attain higher levels of implementation in the character education program.

Wang's (2014) study of the implementation process of a "new English language curriculum for [a] senior secondary school in China" (p. 22) used CBAM principles to examine SoC and LoU of three teachers involved in implementing the new curriculum. Findings suggested the three teachers' LoU were at two levels—mechanical use and routine use. Wang's findings were able to suggest lack of teacher training and inadequate teaching time were factors hindering "the implementation of the new curriculum in...classrooms" (p. 22). Wang noted curriculum reform in China is considerably demanding. Teachers in China face a multitude of challenges,

the most revolutionary of which will be to change their mindset from within; teachers need to be ready to change their beliefs about themselves as teachers before they can be motivated to enhance their own competence so as to implement the new curriculum in any reasonable way. (Wang & Lam, 2009, p. 76)

The ability to examine these teachers' LoU to enact changing a mind-set confirms the power and importance of understanding participants' LoU in research studies utilizing new strategies, tools, or processes.

The LoU framework recognizes eight levels of how individuals act with a change:

nonuse, orientation, preparation, mechanical use, routine, refinement, integration, and renewal (Hall & Hord, 2015). Some typical behaviors at each LoU of the innovation are presented in Table 2.

Table 2

*Presenting Behaviors at Different LoU*

VI Renewal	The user is seeking more effective alternatives to the established use of the innovation.
V Integration	The user is making deliberate efforts to coordinate with others in using the innovation.
IVB Refinement	The user is making changes to increase outcomes.
IVA Routine	The user is making few or no changes and has an established pattern of use.
III Mechanical Use	The user is making changes to better organize use of the innovation.
II Preparation	The user has definite plans to begin using the innovation.
I Orientation	The user is taking the initiative to learn more about the innovation.
0 Nonuse	The user has no interest, is taking no action.

*Note.* Adapted from Hall and Hord (2015, p. 108).

Table 2 information concerning recognizable behaviors at different LoU enables the researcher to construct a deeper understanding of each user's entry level for utilizing the practice involved in the investigation. With the introduction of a new technology procedure, LoU would initially be utilized to acquire participants' background knowledge and access level of ability in conjunction with respect to the procedure. Assuming all of the participants must become users of the practice, a survey or an interview protocol with open-ended questions may be utilized to assess the individual's knowledge of the practice

or tool—and to determine who may have previous experience with the strategy (Hall & Hord, 2015). Responses would provide information as to which LoU individuals are on—determining whether they would be considered nonusers or users at the launch of the required practice. An orientation providing the participants directions of use and addressing questions and concerns prior to the implementation of the new tool would be necessary to provide “nonusers” (Hall & Hord, 2015, p. 108) preparation for use of the technology. The orientation would provide a refresher to individuals at advanced LoUs. The role of the presenter would to “be as supportive as possible, providing assistance so that when use does begin, it can proceed as efficiently and smoothly as possible” (Hall & Hord, 2015, p. 108).

After initial professional development has provided individuals with hands-on learning experiences, guidelines, manuals, and other materials of “how to use” the tool or practice, the researcher might conduct the LoU One-Legged Interview (i.e., an informal discussion) visiting with the “user in a brief and informal way to gain an estimate of his or her LoU in order to offer appropriate assistance” (Hall & Hord, 2015, p. 114). The LoU One-Legged Interview and/or simple open-ended interview questions afford the researcher the opportunity to determine the user’s expected behaviors of interactions with the tool. Fullan (2001) noted change is a process not an event. Over time, participants may progress to higher LoUs by examining and evaluating the outcomes as a result of implementing the tool and making changes to increase outcomes, coordinating with others in using the innovation and seeking effective alternatives to the established use of the innovation (Hall & Hord, 2015).

## **EBPs**

Prior to the mid-2000s, identifying EBPs for individuals with ASD occurred

though the process of systematic narrative reviews by recognized authors (e.g., Simpson, 2005) and organizations committed to research for ASD (Wong et al., 2014). The reviews provided useful information, but a precise review process incorporating clear expectations had not been established (Wong et al., 2014). The review processes often excluded single case design (SCD) studies in favor of employing a randomized experimental group design. Wong et al. (2014) noted, “By excluding SCD studies, such reviews a) omit a vital experimental research methodology now being recognized as a valid scientific approach . . . and b) eliminate the major body of research literature on interventions for children and youth with ASD” (p. 4).

NAC (2009) completed its first comprehensive project called the *National Standards Project*. Its goal was to identify the level of research support available for interventions for children and adolescents with ASD. The report established criteria for evidence-based programs to be utilized for children with ASD. A thorough and systematic review of the treatment literature was used to determine whether the practice or strategy was effective for individuals with ASD. The report called on the scientific and educational research communities to continue to conduct SBR on practices and treatments used for individuals with ASD. Committed to this cause, in 2014, the NAC completed its second expanded comprehensive project titled the *National Standards Project Phase 2* (NAC, 2015). NAC’s (2015) goal was to

provide the strength of evidence supporting educational and behavioral interventions that target the core characteristics of these neurological disorders; describe the age, diagnosis, and skills/behaviors targeted for improvement associated with intervention options; identify the limitations of the current body of research on [ASD] interventions; and offer recommendations for engaging in

evidence-based practice for ASD. (p. 9)

An increase of EBPs from 11 identified in the 2009 report to 14 in the 2014 report was noted. Based on the literature reviews and studies, the report made these claims:

There are 14 Established Interventions that have been thoroughly researched and have sufficient evidence for us to confidently state that they are effective.

There are 18 Emerging Interventions that have some evidence of effectiveness, but not enough for us to be confident that they are truly effective.

There are 13 Unestablished Interventions for which there is no sound evidence of effectiveness. (NAC, 2015, p. 41)

NAC's (2015) National Standards Project identified 18 emerging interventions. These are interventions for which one or more studies indicated favorable outcomes but for which "additional high quality studies are needed that consistently show these interventions to be effective for individuals with ASD" (p. 71). Emerging Interventions included "Picture Exchange Communication System (PECS), Structured Teaching, Social Communication Intervention, ToM Training, and Technology-based Intervention" (p. 71).

NAC's (2015) National Standards Project identified 13 Unestablished Interventions. There is "little or no evidence in the scientific literature" (p. 72) to establish the interventions as effective—and some may even be "ineffective or harmful" (p. 72). The Unestablished Interventions include Animal-Assisted Therapy, Facilitated Communication, Gluten-free/Casein-free diet, and Shock Therapy. NAC noted there may be many other Unestablished Interventions for which little or no research has been conducted or the interventions are relatively new and studies have not been published in peer-reviewed journals.

The 14 Established Treatments (NAC, 2015) are listed in Table 3 with a brief description provided. The Established Treatments would be considered EBPs for individuals with ASD.

Table 3

*NAC\* Established Interventions for Individuals under Age 22 with ASD*

Intervention	Description
Behavioral Interventions	Behavioral interventions begin with an evaluation of what happens in the environment before <i>and</i> after a behavior being targeted. Using the collected data, the environment is modified accordingly to increase desired behaviors. (p. 42)
Cognitive Behavioral Intervention Package	Cognitive behavioral interventions utilize strategies that allow the individual with ASD to describe feelings/emotions; work with therapists, teachers or parents to develop scales to identify anxiety; or homework assignments to work on behaviors in the home, school or community. (p. 45)
Comprehensive Behavioral Treatment for Young Children	Applied early intervention strategies and utilization of targeted programs (using evidence based strategies). (p. 47)
Language Training (Production)	Language training that targets the ability of the individual with ASD to produce verbal communication thorough various strategies such as modeling verbalizations, prompting, music and reinforcement of targeted language responses. (p. 49)
Modeling	Demonstrating the expected behavior. (p. 51)
Natural Teaching Strategies	Generalization refers to the ability to perform any acquired skill across different stimuli and settings, and with different people. (p. 53)
Parent Training	Interventions used by parents who act as therapist or received training to implement strategies such as joint attention activities, support groups and training manuals. (p. 58)
Peer Training Package	Teaching peers how to get the attention of the child with ASD, facilitate sharing, provide help and affection, model appropriate play skills, be a “good buddy,” and help organize play activities. (p. 57)
Pivotal Response Treatment (PRT)	The goal of PRT is to target pivotal behavioral areas that may have an effect on the development of many other skills. PRT places a strong emphasis on self-management. (p. 59)
Schedules	Schedules assist with transition. Target daily activities and, if possible, include planning for events on a daily, weekly, or monthly basis. (p. 61)

(continued)

Intervention	Description
Scripting	Scripting consists of providing the individual with a verbal and/or written script that serve as a model—which can be practiced repeatedly before using in the actual situation. (p. 63)
Self-management	Teach the student to perform steps that the interventionist, teacher/parent would otherwise do. (p. 65)
Social Skills Package	The social skills package includes the use of reinforcement, prompting and modeling to instruct the individual with ASD to recognize facial expressions, perform in turn-taking and joint attention activities, and problem solve. (p. 67)
Story-based Intervention	Story-based interventions involve written materials that are designed to increase independence. (p. 69)

*Note.* NAC = National Autism Center's [NAC] Evidence-Based Practice and Autism in the Schools (2015).

The 14 Established Interventions in Table 3 have ample research support to demonstrate they are effective (NAC, 2015). The majority of the interventions were developed in the behavioral sciences, special education field, and developmental psychology (NAC, 2015).

The National Professional Development Center on ASD developed the following criteria to be considered an EBP for individuals with ASD:

If it was supported by: (a) two high quality experimental or quasi-experimental design studies conducted by two different research groups, or (b) five high quality single case design studies conducted by three different research groups and involving a total of 20 participants across studies, or (c) there is a combination of research designs that must include at least one high quality experimental/quasi-experimental design, three high quality single case designs, and be conducted by more than one researcher or research group. (Wong et al., 2014, pp. 15-16)

Table 4 is populated with The National Professional Development Center on ASD identified interventions as meeting the criteria for EBPs (Wong et al., 2014). A brief

description of the strategy is included.

Table 4

*The National Professional Development Center on ASD Intervention Strategies*

Intervention	Description
Antecedent-based interventions (ABI) include a group of treatments designed to modify the environment <i>before</i> a target behavior occurs.	Antecedent interventions include a group of treatments designed to modify the environment <i>before</i> a target behavior occurs.
Cognitive Behavioral Intervention (CBI)	Strategies and techniques that use computers to teach.
Differential Reinforcement of Alternative, Incompatible or Other Behavior (DRA/I/O)	Reinforcing a desired behavior that is incompatible with the problem behavior.
Discrete Trial Teaching (DTT)	A one-to-one trial or teaching strategy that has a definite beginning and end (a discrete trial) utilizing carefully planned antecedents and consequences.
Exercise (ECE)	The use of physical exertion to reduce problem behaviors or increase desired behaviors.
Extinction (EXT)	A strategy based on ABA and is used to reduce or eliminate unwanted behavior by abruptly withdrawing or terminating the positive reinforcer that maintains an inappropriate target behavior.
Functional Behavioral Assessment (FBA)	A systematic way of determining the underlying function or purpose of a behavior so that an effective intervention plan can be developed.
Functional Communication Training (FCT)	A systematic practice to replace inappropriate or ineffective behavior serving a communicative function with a more appropriate or effective behavior or skills.
Modeling (MD)	Providing a demonstration of the expected behavior.
Naturalistic Interventions	Interventions transpiring in naturally occurring settings, routines and activities; the learner plays an active role in aspects of the instructional interaction (e.g., choice of location, materials, persons involved).

(continued)

Intervention	Description
Parent Training	Providing training to the parents who are in a position to be the most effective teachers of their children with ASD.
Peer-Mediated Instruction - Intervention (PMII)	Teaching peers to initiate and maintain interactions with children with autism.
Picture Exchange Communication System (PECS)	An augmentative/alternative communication system for children with limited or no verbal skills who are taught the method of exchanging pictures to request the targeted desired object or action (Pyramid Educational Consultants, 2014).
Pivotal Response Training (PRT)	An approach that teaches the student to respond to naturally occurring learning opportunities and to seek out such opportunities by enhancing four pivotal learning variables: motivation, responsivity to multiple cues, social initiations, and self-regulation.
Positive Behavioral Intervention and Support (PBIS)	A tiered prevention and intervention approach that uses a variety of EBPs to increase positive behaviors and reduce interfering behaviors.
Prompting	A behaviorally-based strategy to provide the learner with levels of assistance to complete the desired task.
Response Interruption & Redirection	The physical prevention (e.g., blocking) of a learner's presentation of an interfering behavior and immediate redirection to another, more appropriate activity.
Reinforcement	Any activity a person does to increase the likelihood of the behavior being repeated.
Shaping	A strategy in which reinforcement of successive approximations of a desired behavior is applied until the targeted behavior is learned.
Self-Management	A method by which learners are taught to monitor and take data on their own behavior.
Social Skills Groups	Social skills are best learned in the context of social situations.
Social Stories	Individualized stories often including pictures or other visual aids to assist in providing clarity and understanding of a situation.

(continued)

Intervention	Description
Stimulus Control and/or Environmental Modification	Involves manipulating aspects of the environment that are known to impact a learner's behavior such as lighting, temperature, space and noise.
Task Analysis and Chaining	Techniques that consist of breaking the task into smaller steps until learned; then utilizing start to finish (forward) chaining or finish to start (backward) chaining, the learned tasks are "chained" together until the entire task is able to be performed instruction or interventions in which technology is the central feature supporting the acquisition of a goal for the learner.
TAII <i>Previously</i> Computer Aided Instruction (CAI) and Speech Generating Devices	Technology is defined as "any electronic item/ equipment/ application/or virtual network that is used intentionally to increase/maintain, and/or improve daily living, work/productivity, and recreation/leisure capabilities of adolescents with autism spectrum disorders" (Odom, 2013).
Time Delay	A process to prevent prompt dependency in which the teacher fades prompts by implementing a predetermined time delay (about 5 to 10 seconds) to wait before delivering a prompt.
Video Modeling	An instructional method that uses assistive technology (computers, digital cameras, etc.) as the core component of instruction: (a) the individual being taught or other models are videotaped performing some targeted behavior, (b) the video recording is then played back to the learner, and (c) the learner is prompted or asked to perform the behavior.
Visual Supports	Tools such as pictures, written words, gestures, objects within the environment, arrangement of the environment or visual boundaries, schedules, maps, labels, organization systems, timelines, and scripts that assist the child throughout his or her daily routine.

The National Professional Development Center on ASD's list of EBPs (Wong et al., 2014) provided in Table 4 are updated periodically. The EBPs condoned by the NAC (2015) and The National Professional Development Center on ASD (Wong et al., 2014) are essentially the same. This duplication of recognizing the specific EBPs adds strength to the reliability and validity of the results of the studies.

## TAII

TAII is an area that began approximately the same time the field of research for causality of and education for children with ASD (and all disabilities) got underway. In the U.S., the birth of researching functional TAI in the late 1960s and early 1970s (Colby, 1967, 1968, 1973) coincided with the mandate for public schools to educate all children with disabilities (Public Law 94-142, Education for All Handicapped Children Act of 1975, 1975). Colby (1973), in a seminal research article, described one of the earliest attempts to use a computer to stimulate language development in children with autism.

Colby (1973) and his team developed a system that consisted of a “television-like screen and a typewriter-like keyboard in front of which the child sits or stands” (p. 2). The typewriter and screen were hooked to a computer that was located in a different part of the building. The child would press a letter on the typewriter and simultaneously hear the computer say the letter. In another game, the child pressed a letter (e.g., “H”) and then saw a horse moving across the screen together with sound from the horse’s hoofs. The goal of this early TAI was to mimic normal spontaneous language acquisition and to encourage free exploration of the computer material.

Colby (1973) discussed results from 17 nonverbal children with ASD and claimed that 13 of the children showed positive gains in language acquisition. The children started to use some voluntary speech and often displayed enjoyment and motivational gains. Colby did not provide details as to how many sessions were used, how long the intervention continued, or how the children were selected for the study or diagnosed. However, the study was considered groundbreaking in TAI for children with ASD and continues to be cited and discussed in professional journals, dissertations, articles, and

professional documents (e.g., Armstrong, 2009; Fletcher-Watson, 2014; Goldsmith & LeBlanc, 2004; Heimann, Nelson, Tjus, & Gillberg, 1995; Hetzroni, & Tannous, 2004; Luckevich, 2008; Mahomed, 2005; Pennington, 2010; Ploog, Scharf, Nelson, & Brooks, 2012; Tjus, Heimann, & Nelson, 2001). Colby (1973) stated,

We began about seven years ago with a working hypothesis and two well known facts. The hypothesis was that a nonspeaking autistic child's primary difficulty lay in an inability to process symbols, language being of course the most important symbolic system used in human communication. The first well-known fact indicated that prognosis was highly correlated with speech, the outlook for nonspeakers being poor. The second fact was the common observation that these children played for hours with machines while remaining indifferent to interactions with people. (p. 1)

Colby (1967, 1968) and fellow pioneers at Stanford University utilized a type of TAI as early as 1967. In a less-cited research study, but also groundbreaking, Colby (1967) described a project of utilizing a computer to aid in the "language development of nonspeaking mentally disturbed children" (title page). Colby (1967) noted, "Each child had been studied at length and their records contained the familiar terms 'brain-damaged,' 'aphasic,' 'autistic,' 'mentally retarded,' 'schizophrenic'" (p. 1).

In this study, Colby (1967) stated that computer-aided methods were focused solely on studying language functions and not as a method of treatment for the various disorders of the children. The hope was to have the children utilize the computer as a toy to help or augment the acquisition of language. The initial computer was a "teletype connected to a Digital Equipment Corporation PDP-1 in the Zeus time-sharing system at Stanford" (Colby, 1967, p. 6). This computer was changed to a "Philco Display [an 8 by

10 inch screen with a keyboard] . . . reminiscent of a television screen” (p. 6) on which the child could point to letters or pictures, trace symbols, and “to ‘feel’ the figures appearing before him” (p. 6). Colby noted that the display occupied “about half of a 10’ by 10’ room” (p. 6). Speakers and two microphones for recording to and from the sessions were utilized. A sitter monitored the child (and protected the equipment) but was not to interfere while the child “played” with the computer. Of the group of 10 children in the study, eight “improved linguistically while 2 [two] were unimproved” (p. 34). Colby did not specifically define “improved linguistically” but did note in the study that the children were more responsive, utilized voluntary verbal sounds, and participated in propositional speech while interacting with the computer.

Colby (1967) determined that “Disturbed children do not resist learning: they resist being taught by people” (p. 31). Colby noted that the trouble with human teachers is that they emit emotions (i.e., tired, bored, angry) and can be inconsistent with instruction which in turn may negatively affect the child. Colby theorized, “Disturbed non-speaking children need a stable, consistent, patient, and tireless agent for language development. For this a computer is ideal” (p. 31).

### **Digital Photo Story as an Instructional Strategy**

Hodgson (2012) described the digital photo story as a technology-based application that

uses images, voice narration, music, and (sometimes) motion to tell a story; incorporates storyboarding, writing a script, revision and production (and elements of the Writing Process); creates a video project that can be shared in a variety of formats; [and] encourages exploration of an idea with technology.

(slide 2)

Innovative technology, such as interactive computer programs and virtual reality for interventions focused on individuals with ASD are still relatively new and the majority of the published literature is descriptive or exploratory in nature (Wainer & Ingersoll, 2011). In the early 2000s, the digital photo story was emerging as a classroom strategy for students to create digital storytelling and learn new technology (More, 2008; Salpeter, 2005). Research studies focusing on the digital photo story as an intervention for individuals with ASD are rare, partly due to the digital photo story being a fairly new tool. The digital photo story is included in the category of “Technology-based Intervention” identified by NAC’s (2015) National Standards Project as one of the 18 emerging EBP interventions.

**History of the digital photo story.** During the 1970s and 1980s, the artistic and cultural climate of the U.S. challenged the view that creating art was only for the professionals (StoryCenter, 2015). Lay artists and arts educators “worked to increase access to artistic expression . . . [and] sought to expand the scope of creative endeavor” (StoryCenter, 2015, para. 2). In the 1980s and early 1990s, creating a personal story with multimedia took long hours and thousands of dollars. The emerging technologies of the 1990s fueled the lay practitioners’ desires to create powerful artistic contributions with the new practices (StoryCenter, 2015).

In 1995, a group of Bay Area, California, “media artists and designers came together to explore how digital media tools could be used to empower personal storytelling” (StoryCenter, 2015, para. 2). The Center for Digital Storytelling partnership was formed by members of this group. During this time, StoryCenter noted, “Dana Atchley, a media producer and interdisciplinary artist, had developed NEXT EXIT, a multimedia autobiography. Among others, he attracted local theater producer Joe

Lambert as a collaborator in producing the piece” (para. 3). Atchley was attracted to the new technology and sought innovative and less expensive multimedia solutions for solo performers to use personal photos, music, and voice to tell their story (StoryCenter, 2015).

Atchley, Lambert, and Nina Mullen founded the San Francisco Digital Media Center in 1994. This group quickly discovered that even those individuals who were inexperienced with multimedia could “produce powerful personal stories with the new technology” (StoryCenter, 2015, para. 3). This group of innovative digital storytellers “refined a curriculum that became the basis for community workshops to teach digital storytelling skills” (StoryCenter, 2015, para. 3). In 1998, the group moved from San Francisco to Berkley and renamed the Digital Media Center to the Center for Digital Storytelling, and in 2015, the organization became, simply, StoryCenter (StoryCenter, 2015). The center worked with organizations worldwide and conducted workshops for thousands of individuals eager to learn the art of digital storytelling (StoryCenter, 2015). Dana Atchley (1941-2000) is considered by media artists, technology specialists, and Wikipedia (Digital Storytelling, n.d.), to be one of the few pioneering innovators of digital storytelling. Dana Atchley (as cited in Reynolds, 2012) said about digital storytelling,

Digital storytelling combines the best of two worlds: the “new world” of digitized video, photography and art, and the “old world” of telling stories. This means the “old world” of PowerPoint slides filled with bullet point statements will be replaced by a “new world” of examples via stories, accompanied by evocative images and sounds. (para. 26)

**Digital photo story and EBPs.** The digital photo story as a standalone

technology-based strategy was not included in the studies conducted to establish EBPs for individuals with ASD (NAC, 2015; Wong et al., 2014). However, the digital photo story may be analyzed through the lens of each of the components necessary to create a digital photo story. The digital photo story shares traits with the EBP of story-based interventions, scripting (i.e., providing the child with specific scripts to model expected language), and social stories (scripted personalized stories to facilitate changes in behaviors). NAC (2015) described story-based interventions as a strategy where a specific behaviors may be targeted for which “descriptions of the situations under which [the] specific behaviors are expected to occur” (p. 69) are written into a short story. Stories may be supplemented with additional components from other EBPs (e.g., prompting, reinforcement, discussion).

Through the systematic review of 36 research studies involving story-based interventions, NAC (2015) determined story-based interventions demonstrated effectiveness at “increasing communication, learning readiness, interpersonal [skills] and self-regulation” (p. 69) for individuals with ASD between the ages of 3-14 years. Scripting and social stories increased positive behaviors and communication skills in children with ASD (NAC, 2015). Creating a digital photo story requires the creation of a story and may be individualized to meet the student’s needs.

The digital photo-story process incorporates the EBPs utilized by Joint Attention interventions (i.e., two individuals sharing a common activity or focus), modeling (i.e., demonstration of expected behavior), and Language Training (e.g., increasing verbal output through modeling the expected language or using cue-pause-point techniques). The digital photo story may be presented as an interactive project-style lesson involving the teacher and student working to complete each slide (More, 2008) which produces an

interactive experience unlike the process of creating a video or movie where a student points the camera and records (Salpeter, 2005).

The use of the digital photo story involves self-monitoring and visual supports (More, 2008) similar to NAC's (2015) EBPs of self-management (i.e., the child self-evaluates and records progress) and schedules (i.e., using photos to create steps or activity schedules). Schiller and Tillett (2004) used digital photography combined with written scripts to increase the visual literacy of young children. These interventions increase independence, communication, organizational skills, and positive behaviors (NAC, 2015).

ABA (ABA, 2014), TEACCH (TEACCH Autism Program, 2014), and the PECS (Pyramid Educational Consultants, 2014) methods are identified as EBPs used for children with ASD (Jones, Feeley, & Takacs, 2007). The digital photo-story process is able to incorporate components of each of these interventions.

ABA is based on the idea of providing structured rewards to increase desired behaviors and decrease undesired behaviors (ABA, 2014). The digital photo-story process may be conducted by the teacher providing rewards as the child moves through the production process. Targeted behaviors may also be included in the story line for a digital photo story. More (2008) noted, "The script must build on the child's strengths and be simple enough to target the identified behavior while remaining centered on the child's interests" (p. 172). ABA is a complementary intervention to allow the lesson process to be a positive experience (ABA, 2014; More, 2008).

TEACCH Autism Program (2014) developed an intervention approach called "Structured TEACCHing" which provides the student with ASD structure and organization. Structured TEACCHing considers evidence-based basic principles for

instructing children with ASD. The basic principles to be addressed are the physical structure of the environment which must be clearly defined; a schedule is designed (with words or pictures) to indicate activities in advance; a work system is provided in an organized fashion to help the child gain independence on the task; a routine is established and kept; a visual structure or visual supports are provided (e.g., colored containers, or templates), and staff trained in the TEACCH method is desirable (Edelson, 2015; TEACCH Autism Program, 2014). The digital photo-story process incorporates each of the described basic principles utilized by the TEACCH intervention.

PECS is an augmentative-alternative communication system for children with limited or no verbal skills who are taught the method of exchanging pictures to request the targeted desired object or action (Pyramid Educational Consultants, 2014). The digital photo story may be constructed with a child's specifically selected PECs photos or illustrations. The child will also use the EBP intervention of "repeating" and reviewing. These interventions increase communication and independence (NAC, 2015).

### **Multiple Intelligences and EBPs**

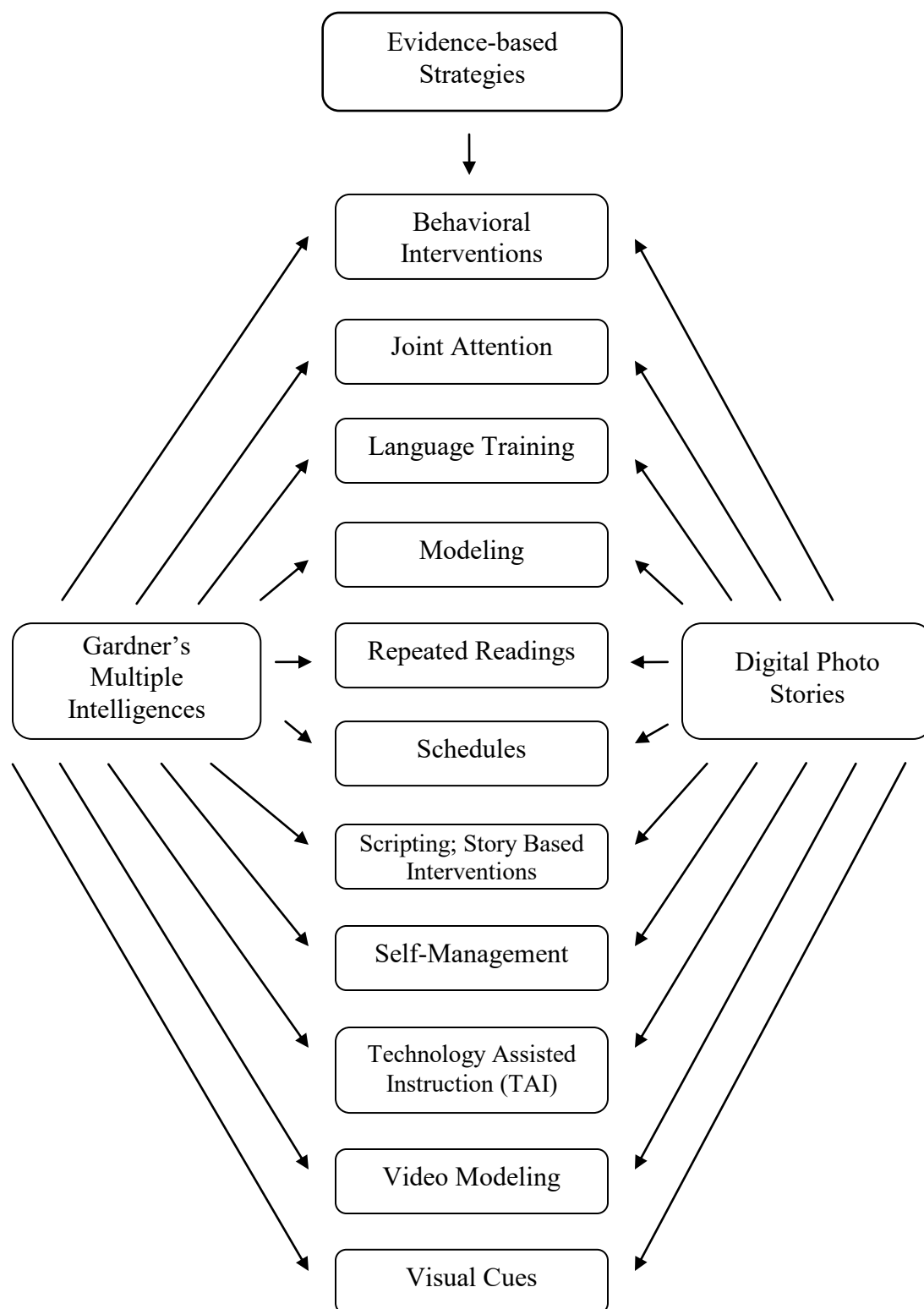
ABA, PECS, and TEACCH are EBPs that address the multiple intelligences and the psychological theories of children with ASD. With ABA, Gardner's (1999) interpersonal intelligence and ToM (Baron-Cohen et al., 1985) would be applicable. Regarding this relationship, Karim (2009) noted, "An example would be that a child with ASD would be directed to take a seat. Instead of the child sitting in the seat, the child would actually pick up the seat or chair" (p. 24). Therefore, under interpersonal intelligence and ToM, the child's deficit would be misunderstanding the intentions or motivations of another person.

Gardner's (1999) bodily/kinesthetic intelligence and the WCC theory (Happe' &

Frith, 2006) would be applicable to the TEACCH method. Karim (2009) stated of this relationship, “Teacher-led or paraprofessional-led directions would be provided in a routine, structured schedule that indicates to the child with [ASD] when and where to wear a coat, wash his or her hands, or draw a picture” (p. 24). The child would utilize movement and be provided the details necessary for processing with the WCC deficits.

With PECs, Gardner’s (1999) spatial intelligence and weak EF (Frith & Happe’, 1994) would be applicable. Karim (2009) pointed out, “This means that pictures would be used to prepare a child for the next activity or for transitioning between classes” (p. 24), helping to strengthen the organization and planning deficits of the child with ASD.

The digital photo-story process allows educators to consider a child’s range of skills and learning styles (More, 2008; Trent, 2012). Regarding the components of the digital photo story connected to learning styles, More (2008) noted, “Teachers add sound [e.g., voice and music] to each digital story. Along with gaining the student’s attention, the addition of sound allows children with visual impairments or reading difficulties to access the digital social stories independently” (p. 171). The digital photo story incorporates personally selected photos or illustrations which support the needs of visual learners. Individually constructed text “built on developmentally appropriate vocabulary, promotes literacy and provides structure to the lesson” (More, p. 171). Gardner’s (1999) intelligences addressed through these processes include verbal-linguistic, musical, visual-spatial, interpersonal, and intrapersonal. The digital photo story may be structured to incorporate a specific intelligence if designed with a specific child in mind. The empirical research-based instructional practices and the connections to Gardner’s (1983) Multiple Intelligences and the digital photo-story tool are concisely illustrated in the Comparative Model Figure.



*Figure.* Comparative Model. Gardner's (1983) Multiple Intelligences and the Digital Photo Story strategy cross-compared with EBPs utilized for children with autism spectrum disorders.

## Summary

Children with ASD (Pennington, Ault, Schuster, & Sanders, 2010; Pennington & Delano, 2012; Whalon, Otaiba, & Delano, 2009) require specialized teaching methods that are tailored to meet the child's individual needs to address the lack of ToM (Baron-Cohen et al., 1985), WCC (Happé & Frith, 2006), and weak executive function (Frith & Happé, 1994). It is imperative to utilize the strategies that are most effective for allowing the child with ASD to be more successful. Gardner (1993) stated that the theory of multiple intelligences could be applied to any educational situation. Gardner's proclamation would include children with ASD.

The multiple intelligence levels of children with ASD were considered during the process of creating and completing the digital photo story. The instructional strategies used by the teachers while conducting the processes of creating and completing the digital photo story with the student with ASD were considered and noted in the Observational Field Notes. Through implementation of appropriate instructional strategies, teachers may increase student engagement and overall comprehension of the presented information (Karim, 2009; Whalon et al., 2009). The digital photo-story process used in this study was aimed to investigate teacher perceptions of its impact on communication and social skills for students with ASD in educational settings. CBAM's principle of LoU (Hall & Hord, 2015) was applied to the teachers' initial understanding of the digital photo story at the outset of the study to provide a theoretical framework for viewing the behaviors of the teachers utilizing the tool.

Gardner's (1983) multiple intelligence theory has become associated directly or indirectly with studies focused on interventions and instructional strategies for children with ASD. The Comparative Model Figure provided an illustration of this association.

The theoretical underpinnings in this literature review, particularly the theory of multiple intelligences, related to this study as it demonstrated the kinds of intelligences that are associated with how children with ASD learn. Teacher perceptions of how well the child with ASD is able to learn as a result of the effectiveness of the interventions and instructional strategies was significant to this study.

## **Chapter 3: Methodology**

### **Introduction**

The purpose of this qualitative multiple case study was to examine teacher perceptions of the impact of the digital photo story on communication and social skills for children with ASD in public elementary and middle school special education classrooms. This study was not an intervention study, as the study involved observing and interviewing the teachers using the photo story and their perceptions of its impact on communication and social skills of children with ASD.

This chapter describes the methodology used to conduct this study. Descriptions of the role of the researcher; the research rationale; research method and design; issues of trustworthiness including credibility, transferability, dependability, confirmability; and ethical considerations are included.

### **Role of the Researcher**

In this study, the role as researcher was to design the study, recruit participants, conduct pre and postproject interviews, and be the nonparticipatory observer-recorder. Recruitment of participants was completed utilizing purposefully selected participants and sites “that [best helped] the researcher understand the problem and the research question” (Creswell, 2014, p. 189). Participants were recruited from the researcher’s school district through informed consent through district administration (Appendix A).

Professional relationships with teachers selected for the study were of equal status with the researcher. The researcher was a classroom teacher and observed classroom teachers. Students in the researcher’s class were not utilized for the study. The researcher’s biases towards the photo story as a tool was managed by arranging a media specialist not connected with the study to provide training to the participating teachers in

the use of the photo-story tool. The media specialist was knowledgeable of the photo-story process and provided an organized training session at the participating teachers' respective school sites.

Ethical issues included doing one case study within the researcher's own work environment—but in a separate classroom with a recruited teacher. Students at the selected middle schools were former students of the researcher, but the researcher was not directly involved in student-teacher utilization of the photo story and was not involved in the instruction or lesson processes presented to exert or project beliefs or biases on participants to influence perceptions.

### **Research Rationale**

Based on the review of the literature and the theoretical framework that guided this study, RQs were generated and designed to examine teacher perceptions of the effects of digital photo stories on communication and social skills for the student with ASD as it pertained to classroom monitored and assessed demonstrated growth in the areas of communication and social skills. As presented in Chapter 1, the guiding question for this study was, "How does the use of digital photo stories as an instructional tool impact teacher perceptions of students with ASD?"

- RQ1. How do various teachers approach the experience of utilizing digital photo stories with students with ASD?
- RQ2. What are teacher perceptions of the impact of the digital photo-story production experience on communication skills for their students with ASD?
- RQ3. What are teacher perceptions of impact of the digital photo-story production experience on social skills for their students with ASD?

## Research Method and Design

Baxter and Jack (2008) declared, “Rigorous qualitative case studies afford researchers opportunities to explore or describe a phenomenon in context using a variety of data sources” (p. 544). A qualitative case study allows “the researcher to explore individuals or organizations, simple through complex interventions, relationships, communities, or programs” (Baxter & Jack, 2008, p. 544). Creswell (2014) stated that the qualitative method of research was useful when “a concept or phenomenon needs to be explored and understood because little research has been done on it” (p. 20). The qualitative method allowed the researcher to explore a “topic that [was] new, [and] the subject had never been addressed with a certain sample” (Creswell, 2014, p. 20). The qualitative method is useful in exploring perceptions of participants (Creswell, 2014).

Yin (2003) stated a case study design should be considered when the focus of the study is to answer how and why questions; the researcher is not able to manipulate the behaviors of the participants in the study; the researcher explores contextual conditions because they may be relevant to the phenomenon under study; or the boundaries are not clear between the phenomenon and context. Stake (1995) described three types of case studies: intrinsic (i.e., the researcher has a high interest in a unique situation where results will have limited transferability); instrumental (i.e., the intent is to understand a situation or phenomenon); and collective (i.e., more than one or multiple cases are examined).

Yin (2003) declared a multiple case study either “(a) predicts similar results (a literal replication) or (b) predicts contrasting results but for predictable reasons (a theoretical replication)” (p. 47). Baxter and Jack (2008) stated, “a multiple case study enables the researcher to explore differences within and between cases. The goal is to replicate findings across cases” (p. 548). Yin noted in the multiple case study design

comparisons will be drawn, therefore cases must be carefully selected so the researcher can predict similar results across cases, or predict contrasting results based on a theory. The qualitative method, multiple case study design was selected for this study because the digital photo story as a strategy has little research available on teacher perceptions of its impact on communication and social skills for the child with ASD. The researcher explored differences and drew comparisons within and between multiple cases.

A pitfall of the case study design is the “tendency for researchers to attempt to answer a question that is too broad or a topic that has too many objectives for one study” (Baxter & Jack, 2008, p. 547). A researcher must determine what the case study will not incorporate by placing boundaries on the case or “binding the case” (Baxter & Jack, 2008, p. 546). Placing boundaries on the specifics of the scope of the study aids in binding the case. Baxter and Jack (2008) noted several authors provide recommendations on how to bind a case including “(a) by time and place (Creswell, 2003); (b) time and activity (Stake, 1995); and (c) by definition and context (Miles & Huberman, 1994; Zucker, 2009). Binding the case will ensure . . . [the] study remains reasonable in scope” (pp. 546-547). The case studies for this research study were bound by time, place, activity, definition, and context as described in the methodology.

## **Methodology**

The qualitative multiple case study method was employed which included pre and postproject interviews with teachers of children with ASD. Digital photo-story sessions (i.e., the process required by the teacher to create and complete a story with the student) were observed and video recorded to capture the interactions and reactions of the participating teacher and student. This qualitative study utilized an inductive questioning style with the researcher’s questions being open-ended to allow participants to provide

answers in a manner reflecting the respondents' own perceptions rather than those of the researcher (Creswell, 2014). Teachers were interviewed pre and postproject with constructed open-ended questions.

Creswell (2014) defined a qualitative observation as when “the researcher takes field notes on the behavior and activities of individuals at the field site” (p. 190). Creswell noted that the researcher would perform the observation utilizing either a loose or tight framework to permit the gathering of data in response to the open-ended questions designed by the researcher.

The researcher conducted one-on-one audio-recorded pre and postproject open-ended interviews with teachers, observed and video recorded teachers instructing students, wrote field notes (during observations), maintained a reflexive journal, and used open and axial coding for analysis of collected data. While conducting observations, the researcher's role was nonparticipant observer.

**Participant selection logic.** The participants in the study were purposefully selected by choosing teachers of students who were diagnosed with ASD who received instruction in the Intensive Intervention special education programs in local elementary and middle schools with district consent. Johnson and Christensen (2012) stated, “in purposive sampling, the researcher specifies the characteristics of a population of interest and then tries to locate individuals who have those characteristics” (p. 231).

The two elementary school programs and two middle school programs were utilized as sites in the study because the district special education programs are located at these schools and they were easily accessible in terms of proximity and willingness to participate. Creswell (2014) defined this method of selecting participants and sites as a “convenience sample . . . because the investigator must use naturally formed groups (e.g.,

a classroom, an organization, a family unit) or volunteers” (p. 168). Purposefully selected participants and sites utilizing convenience sampling provided the population of students and teachers for the study.

The number of sites and participants necessary for a research study may vary. Creswell (2014) noted that “sample size depends on the qualitative design being used” (p. 189). Creswell suggested qualitative case studies should “include four to five cases” (p. 189). This study purposefully selected five teachers from four of the Intensive Intervention programs for students with ASD in the participating district (of the six programs available, the researcher’s classroom was not involved in the study to decrease the possibility of bias concerns).

**Informed consent.** Following the Institutional Review Board (IRB) approval to conduct research (Appendix A) and the local school district approval to conduct research in the schools (Appendix B), consents from participating teachers were obtained (Appendix C). Teacher participants were allowed to consent to participate, choose not to participate, or withdraw early without any penalty. Consenting teachers received appropriate training on the photo-story process from an independent (of this study) technology trainer and then were observed utilizing the digital photo story while teaching and working with a selected student with ASD. The consenting teachers provided general-knowledge information (Appendix D) and were interviewed utilizing pre and postproject open-ended question protocols (Appendices E and F). Each teacher completed a Student Information Protocol (Appendix G ) noting the range of the student’s verbal ability, communication skills, and social skills at low, medium, or high.

Parents of the students with ASD selected by the teachers to complete a photo story received and signed district approved informed consent forms (Appendix H) that

provided them with details about the investigation including benefits and risk. District-approved parent consent was received to video record the photo-story sessions so that an independent observer could assess interobserver agreement and treatment integrity. Participating students' parents were also informed of their right to withdraw their child from the investigation at any time with no adverse consequences.

**Instrumentation and data collection.** A reflexive journal (Appendix I), observation data collection sheets, pre and postproject interview protocols (Appendix J), video recording, audio recording, and artifacts of photo stories were utilized for data collection. The source for each of the observation recording protocols and interview questions were researcher produced.

**Reflexive journal.** Morrow (2005) noted, "researcher reflexivity provides an opportunity for the researcher to understand how her or his own experiences and understandings of the world affect the research process" (p. 253). Rennie (2004) defined reflexivity as "self-awareness and agency within that self-awareness" (p. 183). It is important for the researcher to acknowledge personal assumptions and reactions with the research topic and participants (Creswell, 2014; Ortlipp, 2008; Rennie, 2004). Reflexivity, or self-reflection, was addressed by the researcher who maintained an ongoing record of personal experiences, reactions, biases, and assumptions made in a self-reflective journal. The journal entries (Appendix I) were examined and analyzed, and information obtained was incorporated into the analysis of the study (Ortlipp, 2008; Rennie, 2004).

**Audio-recorded pre and postproject interviews.** The qualitative method, multiple case study design included conducting pre and postproject interviews with teachers. A qualitative study utilizes an inductive questioning style with the researcher's

questions being open-ended to allow the participant to express personal perspectives independent of the researcher's views (Creswell, 2014). Butin (2010) discussed interviews as a "popular research method . . . a seemingly concrete and simple means for collecting key data from relevant individuals in an effective and controlled manner (p. 97). Butin noted, "the two most common modes of interviewing are one-on-one and focus groups" (p. 97). Butin discussed the importance of formulating well-prepared interview questions to allow for open-ended responses and to discourage simple yes-no answers.

During the scheduled classroom observations, the photo-story sessions were video recorded during the time the participating teacher and the selected student (with the obtained parent consent) were engaged in the photo-story activity. After each observation, the video recordings were transcribed in a Microsoft Word document and the field notes were typed in the addressed program so they were organized for the coding process and kept for verification purpose (see Appendix J).

The standardized open-ended interview approach was used in this research study. The standardized open-ended interview is structured in terms of the wording of the questions whereby participants are always asked identical questions but the questions are worded so that responses are open-ended (Turner, 2010). Open-ended questions allow participants to contribute as much information as they choose. Open-ended questions allow the researcher to ask probing questions as a means of follow-up. Handwritten notes and audio recordings were used to record the interview data.

A weakness of open-ended interviewing is the difficulty of coding the data. Coding may present as a difficult process for the researcher to thoroughly and accurately portray the perspectives of all participants (Turner, 2010). Creswell (2014) noted coding

may be developed “only on the basis of the emerging information collected . . . [or] use predetermined codes and then fit the data to them, or . . . use a combination of emerging and predetermined codes” (p. 199). If predetermined codes are utilized, Creswell suggested developing a “qualitative codebook, a table that contains a list of predetermined codes that researchers use for coding the data” (p. 199). The purpose of the codebook is to “provide definitions for codes and to maximize coherence among codes” (Creswell, 2014, p. 199). Coding reduces researcher biases within the study, particularly when the interviewing process involves many participants (Turner, 2010). For the purpose of this study, open coding was developed on the basis of the emerging information collected through the pre and postproject interview transcripts and video recordings and resulting transcripts.

A schedule of interviews was established over the course of the 3 months of the study. During the interviews, audio-taped recording was used to capture the teachers’ full responses. Pre and postproject interview questions were conducted one-on-one with each of the participating teachers. It is important to note that the participating teachers were familiar with the researcher who was not an administrator or evaluator of their status or positions. After each interview, the audio recordings were transcribed in a Microsoft Word document, organized for the coding process, and kept for verification purposes (Appendices E and F).

Initial audio-recorded interviews were conducted with the participating teachers prior to the beginning the photo-story project. Open-ended questions allowed the teachers to describe personal instructional and intervention strategies used with the child with ASD. The interview allowed the teachers the opportunity to discuss areas such as the child’s communication, social skills, and learning styles and the teachers’ ability and

comfort with the photo-story technology. Each teacher completed a Student Information Protocol (Appendix G ) noting the range of the student's verbal ability, communication skills, and social skills at low, medium, or high. The collected interview information provided the researcher with a rich understanding regarding the children's current levels of general strengths and weaknesses, documented communication abilities, and levels of social skill abilities and the teachers' preferred teaching practices and LoU with technology.

Audio-recorded postproject interviews were conducted with the participating teachers to obtain perceptions of the impact the digital photo-story project had on the communication and social skills of the child with ASD. Open-ended questions allowed the teachers to describe personal perceptions of the digital photo story as an instructional strategy, advantages and disadvantages of the tool, and other aspects of the perceived impact of the digital photo-story project on the child with ASD and information related to the participating teachers' LoU (Hall & Hord, 2015) with the tool through the process. The information was collected to address the perceptions of impact on students' communication and social skills from the utilization of the photo story as an instructional strategy.

**Video-recorded observations and field notes.** A schedule of observations was established over the course of the 3 months of the study. During the observations, video recording was used to capture the teachers' and students' responses and interactions while making a digital photo story. Audio recording and/or video recording conversations help to capture the words but do not necessarily provide the total picture of the situation (Palermo, n.d.). Therefore, handwritten field notes were used to record additional observational data. Creswell (2014) defined a qualitative observation as when

“the researcher takes field notes on the behavior and activities of individuals at the field site” (p. 190). Creswell noted that the researcher would perform the observation utilizing either a loose or tight framework to permit the gathering of data in response to the open-ended questions designed by the researcher.

Palermo (n.d.) advised the researcher taking field notes to develop “Ethnographic Eyes—an ethnographic sensibility about your site . . . or literally a new way of seeing” (Frank, as cited in Palermo, p. 7). Ethnographic Eyes would aid the researcher in noting the participants’ innuendos and the sites, flavors, and smells of the events. It is important for the observer to listen, clarify, explore without probing, and encourage those observed to provide as much information as possible.

To attain the best results from field notes, Palermo (n.d.) discussed how the researcher must organize the notes immediately after a site visit and jot down any additional pieces of information that may be forgotten easily with the passing of time (such as the mood of the respondent, places where laughter or anger occurred, expressions, and tones of the conversations).

The teacher/student processes of creating and completing the digital photo story was video recorded and observed by the researcher. The researcher took handwritten field notes during the teacher/student processes of creating and completing the digital photo story and used the video for the purpose of later viewing to explore the teacher-child relationship, the lesson presentation style, responses to the students’ behavior, the use of manipulatives, verbal feedback, visible reactions, and comments made by the teacher and child. After each observation, the video recordings were transcribed; and field notes were typed into a Microsoft Word document, organized for the coding process, and kept for verification purpose.

The digital photo-story process consisted of determining a topic, locating the desired photos and/ illustrations, creating the storyboard which incorporated writing the script and selecting the desired images and sound/music, producing the digital story using the determined software, and sharing the digital story with peers and/or publishing it on the web (Ohler, 2013; Porter, 2004). Porter (2004) stated, “Digital Storytelling takes the ancient art of oral storytelling and engages the palette of technical tools to weave personal tales using images, graphics, music, and sound mixed together with the author’s own story voice” (p. 1). Creating the digital photo story may be a simple or complex process depending on the skill level of the user, the topic selected, the desired length, and the purpose of the story. The researcher was sensitive to the variability of time necessary to create a photo story, particularly for students with ASD relative to their individual levels of functioning, and took field notes or recorded each teacher’s session with the student through the creation to publication of the digital photo story.

**Data analysis plan.** An informational protocol (Appendix D) was provided to the teacher to acquire knowledge of the participating teacher’s professional background and assist in determining the participant’s LoU with the digital photo-story technology and current teaching strategies. An audio-recorded preproject interview with the teachers utilizing open-ended questions (Appendix E) was conducted to obtain a rich description of the child with ASD and information regarding the teacher’s current LoU with the digital photo-story tool and current preferences of instructional strategies for meeting the student’s communication and social skills instructional needs.

The observation data collected during the making and viewing of the digital photo story provided comparative data points for the teachers’ answers collected from the open-ended interviews. The audio-recorded postproject interview was conducted with the

teacher utilizing open-ended questions (Appendix F) to provide perceptual data from teachers regarding the impact of the digital photo story on communication and social skills for the student with ASD. The researcher maintained a reflexive journal (Appendix I) throughout these activities to acknowledge concerns with researcher bias.

The teacher was video recorded while conducting the photo-story process with the student with ASD. The researcher took observational field notes (Appendix J) during the teacher/student processes of creating and completing the digital photo story.

Collected data from audio-recorded interviews, video-recorded observations, and field notes were transcribed, coded, analyzed, and written into the report. Written transcripts were presented and reviewed by the participants for accuracy of reporting. Findings were validated by using triangulation and member checking (Appendix K).

Peer debriefers act as a mirror, reflecting the researcher's responses to the processes and situations occurring in the research. A peer debriefer may also serve as a devil's advocate, offering alternative interpretations to those of the researcher (Frels & Onwuegbuzie, 2012). A peer debriefer reviewed and analyzed the interview questions, the transcripts, the processes, and themes attributed to the qualitative study.

The researcher analyzed data by using the processes of open and axial coding (Appendix I). Strauss and Corbin (2008) referred to the process of analyzing data as coding. Coding involves three levels of analyses: open coding, axial coding, and selective coding to gather a complete picture of the information obtained during the data collection process (Strauss & Corbin, 2008). During the open-coding process, the researcher compares data and continually asks questions about what is and is not understood to assist in the identification of different categories, properties, and dimensions within and among the data (Strauss & Corbin, 2008). The axial coding

procedure pieces data together in new ways allowing connections between categories by asking questions and making comparisons, relating subcategories to a category (Strauss & Corbin, 2008). Strauss and Corbin defined selective coding as identifying and choosing the core category, systematically connecting it to other categories, validating those similarities and relationships, and then completing categories needing further refinement and development. The concepts and relationships developed through the coding process help guide the data collection and analysis of data to construct the findings of the research.

Open coding consisted of the process of reading the transcripts of the interviews and field notes several times to locate emerging themes of information (Creswell, 2014; Gallicano, 2013). Labels were assigned to the emergent themes and recorded in a table to allow the researcher to establish properties for each code. Axial coding was the process of identifying the connections of the open codes (Creswell, 2014; Gallicano, 2013) which provided the discussion in the findings of the data in Chapter 4.

### **Issues of Trustworthiness**

**Credibility.** Trustworthiness of the research was achieved through various methods including triangulation, member checking, and peer debriefing (Creswell, 2014). The researcher's role was to collect data utilizing a qualitative approach. Findings were validated by using triangulation and member checking. Triangulation is a validity procedure where researchers search for convergence among multiple and different sources of data to form themes or categories in a study (Creswell, 2014). The researcher cross-referenced data from the observations and interviews with the themes and patterns to establish validity and accuracy. Morrow (2005) noted, "credibility [of the research study] can be achieved by prolonged engagement with participants; persistent observation

in the field; the use of peer debriefers or peer researchers; negative case analysis; researcher reflexivity; and participant checks, validation, or coanalysis” (p. 252).

While performing the observation, the researcher video recorded the teacher conducting the photo-story process with the student with proper consent (Appendix H). Interviews were audio recorded when conducted, and the researcher transcribed the interviews. The researcher conducted member checking by communicating with the teachers to verify the accuracy of the transcripts and field notes (Appendix K). Lincoln and Guba (1985) described member checking as “the most crucial technique for establishing credibility in a study” (p. 314). Creswell (2014) noted member checking involves taking back “the polished or semi-polished product, such as the major findings . . . and conducting a follow-up interview with participants” (p. 202) so they can confirm the credibility of the information and narrative account. The presentation of data must be clearly exhibited without being evaluative or judgmental (Creswell, 2014).

A peer debriefer reviewed and analyzed the interview questions, the transcripts, and the processes of the qualitative study. A peer debriefer enhances the trustworthiness and credibility of a qualitative research study (Creswell, 2014; Lincoln & Cuba, 1985).

**Transferability.** Transferability refers to the reader’s ability to note specific findings of the research and to compare them to an environment with which they are familiar. Morrow (2005) stated, “Transferability is achieved when the researcher provides sufficient information about the self (the researcher as instrument) and the research context, processes, participants, and researcher–participant relationships to enable the reader to decide how the findings may transfer” (p. 252). Qualitative studies utilizing small sample sizes are not considered generalizable in the conventional sense. It is important for the researcher to note findings may not be generalized to other

populations or settings. To establish transferability, the researcher provided a “rich, thick description to convey the findings” (Creswell, 2014, p. 202) and variation in participant selection (elementary and middle schools) to increase the prospects of the results to be more realistic and richer. Creswell (2014) reported that providing a thick description and varied perspectives “can add to the validity of the findings” (p. 202). Pre and postproject open-ended interview questions allowed the reader to become familiar with the participants and children with ASD.

**Dependability.** Triangulation is a reliability procedure where researchers search for convergence among multiple and different sources of data to form themes or categories in a study (Creswell, 2014). The researcher conducted member checking by communicating with the teachers to verify the accuracy of the data (Appendix K). The researcher cross referenced data from the observations and interviews with the themes and patterns to establish dependability (the qualitative counterpart to reliability) of the research findings.

**Confirmability.** The researcher brings a certain bias or the potential to distort findings to a study. Personal experiences influence the questions to be researched; personal relationships influence interactions with participants; and personal biases influence coding results and completing summations of the study. To establish confirmability (the qualitative counterpart to objectivity), the researcher utilized a reflexive journal (Appendix I) throughout the process of the research study. A reflexive journal allowed the researcher to self-reflect by providing “an open and honest narrative that will resonate well with readers” (Creswell, 2014, p. 202). Introspective reflexivity adds to the credibility and usefulness of qualitative research (Creswell, 2014; Roller, 2012). Ortlipp (2008) stated, “Rather than attempting to control researcher values

through method or by bracketing assumptions, the aim is to consciously acknowledge those values” (p. 695).

Utilizing a self-reflective journal can facilitate reflexivity, whereby researchers may examine “personal feelings and preconceptions” (Ahern, 1999, p. 408) and clarify “individual belief systems and subjectivities” (Russell & Kelly, 2002, p. 2). Ahern (1999) recommended 10 strategic tips to bracketing personal perceptions beginning at the outset of determining the area of research: “Before you even start refining your research question, consider starting a reflexive journal in which you can write down the issues that will enhance your reflexivity and your ability to bracket” (p. 408).

**Ethical procedures.** The IRB provided approval to conduct the study (Appendix A). The IRB monitors the ethical procedures for the treatment of human participants and notes the researcher should address participant consent or right to withdraw consent, confidentiality, and researcher biases. Ethical concerns related to data collection/intervention activities may include participants’ refusing participation or early withdrawal from the study and response to any predictable adverse events and a plan to address them. District consent to conduct the study and participant agreements to be interviewed was provided and signed (Appendices B and C). The researcher acknowledged in the participant consent form (Appendices C and H) participants’ rights to refuse or withdraw with no adverse effects. Parents of the students with ASD selected by the teachers to complete a photo story received and signed district approved informed consent forms (Appendix H) that provided them with details about the investigation including benefits and risk.

The researcher should describe treatment of collected data and archival data. All data related to the study were confidential, and participants could choose to be identified

by pseudonyms. Student descriptions, student levels of performances, and any student/caregiver data remained anonymous. Protection for confidential data (i.e., data storage procedures, data dissemination, who will have access to the data, and when the data will be destroyed) were addressed through school district policies and procedures. Data will remain archived for the required 5 years. Authorized personnel (district, university, administration) will have access to necessary data. The researcher conducted one participant study within the researcher's work environment. The researcher provided discussion and description of the process in the reflexive journal to describe the participant/researcher involvement to ensure the study was conducted in an ethical manner. Participants were provided the opportunity to debrief and discuss the process as prescribed by IRB guidelines.

### **Pilot Study**

Talab (2008) noted, "Instruments developed by the researcher should always be pilot tested" (p. 16). The researcher conducted a pilot study to determine the effectiveness of the interview questions for the teacher participants. Procedures, participation, and data collection for the instructional staff involved in the pilot study were close replications to the proposed procedures for the main research study.

Three instructional teacher assistants (TAs) who work in the Intensive Intervention classrooms consented to video record the process of making a digital photo story with a student with ASD and answer nine interview questions regarding the experience. Each TA created a digital photo story utilizing photos of the student paired with text consisting of the student's known sight words. The TA and student viewed the completed photo story with the student's peers and researcher.

Upon completion of the digital photo-story project and viewing the story with the

student, the researcher asked each TA nine open-ended RQs. The researcher-TA interview sessions were audio recorded by the researcher. Reviewing and coding the answers allowed the researcher to conclude the nine questions were of worthy quality to provide relevant information for the study. However, the researcher determined additional information could be culled to provide a rich description of the student that may provide relevant data for the study. To address this concern, a simple preproject open-ended question interview protocol was developed. A new question was added at the beginning (new number one) of the postlesson interview to allow the teachers to consider their use of instructional strategies to acknowledge and document the teachers' feelings about other strategies. The new question provided an additional guard against bias towards the digital photo story allowing teachers to share strategies they personally enjoy and utilize prior to discussing the digital photo-story strategy.

Talab (2008) stated, "Results of pilot testing and accompanying comments should be used, if necessary, to revise the instrument before distributing it to the actual sample" (p. 16). The researcher's goal was not to determine the TA's perceptions of the impact of the instructional strategy but to pilot test the questions to determine if information obtained during the main study would provide appropriate feedback to allow the researcher to complete the proposed study. The two changes made by the researcher as a result of the pilot study allowed for increased transferability and credibility.

## **Summary**

The purpose of this chapter was to describe the methodology used to conduct this study. Descriptions of the research design and rationale; the role of the researcher; the methodology; the participant selection logic; instrumentation; the procedures for recruitment; data analysis plans; issues of trustworthiness including credibility,

transferability, dependability, confirmability; and ethical considerations were included.

Chapter 4 will present the data and research findings obtained during the collecting process addressing individual RQs. Chapter 5 will present conclusions, discussion of the research findings, and suggestions for future research.

## **Chapter 4: Findings**

### **Introduction**

This qualitative multiple case study examined teacher perceptions of the impact of the digital photo-story strategy used with children with ASD. The study was conducted in two elementary schools (self-contained/instructional classes for students with ASD kindergarten through fifth grades) and two middle schools (self-contained/instructional classes for students with ASD sixth through eighth grades) in western NC. The study involved five special education teacher participants. The participants were purposively selected because they teach children with ASD.

This chapter presents a summary of the data obtained during one-on-one audio-recorded teacher interviews, video-recorded teacher/student sessions (observations) with each of the five study participants, and the researcher's reflexive journal notes. Each case subsection reports information regarding collected data and teacher perceptions addressing the RQs. Case subsections also present samples of direct quotes in table format from the teacher pre and postproject interviews and observations.

### **Purpose**

The guiding question for this study was, "How does the use of digital photo stories as an instructional tool impact teacher perceptions of students with ASD?" The following RQs were examined to assist in gaining a more in-depth understanding of teacher perceptions of the digital photo story's impact on students with ASD.

- RQ1. How do various teachers approach the experience of utilizing digital photo stories with students with ASD?
- RQ2. What are teacher perceptions of the impact of the digital photo-story production experience on communication skills for their students with

ASD?

RQ3. What are teacher perceptions of impact of the digital photo-story production experience on social skills for their students with ASD?

### **Procedures**

Four criteria for selecting teachers to participate in the study were considered. The teachers selected were highly qualified, had experience teaching students with ASD, were interested and willing to participate in this research, and taught in the district where the researcher was employed. Initial contact was made through phone calls with five highly qualified teachers who taught students with ASD in the elementary and middle school special education programs in the western NC school district where the researcher is employed as a special education teacher.

All five teachers met at individually scheduled meetings allowing the researcher to explain the purpose of the study and answer questions regarding the study. All five teachers verbally indicated they were willing to participate and completed the Teacher Participation Consent (Appendix C). The teachers completed the teacher informational protocol form (Appendix D) and student information form (Appendix G).

The five teachers were provided an organized training on using the digital photo story by a district computer instructor at each participant's respective site. The training was held at the participant's site to ensure the computers and microphones were available and operating. Each teacher had the opportunity to practice making a sample photo story with the trainer. Participants had the opportunity to discuss the process and have questions answered about the digital photo-story process and what to do in the event technical issues. All five teachers were provided access to the trainer in the event more information was wanted or necessary once the lessons began.

Each teacher selected a student classified with ASD currently on their student caseload. The researcher and the teacher made contact with the parent of the selected student to obtain district-approved informed consent allowing the child to participate in the research. Parental consent was obtained for all five students with ASD to be video recorded and observed by the researcher during the digital photo-story sessions.

The researcher then arranged the pre and postproject interviews and observation schedules with the respective teachers. All five teachers were courteous and willing to assist the researcher. Only two observations had to be rescheduled due to one teacher participant's family emergency. The data were collected from July 2015 to September 2015. The researcher was familiar with the schools. Three of the students had been taught by the researcher in previous years. The teachers and students appeared comfortable with the researcher as a nonparticipatory observer in the classroom during the photo-story sessions. The video-recorded observations had minimal impact on the classroom instructions and routines. The teacher and student completed the work on the photo story as if the researcher was not in the classroom.

This study employed a qualitative method, multiple case study design to collect data to examine teacher perceptions of the impact of the digital photo-story production experience on communication and social skills for their students with ASD. The data collected were obtained from one-on-one audio-recorded pre and postproject open-ended questions during interviews in order to gather information from the five teacher participants. The interviews were conducted, transcribed, and analyzed using questions from the researcher-generated interview protocols (Appendices E and F). The preproject interviews lasted approximately 10 to 15 minutes. The postproject interviews lasted approximately 30 to 45 minutes. Interview data were transcribed immediately after the

interviews to enable the researcher to analyze the teachers' responses and emerging questions and allow for an additional follow up for member checking and triangulation.

The interview audio recordings were transcribed and analyzed using Strauss and Corbin's (2008) open and axial coding process to determine themes related to the theoretical framework of Gardner's (1983) multiple intelligence theory and its connection to the digital photo-story process (Appendix J). The theory of multiple intelligences was examined from the participants' postproject interview comments to demonstrate connections to the intelligences that are associated with how children with ASD learn and the digital photo-story process. How well the child with ASD learns as a result of the effectiveness of the digital photo story was significant to this study.

The researcher took field notes during video-recorded observations of the teacher and student creating and completing a digital photo story (Appendix J). During observations, the researcher explored and examined the teachers' abilities to utilize the digital photo-story tool, observed teacher/student interactions, documented use of EBPs, and noted connections of the instructional strategies observed to Gardner's (1993) multiple intelligences. The observations were conducted over a period of 1 to 2 days with sessions lasting 30 to 45 minutes for each case study. Video-recorded observation data were transcribed. Codes were written in the transcribed notes to identify the categories, patterns, emerging themes, and important comments related to the categories as stated by the participants. Written transcripts were presented and reviewed by the participants for accuracy of reporting.

A reflexive journal (Appendix I) was kept to document the researchers' timeline, duties, and tasks performed during the study and thoughts involved regarding the study. The reflexive journal was utilized to acknowledge concerns with researcher bias.

### **Teacher Participants**

The highly qualified teachers selected for the study were five females. For purposes of confidentiality, each respective teacher is identified as Case #1, Case #2, Case #3, Case #4, and Case #5. Each participating teacher completed an informational protocol to denote educational degree, teaching experience, and prestudy (i.e., before the research with the photo story had started) use of selected instructional strategies including the use of the digital photo-story strategy (Appendix D). The data in Table 5 provide the participants' background information regarding the current grade-level assignment, teaching experience, and educational degree for each participating teacher. All five participants teach in a special education Intensive Intervention classroom setting structured for students with ASD.

Table 5

*Participants' Background Information*

Participant	Current Level	Experience		Educational Degree
		Years in Teaching	Years in Teaching ASD	
Case #1	Kindergarten-Second Grade	14 years	11 years	AA*; BS** in Early Childhood
Case #2	Third-Fifth Grade	5 years	5 years	BA*** Special Education Adapted Curriculum
Case #3	Second-Fifth Grade	7 years	7 years	BA Special Education Adapted Curriculum
Case #4	Sixth-Eighth Grade	4 years	4 years	BA Special Education Adapted Curriculum
Case #5	Sixth-Eighth Grade	4 years	4 years	BA Teaching Theatre K-12

*Note.* \*AA = Associate of Arts Degree; \*\*BS=Bachelor of Science; \*\*\*BA= Bachelor of Arts.

Noted in Table 5, three of the participants instruct students at an elementary school and two participants instruct at the middle school level. All five participants have a minimum of 4 years of experience teaching students with ASD. All five participants have a bachelor's degree obtained from a noted university or college and, by the fact they are employed by the district, have met the requirement of being designated as highly qualified teachers. Two of the participants had degrees outside of the Special Education Adapted Curriculum certification. In NC, teachers who have obtained a bachelor's degree are able to take assessments in core academic skills and subject-specific content knowledge to certify to teach in a specified area. The Praxis Series® (Educational Testing Service, 2015) tests measure teacher candidates' knowledge and skills. The tests are used for licensing and certification processes. Teachers who take and pass the Praxis® are considered highly qualified and may teach in the specified area.

## Findings and Data Analysis

The findings were developed from the data collected from the pre and postproject interviews and observations which are in alignment with the broad or guiding question and the RQs. The three RQs focused on teacher perceptions of the impact of digital photo stories on students with ASD specifically related to communication and social skills. The findings are organized into three parts. Part 1 consists of general information from the participants in regards to the Participant Information Protocol (Appendix D) and Hall and Hord's (2015) theory of the impact of the participants' LoU with the strategy before and after implementation of the digital photo-story tool. Part 2 consists of a narrative analysis of the researcher's review of the pre and postproject interview responses, video recordings and observation field notes of the participants' photo-story sessions with their respective student with regard to each of the three RQs. Part 3 consists of an analysis of participant responses to the postproject interview protocols related to the theoretical underpinnings of Gardner's (1983) Theory of Multiple Intelligences. Open coding of the interview responses and observation data relate participants' perceptions of multiple intelligences accessed by the student while utilizing the strategy.

**Part 1: Informational protocol from the participants.** The Informational Protocol (Appendix D) was used to obtain information about the participants' years of experience as a teacher (Table 5), their frequency of use of various instructional strategies, and their noted LoU with the digital photo-story strategy. Table 6 is populated with the participants' prestudy (i.e., before the research with the photo story had started) use of specified instructional strategies. All of the listed instructional strategies except for the digital photo story (i.e., the strategy has not been explored or reviewed in research

to date) have been identified as EBPs for students with ASD. The digital photo story was listed to provide a baseline for the participants' LoU (Hall & Hord, 2015) with the strategy.

Table 6

*Participants' Use of Instructional Strategies*

	Frequent (hourly)	Often (daily)	Sometimes (once or twice a week)	Rarely (once or twice a month)	Never
Instructional Strategies	Case #s	Case #s	Case #s	Case #s	Case #s
Activating Prior Knowledge	1,3,4,5	2			
Joint Attention	1,3,4,5	2			
Naturalistic Interventions	1,3	2,4,5			
Peer Tutoring			3,4,5	1,2	
Repeated Reading	1	2,3,4	5		
Social Stories		1,2,4	3		5
Technology Assisted Instruction	1,2,5	3,4			
Video Modeling		4	1,2	3,5	
Visual Cues	1,2,3,4,5				
Digital Photo Stories			2		1,3,4,5
Other (briefly describe) Case #2: Direct Instruction; Guided Reading					

Table 6 data indicated four teachers had never used the digital photo story as an instructional strategy. Only Case #2 indicated that the digital photo story was a strategy she used sometimes with her students with ASD. All five teachers indicated “frequent” or “often” use with the EBPs of activating prior knowledge, joint attention, naturalistic interventions, technology assisted instruction, and visual cues. These EBPs are embedded strategies utilized in the digital photo-story process (More, 2008; Trent, 2012).

Each participating teacher selected a student with ASD in their classroom with whom to create the digital photo story. Parents of the selected students signed district-approved informed consent forms (Appendix H ) that provided details about the study including benefits and risk. Parent permission was obtained to video record the photo-story sessions so an independent observer could assess interobserver agreement and treatment integrity. The preproject interview allowed the teacher to provide information related to the student's age, grade, and levels of ability specifically related to communication skills and social skills. Each teacher completed a Student Information Protocol (Appendix G ) noting the range of the student's verbal ability, communication skills, and social skills at low, medium, or high. The data for Table 7 were obtained from the answers the teachers provided regarding the selected student participant.

Table 7

*Student Information*

Case #	Student Information*	Teacher's Perceptions of Student's Functioning Levels			
		Overall Functioning Level/ASD	Verbal Skills	Communication Skills Ability	Social Skills Ability
Case #1:	6 years old, male, first grade	High	High	Medium	Medium Low
Case #2:	11 years old, male, fifth grade	Medium High	High	Medium	Low
Case #3;	6 years old, male, first grade	Medium	Medium	Medium	Medium Low
Case #4:	12 years old, male, seventh grade	Low	Low	Low	Low
Case #5:	12 years old, female, seventh grade	Low	Low	Low	Low

*Note.* \*All five students have a medical diagnosis of ASD. All five students are served in a self-contained special education classroom designed to meet the needs of students with ASD.

Table 7 data provided individual student information regarding age, gender, and grade level. Teacher ratings of the perceived student functioning and skill levels are provided as information to have a deeper understanding of the student's abilities. Specific information related to the impact of the photo story on the student's communication and social skills are discussed in findings for RQ1 and RQ2.

**Part 2: Analysis of postproject interview questions, journal entries, video recordings and observation field notes.** The narrative analysis examined the researcher's review of the open-coding categories of the postproject interview questions (Appendix F), reflexive journal entries (Appendix I), and video-recorded observations and field notes of each participant utilizing the digital photo-story tool with their respective student (Appendix J). The RQs were constructed to assist in gaining a more in-depth understanding of teacher perceptions of the impact of the digital photo-story strategy on students with ASD. Each RQ is presented and discussed in terms of the relevant findings related to each participant's observed session and responses obtained during the pre and postproject interviews. The data for Tables 8 through 10 were obtained from the interviews conducted by the researcher. Data were obtained from utilizing the open-coding process. The participants' responses were selected based on their content and relativity to the category.

**RQ1. How do various teachers approach the experience of utilizing digital photo stories with students with ASD?** This RQ was addressed through the pre and postproject interviews and observed in the video-recorded sessions. Table 8 presents teacher responses to the preproject question 4 regarding participants' initial LoU with the tool and postproject interview questions 2, "How would you describe the digital photo-story strategy and process;" and 5, "Tell me about something you experienced while

utilizing the digital photo story with your student with ASD. What changes in your ability to utilize the technology during the process did you notice?” The video-recorded digital photo-story sessions provided additional material addressing the answer to RQ1.

Table 8

*Interview Responses Related to RQ1*

<b>RQ1:</b> How do various teachers approach the experience of utilizing digital photo stories with students with ASD?		
Category	Participants' Responses	
	Preproject Interview	Postproject Interview
1. LoU	Case #1: I've looked at them and kind of tinkered with it, but no, I've never created something to completion. [I'm] very much so a novice.	Case #1: Well. I obviously had to be trained because it was a brand new thing for me. I've seen it but I've never participated. The person who trained me was good and then I practiced before I did it with the student. Well, I experienced, oh my gosh, I am not very good at this but, it was fun to work through it with [the student].
	Case #2: Well since I first began here at this school . . . this will be my fourth year using the digital photo story. I would guess [I'm closer to an expert] and some of my kids know how to do it by themselves, too.	Case #2: Well, we've used photo story and we've also tried a variety of other formats, or apps, too, and I found that photo story is all encompassing.
	Case #3: I haven't actually used the digital photo-story tool. I have some background knowledge of it just because I've seen it used in the classroom setting with other students with autism but I haven't myself made a digital photo story with a student. I am a novice.	Case #3: Well, I personally was also highly motivated to do this because I'm a beginner to photo story so even though I was nervous at first, when I saw like, how engaged and excited the student was and wanting to do it and how he responded to feedback when I would say, "okay we have to slow that down" or "we have to change our voice volume"—when it was given as a prompt, that made it more of a highly motivating thing for me.

(continued)

Category	Participants' Responses	
	Preproject Interview	Postproject Interview
2. Concerns	Case #4: I have never used the digital photo-story tool. I feel like if I got, you know, the core, the right instruction that, that's something that I could use-it could be beneficial in my classroom as well.	Case #4: Like I said earlier, I think that once I got more comfortable . . . [the student] got more comfortable, because it got more in a set routine, which he seemed to actually understand the actual expectation of each thing.
	Case #5: I have never used the digital photo-story tool. It seems rather pretty straight forward program and um, pretty simple and I think that it's going to be a cool tool to use!	Case #5: I found the creating of the photo story to be relatively easy. So I didn't have any difficulty creating it.
	Case #1: I guess just understanding the program and being able to transfer that to my student and make sure that it's an easy activity for them to participate in and that I'm not struggling the whole time [laughter] trying to figure it out I guess.	Case #1: [The student] . . . was obviously not critical of me because he didn't know what to be critical of. And I was thrilled that he embraced it because he could have very easily have shut down because he has in the past and won't attempt something but he was game the whole way through and I was thrilled.
	Case #2: <i>No concerns indicated.</i>	Case #2: on a computer, [the student] is having to keyboard and we're having to use the microphone . . . there's multiple steps. He's having to use more thinking to be able to complete the story. In the beginning he was pretty resistant to it because it seemed like a lot of work . . . once he realized the reward and the product, that he had his own movie . . . he really enjoys doing them now.

(continued)

Coding Categories	Participants' Responses	
	Preproject Interview	Postproject Interview
	<p>Case #3: I'm not really concerned about the technology piece of it, I just want to make . . . sure that I'm implementing . . . it in a smooth way so that it stays motivating for the student and it's not just me tinkering around with trying to figure it out. I want to be familiar and comfortable with it prior to implementing it with the student so that it's motivating and rewarding for the student.</p> <p>Case #4: The only concerns that I have about the process is not being familiar with it and how to navigate through the program.</p> <p>Case #5: As of right now I don't feel like I have any concerns. It seems rather pretty straight forward program and um, pretty simple and I think that it's going to be a cool tool to use!</p>	<p>Case #3: I definitely think the disadvantage for me was just that I was a novice so I, not being experienced . . . I think it was a positive tool . . . The advantages of it [the too] are mastering it, and there's so much potential there . . . to work on literacy skills and language skills and social skills and even technology skills.</p> <p>Case #4: Disadvantages that, technology is very touchy . . . if the student . . . wants to touch the computer or . . . doesn't want to speak right into the [mic] . . . it can be a little challenging to get the finished product you want. I found . . . there's so many different things you can do with it . . . not every photo story's gonna be the same and that . . . you can build from there.</p> <p>Case #5: I found that the way that I did it in a whole group setting was a little bit time consuming, a little tedious - I did have several . . . slides . . . so it was a little bit time consuming to kind of have the students wait . . . and have to be quiet while each recorded. But everyone was excited for their turn . . . it wasn't a situation where they were becoming frustrated.</p>

Table 8 provided participants' responses related to RQ1: How do various teachers approach the experience of utilizing digital photo stories with students with ASD? Two emergent themes discovered by the open coding of pre and postproject interview questions were the participants' perceived LoU with the digital photo-story tool before

and after using the tool for the project and participants' concerns about the process.

**LoU.** In the preproject interview, Case #s 1, 3, 4, and 5 indicated their LoU with the digital photo story to be that of a novice; and at Hall and Hord's (2015) LoU of "Level I Orientation: The user is taking the initiative to learn more about the innovation" (p. 108). Case #2 indicated her LoU with the digital photo-story tool to be at Hall and Hord's LoU of "IVB Refinement: The user is making changes to increase outcomes" (p. 108). In the postproject interview, Case #s 1, 3, 4, and 5 indicated their perceived LoU had increased from Level 1 Orientation to "Level II Preparation: The user has definite plans to begin using the innovation" and "Level III Mechanical Use: The user is making changes to better organize use of the innovation" (Hall & Hord, 2015, p. 108). Case #2's postproject LoU was at "VI Renewal: The user is seeking more effective alternatives to the established use of the innovation" (Hall & Hord, 2015, p. 108).

Case #3, who moved from Level 1 LoU to Level II LoU stated with regards to her postproject perceptions of the photo-story tool, "I think I could maximize the potential of it; and especially use it specifically for students' needs and really kind of cater it to my individual students in my groups' needs" (Postinterview Question #8). Case #2 noted in the postproject interview, "You know, from using it, I find that it's something that I would like to use more and more" (Postinterview Question #10). After using the photo-story tool for the research project, all five participants increased their perceived LoU one to two stages on Hall and Hord's (2015) determined stages. All five participants discussed their willingness and desire to continue to use the digital photo story as a strategy. Case #4 indicated in the postproject interview:

I think that I got comfortable enough with it to actually want to do more with it.

So, . . . I was like . . . oh, okay, like I can pick out some photos and put some

words with it . . . then now I want to see what all I can do with it . . . as far as . . .

It's made me more curious about what I can do. (Postinterview Question #10)

**Participant concerns.** Case #s 1, 3, and 4 expressed preproject concerns regarding how their lack of ability in using the tool might interfere with presenting the lesson to the student in a smooth and problem-free manner. Case #s 2 and 5 noted in the preproject interviews that they did not have any concerns.

In the postproject interview, Case #1 noted her initial concerns with her lack of ability had been dismissed because of the positive interaction she had with her student while making the photo story. Describing the process of selecting photos for the project with the students, Case #1 noted,

I made a notebook with you know, all the pictures [appropriate whole body listening techniques] and we reviewed it over and over and I will use the cue, "are you using your whole body listening"? whenever he is off task. So I thought this would be really great if I got his picture doing all the things he's been learning.

He was game for that. He thought that was awesome. (Postinterview Question #2)

Preproject concerns discussed by Case #s 1, 3, and 4 were described in the postproject interviews as absent or minimal when completing the actual photo-story project with the student. Case #s 3 and 4 indicated their concerns with their ability or fumbling with the technology during the lesson had been alleviated when the lesson went smoothly. Case #4 noted initial concerns were with managing the equipment. The student kept putting his hands on the microphone while he recorded. Case #4 acknowledged that with practice, the student was able to record without touching the microphone. Case #1 stated, "You know maybe I could have done this [create a photo

story] a lot sooner and he [the student] could be a lot further [referring to social skills].”

**Advantages and disadvantages.** Question #8, posed during the postproject interviews, asked the participants, “What advantages and disadvantages did you experience from utilizing the digital photo story as a teaching tool with your child with ASD?” Advantages noted by the teachers in the postproject interview responses included the child’s increased ability for staying on task (i.e., as compared to several other types of lesson formats such as paper and pencil activities); multiple intelligences were engaged in the process; the appeal of the personalized photos was strong and positive; the child’s excitement of recording audio and listening to the playback was evident by facial expressions and body language; and the quick turn-around time of having a completed product (i.e., the movie) to show the student and peers provided a rewarding experience for the viewers and producers.

Advantages for using the digital photo story as an instructional strategy included its direct relation to EBPs for students with autism. EBPs utilized as evidenced in the observations of the teacher and student lessons included activating prior knowledge, language training, modeling, repeated readings, scripting, self-management, technology assisted instruction, video modeling, and visual cues. Teachers noted the strategy sustained the student’s attention longer than other type of lessons using the same EBPs. During the photo-story production observations, Case #s 2, 3, and 4 noted the student would repeat readings on the digital photo story numerous times to ensure the recorded audio was correct; in contrast to behaviors when reading lessons from a book or worksheet, the student would not reread requested passages.

Disadvantages discussed by the participants included the problem of having access to a good microphone which was necessary to record the audio. For the purpose

of this research study, each participating teacher was provided a headphone with a microphone attached. Three of the teachers indicated they had their own microphones; two teachers did not have access to a microphone. The two teachers indicated that for making photo stories in the future, they would access the microphones available in the schools' media center.

Case #5 noted a disadvantage was making the photo story with too many slides and risking losing the students' attention to the story. Case #5 stated that in the future, she would make shorter stories with her students to ensure attention to task.

A disadvantage noted by Case #1

was finding time that was uninterrupted and quiet during the school day. I think that's a disadvantage with this population and this type of classroom . . . and this student looks forward to his recess time and then I didn't want to take that away.

Just finding other people to cover while we actually worked on this, I guess would be a disadvantage for it. (Postinterview Question #8)

Case #1 noted something she would change if she were to make another photo story was,

I think for me personally, I would practice a little bit more because I wasn't real sure about how to go back in . . . I had forgotten about changing the page, you know, the fade in, the fade out, or you know, turn the page. I couldn't remember how to do that and I didn't want to take up time with the student while I was trying to figure it out. So I would definitely practice that so I feel a little bit more fluent in my ability to run them through the process. (Postinterview Question #7)

Advantages were generally related to the perceptions of the digital photo story as an effective instructional strategy for students with ASD. Disadvantages of the tool were focused on the participant's novice LoU of the tool and fears of technological or

mechanical failures while making a story. Overall, the participants' noted advantages of the tool outnumbered the disadvantages of the tool. All participants noted they would make more digital photo stories in the future.

**RQ2. What are teacher perceptions of the impact of the digital photo-story production experience on communication skills for their students with ASD?** This RQ was addressed through the pre and postproject interview responses and from information observed in the video-recorded sessions.

Table 9 is populated with the teacher responses related to preproject interview item #2: Tell me about your student's communication; and information from the Student Information Protocol regarding perceived levels of verbal and communicative abilities. Table 9 also presents teacher responses to postproject item #3: What are your perceptions of the digital photo story's effects on communication for your student with ASD? The video-recorded digital photo-story sessions provided a level of confirmability and validity to the participant's answers to the interview questions.

Table 9

*Interview Responses Related to RQ2*

**RQ2:** What are teacher perceptions of the impact of the digital photo-story production experience on communication skills for their students with ASD?

Verbal Changes	Participants' Responses	
	Preproject Interview Level of Communication	Postproject Interview: Perceived Impact of the Tool
	Case #1: Yes, he's very very verbal and will use his language in all circumstances. In fact he tends to probably have a photographic memory and will recite things that he's heard and watched repeatedly to the point that it's distracting and off task.	Case #1: Yes, as a matter of fact I did [notice an impact on communication skills]. After he did the whole thing we went back and corrected like when he was talking into the microphone he wanted to put the microphone up on his mouth. He wouldn't read what he had written fluently--and then he would say, "Ohhh, I need help." ---which was good because he doesn't often ask for help. Yeah, so it really prompted him to step up, I'm gonna say.
	Case #2: He's extremely verbally savvy. He knows what to say and when to say it. He can tell you all the right things but it's just kind of acting upon it.	Case #2: Yes. I know for [the student] it has drastically increased his confidence in lots of ways . . . And he needs some help still with, you know, coming up with grammatically correct sentences..but, so that's our focus, when he's actually doing the writing. It's him sounding out the words and the grammar piece of it.
	Case #3: The student's able to communicate verbally, he expresses his wants and needs verbally, but he doesn't have the most functional, um or applicable use of his language. When he's got to explain more abstract concepts, he's not really able to do that effectively, and while he might be able to say higher level words, he doesn't fully understand their meaning.	Case #3:...it accessed the strengths . . . we were able to find a topic that he was interested in so it was highly motivating for him. The student also is good at reading-and so he felt confident in reading. But then it also addressed areas of weakness for him because when he was able to listen back to the story . . . I gave him feedback about voice volume and clarity-then he was able to address those things..he could kind of hear what parts of communication maybe weren't so good and responded to my feedback and he corrected those things when I prompted him to do so.

(continued)

Verbal Changes	Participants' Responses	
	Preproject Interview Level of Communication	Postproject Interview: Perceived Impact of the Tool
	Case #4: He can do about one to two word requests. He might every so often say, "May I please have . . ." He uses a lot of gesturing and he is able to express his wants and needs in different ways.	Case #4: I think that it helped him communicate in getting that visual of what was actually in the pictures so it wasn't just he was repeating a word, that you know, I said. I think that with everything in the pictures. He was in the picture with that item--and so I think that helped him communicate what was going on in the picture and actually knowing what he was saying.
	Case #5: Her communication is limited. She has all of her words but she tends to not want to use them She prefers to be verbal when she is one on one and is much more shy when she's in a group setting. But she can read up to second grade, first grade level books; and her inflection has gotten better, and her, you know, paraphrasing and things like that. She uses a device. She loves using her device to communicate with. And she uses full sentences when she types with that.	Case #5: The particular student I was working with- she wanted, she was very shy when she was recording it-herself. She had every one turn around so they weren't watching her when she spoke because she is like a selective mute type so she doesn't really want to talk in front of people when they're watching, but she had no problem recording it and when she listened back to make sure it sounded good, she you know, had a smile on her face and lighted up.

Table 9 provided participants' responses related to RQ2: What are teacher perceptions of the impact of the digital photo-story production experience on communication skills for their students with ASD? The pre and postproject interview information noted all five teachers indicated the photo-story session impacted the communication of students with ASD. Case #1 provided a specific example of the student independently requesting help during the process. She noted this student rarely asked for help even when he needed it.

All five teachers indicated the digital photo story had a positive impact in their

students' verbal and communication skills. Increased verbal activity noted included students using unsolicited verbal requests during the process, students interacting with the teacher at a noted increased level compared to paper and pencil lessons, students emitting sounds of excitement and expression previously not used during reading lessons, and students utilizing repeated readings without prompting from the teacher (also deemed as unusual because during reading lessons, students may refuse to engage in repeated readings). No negative impacts on communication were discussed or noted by any of the teachers.

**RQ3. What are teacher perceptions of impact of the digital photo-story production experience on social skills for their students with ASD?** This RQ was addressed through the pre and postproject interview responses and from information observed in the video-recorded sessions. Table 10 presents teacher responses to preproject interview item #3: Tell me about your student's social skills; and information from the Student Information Protocol regarding perceived levels of social skills abilities; and to postproject interview question #4: What are your perceptions of the digital photo story's effects on social skills for your student with ASD?

Table 10

*Interview Responses Related to RQ3*

**RQ3:** What are teacher perceptions of impact of the digital photo-story production experience on social skills for their students with ASD?

Social Skills	Participants' Responses	
	Preproject Interview	Postproject Interview
	<p>Case #1: Well, he tends to be by himself a lot even if he plays alongside other kids, he will perseverate on specific toys during a choice time instead of engaging with his same age peers. We do have fifth grade Paw Pals or Buddies that come in, and he does much better with an older social person. Their skill ability, they can kind of direct him and then he can do give and take that is required.</p> <p>Case #2: He's very "I" sighted, he thinks about himself always first- he doesn't have much empathy. And he's gotten better about relating to others but, he lacks empathy mostly. He lacks a sense of responsibility, especially if he makes a choice that's not okay. He doesn't understand why that might be bad. But then on the other hand, if somebody else was to go and do exactly the same thing, he's all up in their business about it. (laughs)</p>	<p>Case #1: Well he has often past issues with following directions so we had a few where he would jump ahead and wouldn't listen so we had to go back after he did the whole thing we went back and corrected. [Case #1 noted the student typically will not go back to correct mistakes. Doing the activity, he spent 10 minutes analyzing his voice and correcting the audio.]</p> <p>Case #2: It's always really exciting when somebody finishes a story because they know they're going to get to share it with their friends. And, I've seen across the board that even-regardless of how long the story is or what it's about, the child's confidence that wrote the story they just are beaming the whole time. You know, they see themselves up on the screen. So, it's really powerful especially if it is even a social story, you know, the modeling that's there and they're seeing that they're doing everything the right way. It just completely reinforces all those skills. So, and the other kids are more likely to watch it too, because it's about one of their friends, so, they're super happy about that.</p>

(continued)

Social Skills	Participants' Responses	
	Preproject Interview	Postproject Interview
	Case #3: The student has some social difficulty as kids with autism do. He is interested in being around peers, but he doesn't really know how to appropriately join in with play or social activities on his own without some kind of support or guidance.	Case #3: I personally was also highly motivated to do this because I'm a beginner to photo story so even though I was nervous at first, when I saw like, how engaged and excited he was and wanting to do it and how he was responded to feedback.
	Case #4: He likes to be around other kids but he doesn't as much interact with them. He is way more comfortable around people he is familiar with.	Case #4: In the process of doing it ..with the social skills . . . we definitely got into our own groove of things once he figured out, you know, how to go from one slide to another. He was more with the process. He understood that each time we were going to have to record and that we were going to have to listen to it to make sure, you know that it went on there okay. He was a little more animated [than when involved in routine lessons without the computer].
	Case #5: Her social skills are probably around, I would say a five to six year old socially, she is very affectionate, very hands on kind of child. She does get distracted easily. She makes great eye contact; and let's see.. She does not interact much with the other students as far as like just playing but she is very good about communicating like her space needs of if something was taken that was hers--that kind of thing.	Case #5: I saw, I think, let's see, the particular student I was working with- she wanted, she was very shy when she was recording it-herself. She had every one turn around so they weren't watching her when she spoke because she is like a selective mute type so she doesn't really want to talk in front of people when they're watching, but she had no problem recording it and when she listened back to make sure it sounded good, she you know, had a smile on her face and lighted up. I definitely saw that--I guess, one thing I did see new was their excitement of hearing their own voice--that was, that was cute.

Table 10 provided participants' responses related to RQ3: What are teacher perceptions of impact of the digital photo-story production experience on social skills for their students with ASD? The pre and postproject interview responses indicated all five

teachers perceived the digital photo-story process positively impacted the social skills of students with ASD. Case #4, who rated her student on the Student Information Protocol as low functioning with ASD, noted an increased level of participation from the student with the digital photo-story lesson compared to participation in other lesson formats (i.e., paper and pencil tasks; question and answer lessons); following the directions the first time was unusual and positive; and the student smiled and remained engaged throughout the process—a behavior that was atypical for this student. Case #4 noted,

In the process of doing it . . . with the social skills . . . we definitely got into our own groove of things once he figured out, you know, how to go from one slide to another. He was more with the process. He understood that each time we were going to have to record and that we were going to have to listen to it to make sure, you know that it went on their okay. He was a little more animated [than when involved in routine lessons without the computer]. (Postsession Question #4)

**Part 3: Gardner's (1993) multiple intelligences.** Postproject item #3 involved drawing out the participants' responses by allowing the researcher to ask additional probing questions: Does the photo-story process access the strengths of your student's learning styles in communication (i.e., Gardner's Multiple Intelligences)? How does the digital photo-story process address the weaknesses of your student's abilities in communication in relation to having a weak ToM (i.e., the inability to understand other's feelings), WCC (i.e., unable to see the big picture/focus on details), and weak EF (i.e., unable to organize or strategize solutions)? The researcher read and analyzed the interview transcripts to identify emerging categories, general themes, and emerging themes. Each category and the related response were color-coded through the use of highlighting and handwritten codes. Tables 11, 12, 13, 14, and 15 present the determined

themes through a selected representative participant response related to Gardner's (1993) nine (i.e., the expanded categories) multiple intelligences.

**Case #1.** The researcher observed and video recorded the teacher's lessons with the student. During the making of the digital photo story, the researcher observed Case #1 and her 6-year-old male student utilize the digital photo-story tool to create a social story to indicate appropriate actions indicative of Whole Body Listening (Truesdale, 1990). Case #1 provided the researcher information related to the research for Whole Body Listening. Truesdale created Whole Body Listening as a social skills program that provides ways to teach children the abstract ideas that their eyes, hands, brains, ears, and whole bodies communicate and affect the people around them. Case #1 took photos of the student pointing to the respective body parts to be noted in the photo story. The photos were uploaded into the computer and downloaded into the photo-story tool. The student independently used the keyboard to type a sentence on each picture corresponding to the body part and the correct "listening" response (e.g., My eyes are looking; My ears are listening; My brain is thinking). This process was completed on day 1 of the lesson.

On day 2, the student used the microphone to record reading the sentence on each photo. The teacher and student edited the audio (rerecorded where the audio was unclear or too soft). The student selected the background music from the photo-story music library and added the song to the story. The student and teacher previewed the final product. The student agreed to allow his peers to watch the story. The whole class viewed the video and the student was visibly excited while the story played. Table 11 is populated with the represented responses with connections to Gardner's (1993) multiple intelligences obtained from the postproject interview and observations of the making of

the photo story for Case #1.

Table 11

*Multiple Intelligences and the Digital Photo Story Case #1*

Intelligence	Case #1 Participant's Connection	
	Interview (I)	Observed (O)
Verbal-Linguistic Intelligence	He wouldn't read what he had written fluently--and then he would say, "Ohhh, I need help." ---which was good because he doesn't often ask for help. Yeah, so it really prompted him to step up, I'm gonna say. (I), (O)	
Mathematical-Logical Intelligence	I know that he's interested in the computer and he's beginning to navigate independently when it's choice time and he can go on the computer. He remembers his login, name and all that so I thought well he would be a great one to practice some of those skills with in the photo story. (I), (O)	
Musical Intelligence	At the completion of the story, the student and teacher selected a song from the photo-story music library. He listened to five songs before selecting the final one. (O)	
Visual-Spatial Intelligence	use actual photos of them. I think that that really pulls . . . whether they've drawn something and we take a picture of it or I think it really pulled this particular boy in by having him in the picture you know, because they all like looking in the mirror and look at themselves. To me, this is hilarious . . . just that mirror image--I would definitely do that again somehow . . . either their work or actual photos of them. (I), (O)	
Bodily-Kinesthetic Intelligence	He did the whole thing we went back and corrected like when he was talking into the microphone he wanted to put the microphone up on his mouth. (I) The student sat up to the computer, fully engaged throughout the lesson. He was able to use the mouse and keyboard. He wrote out the sentences and clicked on the record button at appropriate times. (O)	
Interpersonal Intelligence	Student and teacher are side by side in front of the computer. Case #1: "Now, when you have to record. You are going to read what it says. You're going to click the red button." Student reads, "My eyes are looking." Case #1 says, "Okay, now preview it and see if we need to fix it." [referring to the audio recording]. Student clicks to preview [only student can hear sound because of the headphones]. Case #1 is smiling at student and asks, "Can you hear yourself?" Student answers, "Yes." Case #1 says, "Alright, you need to hit stop." Student looks at screen, sees next slide and reads, "My ears are listening." Case #1 says, "Oh wait, we didn't do that yet." Student is trying to click on a different slide. Case #1: "Wait, stop that." Case #1 is pointing to the screen and stating, "click on the first picture." Student clicks on second one. He says, "Oh, I need some help." (O)	
Intrapersonal Intelligence	I asked him if he would like to show other people and he's usually kind of backwards that way, but he said, "Yes" and so, he's let other people come and watch it [the finished photo story]. (I)	
Naturalist Intelligence	Not addressed.	
Existential Intelligence	Not addressed.	

Table 11 presented Case #1's noted connections with the digital photo story and

her student to Gardner's (1993) multiple intelligences. Case #1 utilized seven of the nine intelligences.

**Case #2.** The researcher observed and video recorded the teacher's lessons with the student. Case #2 and her 11-year-old male student elected to do a whole-class photo story using the sentence prompt, "I am a good friend because I am" (student answers). The researcher had parent permission for the designated student, so the observation of the selected student was short because the child participated on only one slide of the story. However, the researcher was able to observe the student watching classmates complete their slides and view the completed project.

Case #2 took photos of each child in her classroom and uploaded the photos in the photo-story tool, and each student took turns typing their sentence onto the photo. Case #2's selected participating student was able to compose and write his sentence directly onto the picture in the photo-story tool and independently read the sentence. Case #2 noted the student had made photo stories several times. She described the experience when the student first started making the stories:

But on a computer, [the student] is having to keyboard and we're having to use the microphone . . . so there's multiple steps. He's having to use more thinking to be able to complete the story. In the beginning he was pretty resistant to it because it seemed like a lot of work. But, once he realized the reward and the product, that he had his own movie he really has become . . . he really enjoys doing them now. (Case #2 Postproject Interview Question #5 response)

Case #2 noted an overarching connection of the digital photo-story tool to Gardner's (1993) multiple intelligences, noting, "because of the length of the process and all the different pieces that are involved, the kids are getting to experience the content, whatever

it may be, in multiple ways” (Postproject Interview Question #3). She further noted,

We’ve used photo story and we’ve also tried a variety of other formats, or apps, too, and I found that photo story is all encompassing. You can do anything with it that you want and it allows the students to gain multiple technology skills instead of, as opposed to doing it on the iPad—you know, iPads are a little more simple—so they’re not having to interact with it as much. (Case #2 Postproject Interview Question #5)

Table 12 is populated with responses with connections to Gardner’s (1993) multiple intelligences obtained from the postproject interview and observations of the making of the photo story for Case #2.

Table 12

*Multiple Intelligences and the Digital Photo Story Case #2*

Intelligence	Case #2 Participant's Connection	
	Interview (I)	Observed (O)
Verbal-Linguistic Intelligence	There's critical thinking involved when you're coming up with the story and then when you have to take the pictures of the various visuals-especially if the kids are having other kids in their shots. (I); And then , you know, there's the writing component. (I); He's learning how to keyboard so he goes page by page and we try to keep it to one sentence per photo so it's easy for him to keep up with. He'll type . . . then we do all the reading at the same time. We practice read several times before we actually record the reading. (I)	
Mathematical-Logical Intelligence	There's multiple steps. He's having to use more thinking to be able to complete the story. (I), (O)	
Musical Intelligence	At the completion of the story, the whole class and teacher selected a song from the photo-story music library. They listened to six songs before selecting the final one. (O); there's music involved at times, and then the pacing of everything so that the timing [is right]. (I), (O)	
Visual-Spatial Intelligence	They see themselves up on the screen. So, it's really powerful especially if it is even a social story, you know, the modeling that's there and they're seeing that they're doing everything the right way. It just completely reinforces all those skills. (I), (O)	
Bodily-Kinesthetic Intelligence	[The student] is one of those kids that before he did things like this, he wasn't able to sustain attention for more than five minutes on task. But, he will sit and work on one of these stories for up to 30 minutes. (I), (O)	
Interpersonal Intelligence	It's always really exciting when somebody finishes a story because they know they're going to get to share it with their friends. And, I've seen across the board that even-regardless of how long the story is or what it's about, the child's confidence that wrote the story they just are beaming the whole time. (I), (O)	
Intrapersonal Intelligence	With this particular child-try to focus him more directly on something related to his life. He likes to think of things that are very creative. But he needs more social skills success. So we would definitely try to reign him in to something like that. (I)	
Naturalist Intelligence	Not addressed.	
Existential Intelligence	Not addressed.	

Table 12 presented Case #2's noted connections with the digital photo story and her student to Gardner's (1993) multiple intelligences. Case #2 utilized seven of the nine intelligences.

**Case #3.** The teacher and her 6-year-old male student elected to do a science/nature photo story using the student-selected topic: “deer.” The researcher observed and video recorded the teacher’s lessons with the student. Case #3 noted the student loves animals and nature, so Case #3 and the student searched for various fair use internet pictures of deer (i.e., a male deer, a female deer, a baby deer, deer eating, deer running and jumping, and a diagram of a deer with labels of specific parts). The teacher loaded the photos into the photo-story tool. The student was not able to use the keyboard (does not yet have the skill) to type sentences on the photos, so while the student described something related to the photo, the teacher typed the sentence on the photo. The sentences were simple: A male deer is called a buck (first sentence). A female deer is called a doe (second sentence). This process was completed on day 1 of the lesson.

On day 2, the teacher managed the microphone and record button while the student sat next to her and read the sentence on one slide at a time. Case #3 provided ongoing and direct feedback for the student to “speak louder” or “slow down” and “you read that well.” The student and teacher previewed the story together after adjustments had been made (rerecorded two slides’ audio because the sound was too soft). The teacher and student previewed music and selected a background song and finalized the story. When the teacher played the movie (the completed photo story), the student smiled and watched the story without looking away. The movie was then showed to the whole class and students sat quietly watching and listening to the story. Table 13 is populated with responses with connections to Gardner’s (1993) multiple intelligences obtained from the postproject interview and observations of the making of the photo story for Case #3.

Table 13

*Multiple Intelligences and the Digital Photo Story Case #3*

Intelligence	Case #3 Participant's Connection	
	Interview (I)	Observed (O)
Verbal-Linguistic Intelligence	[It] also addressed areas of weakness for him because when he was able to listen back to the story he..and I gave him feedback about voice volume and clarity-then he was able to address those things..he could kind of hear what parts of communication maybe weren't so good and responded to my feedback and he corrected those things when I prompted him to do so. (I); [As] we were going through recording I was able to give him direct feedback on his reading and then when we watched it back, I also followed up by asking him some questions about some facts on the photo story. (I), (O)	
Mathematical-Logical Intelligence	Not addressed.	
Musical Intelligence	Teacher and student selected the song for the background music. (O)	
Visual-Spatial Intelligence	Then we looked at pictures that kind of corresponded to each one of the facts and the student helped me choose photos that he wanted to include in his photo story. (I), (O)	
Bodily-Kinesthetic Intelligence	The student sat up to the computer, fully engaged throughout the lesson. The student rocked his body and smiled and as he listened to his voice, he would smile and audibly gasp. (O),	
Interpersonal Intelligence	[Social skills] definitely it increased..since it was highly motivating I think the student engagement and the activity was offset the weakness for this particular student-- joint attention and ..like that. and attending to something with me. (I)	
Intrapersonal Intelligence	Being able to share his story with other students and feelings, you know, like he's showing something that he did and felt and in that in another way kind of plays to the social skills piece of it and being able to share something that he created and something that he is proud of..with others. (I)	
Naturalist Intelligence	[Noting the choice of the topic on deer] . . . we were able to find a topic that he was interested in so it was highly motivating for him. (I), (O)	
Existential Intelligence	Not addressed.	

Table 13 presented Case #3's noted connections with the digital photo story and her student to Gardner's (1993) multiple intelligences. Case #3 utilized seven of the nine intelligences.

**Case #4.** Case #4 elected to do a photo story with her 12-year-old male student

using personal family photos provided by the father of the student. The teacher explained to the researcher (who was on-site to video record and observe the photo-story lesson), that the student's family had recently taken a trip to Niagara Falls. For the purpose of making the photo story, the father provided the teacher with several photos taken on the trip and various photos of the student at a younger age.

The researcher observed and video recorded the teacher's lessons with the student. To begin the lesson, the teacher uploaded the selected photos into the photo-story tool. The student was not able to use the keyboard (had not acquired the skill) to type sentences on the photos. The student was able to verbalize one word to describe something or someone in each photo (e.g., Daddy; Mommy; water; computer). The teacher typed the word onto the photo. This process was completed on day 1 of the lesson.

On day 2, the teacher managed the microphone and record button while the student sat next to her and read the word on one slide at a time. Case #4 provided ongoing and direct feedback for the student to "speak louder" or "slow down" and "you read that well." The student and teacher previewed the story after adjustments had been made (rerecorded over several slides because the student's voice was too soft). The teacher and student previewed music, selected a background song, and finalized the story. When the teacher played the completed photo-story movie, the student smiled, sat with his knees pulled up, and watched the story without looking away. The movie was then showed to the whole class and students sat quietly watching and listening to the story. Table 14 is populated with responses with connections to Gardner's (1993) multiple intelligences obtained from the postproject interview and observations of the making of the photo story for Case #4.

Table 14

*Multiple Intelligences and the Digital Photo Story Case #4*

Intelligence	Case #4 Participant's Connection	
	Interview (I)	Observed (O)
Verbal-Linguistic Intelligence	When I got the pictures, then I started going over what kind of vocabulary we could put with it. He's not much of a verbal student, so we--I thought it would be a good idea to, you know, get things that he could relate to and words that he would want to say. (I), (O)	
Mathematical-Logical Intelligence	He helped me mainly with the recording and he did help me a little bit with the transitions. He picked which ones [the transitions] he wanted his pictures to do. We definitely got into our own groove of things once he figured out, you know, how to go from one slide to another. He was more with the process. He understood that each time we were going to have to record and that we were going to have to listen to it to make sure, you know that it went on their okay. (I), (O)	
Musical Intelligence	At the completion of the story, the student and teacher selected a song from the photo-story music library. He listened to three songs before selecting the final one. (O)	
Visual-Spatial Intelligence	I had to get pictures of the student first. When I got the pictures, then I started going over what kind of vocabulary we could put with it. If there were pictures of him in the story then maybe he would be more motivated to look at what we were doing . . . it was something new on each picture and it had something to do..I was able to make it so he was in the picture as well. I think that really held his interest. (I), (O)	
Bodily-Kinesthetic Intelligence	The student sat up to the computer, engaged throughout the lesson. He put his hands down (from his mouth) and kept the headphones on to speak into the microphone. He leaned into the pictures when he saw his father, mother and recognized himself; smiled and giggled. (O)	
Interpersonal Intelligence	The student viewed the story with the class and teacher. He did not disrupt the process and sat quietly while all watched. [This student can exhibit disruptive behaviors]. (I), (O)	
Intrapersonal Intelligence	He was a little more animated. (I), (O)	
Naturalist Intelligence	Not addressed.	
Existential Intelligence	Not addressed.	

Table 14 presented Case #4's noted connections with the digital photo story and her student to Gardner's (1993) multiple intelligences. Case #4 utilized seven of the nine intelligences.

**Case #5.** On day 1 of the lesson to create the photo story, the researcher arrived

at the middle school to observe and video record the lesson and discovered the teacher had taken her whole class outside to take pictures. The teacher explained she had elected to do a photo story using photos of each student in the class demonstrating an emotion related to the Zones of Regulation (Kuypers, 2015). The teacher took four pictures of the 12-year-old female student who had received parent consent to be in the study. The teacher provided the researcher information on The Zones of Regulation curriculum developed by Kuypers (2015). Kuypers created The Zones of Regulation as a method of “provid[ing] strategies to teach students to become more aware of, and independent in controlling their emotions and impulses, managing their sensory needs, and improving their ability to problem solve conflicts” (para. 2).

The Zones of Regulation are four zones, each defined by a color and specific emotions assigned to the color. The red zone is used to describe intense emotions (i.e., anger, rage, explosive behavior, devastation, terror). The yellow zone is also for heightened emotions but ones where the person may exhibit more control (i.e., stress, frustration, anxiety, excitement, silliness, nervousness). The blue zone is used to describe low states of alertness (i.e., tired, sick, bored). The green zone is used to describe a calm state of alertness (i.e., happy, focused, content). Kuypers (2015) stated, “By using cognitive behavior management, the students learn how to self-monitor and reflect on the effectiveness of their regulation strategies” (para. 8). The intent of teaching students about the zones is to increase the student’s ability “to move away from staff prompts to regulate and to assume personal responsibility in self-regulation” (Kuypers, 2015, para. 7).

Case #5 took photos of each child in her classroom using whole-body expression to denote an emotion from each of the four zones of regulation. The teacher then

uploaded the photos in the photo-story tool. The researcher had parent permission for the designated student, so the observation of the selected student was short because the child participated on only four slides of the story. However, the researcher was able to observe the student watching classmates complete their slides and view the completed project.

Each student who was able to do so took turns typing their sentence onto the photo. Case #5's selected participating student was able to compose a sentence but was unable to write the sentence directly onto the picture in the photo-story tool. The teacher typed the sentence on the participating student's photos. Case #5 noted the student had made photo stories before when in elementary school and was excited to be making a story again. Preparing the slides and written sentences were completed on day 1 of the photo-story session.

On day 2, the teacher managed the microphone and record button while the student sat next to her and read the sentences one slide at a time. Case #5 provided ongoing and direct feedback for the student to read the scripted words in the sentences. The student and teacher previewed the story together. The teacher and student previewed music and selected a background song and finalized the story. When the teacher played the movie (the completed photo story), the student smiled and covered her eyes when her photos and voice were showing in the movie. The movie was then showed to the whole class and students sat quietly watching and listening to the story. Once again, the student smiled and covered her eyes when her photos and voice were showing in the movie.

Case #5 addressed Gardner's (1993) multiple intelligences when discussing the advantages of using the photo story:

[It] definitely incorporates the visual components and auditory components of hearing their voices as well as kind of a tactile thing if they do it themselves as far

as recording and even taking pictures or something like that. It's very interactive. And I think it connects with them on another level too, like on a social level because it is something that they're enjoying because they love computers and things like that. (Case #5 Postproject Interview Question #8)

Table 15 is populated with responses with connections to Gardner's (1993) multiple intelligences obtained from the postproject interview and observations of the making of the photo story for Case #5.

Table 15

*Multiple Intelligences and the Digital Photo Story Case #5*

Intelligence	Case #5 Participant's Connection	
	Interview (I)	Observed (O)
Verbal-Linguistic Intelligence	[The student] exhibited behaviors..that were as far as like, when she does read out loud--she doesn't want anyone to watch her do it. She--only me . . . so . . . that was normal. But I did see her excitement when she listened to her own voice in the headphones, that was something I had not seen. (I), (O)	
Mathematical-Logical Intelligence	Not addressed.	
Musical Intelligence	At the completion of the story, the music was previewed from the photo-story music library. She listened to the songs while the teacher selected the final one. (O)	
Visual-Spatial Intelligence	I specifically did it with the social skills and the Zones of Regulation. We do a photo shoot and each does child does a picture of angry which is in the red zone--and then frustrated-- yellow zone, happy in the green zone and like tired in the blue zone. (I), (O)	
Bodily-Kinesthetic Intelligence	Case #5 [taking photos of student demonstrating requested emotion] says "[Student] show me how you look when you are in the green zone." Student puts hands on lightly head and makes happy face. Case #5 says, "[Student] show me how you look when you are in the red zone." Student holds up right hand and makes fist and frowns. (O)	
Interpersonal Intelligence	So each kid had a different picture for each of the friend's zones--so I went ahead and uploaded the pictures into the photo story and then I had--for the writing--I had like I'm in the blue zone when I feel tired . . . or I'm in the red zone when I feel angry. So, those were the things that each child read when they recorded and then we watched it altogether as a class. (I) The student did not disrupt the process, smiled and covered her eyes when her parts of the story came into view. (I), (O)	
Intrapersonal Intelligence	But basically, the one student that I did with this experience..she was a bit shy to be in front of-- she covered her eyes when she saw herself. she was very shy when she was recording it-herself. She had every one turn around so they weren't watching her when she spoke because she is like a selective mute type so she doesn't really want to talk in front of people when they're watching, but she had no problem recording it and when she listened back to make sure it sounded good, she you know, had a smile on her face and lighted up. (I), (O)	
Naturalist Intelligence	Not addressed.	
Existential Intelligence	Not addressed.	

Table 15 presented Case #5's noted connections with the digital photo story and her student to Gardner's (1993) multiple intelligences. Case #5 utilized seven of the nine

intelligences.

### **Researcher's Summary Comments**

The results obtained from the data collection indicated that the participants believe that the digital photo-story process had a positive impact on the communication and social skills of the selected students with ASD. The comments made by the participants included emphasis on the connections the digital photo-story processes had with EBPs such as activating prior knowledge, joint attention, TAIL, repeated readings, social stories, visual cues, use of a prompt hierarchy, feedback as reinforcement, and promoting appropriate communication and social behavior. All five participants reported an increase in their ability and confidence to use the digital photo-story process and indicated they would continue to use the digital photo story as a teaching strategy.

### **Summary**

Chapter 4 presented the findings and results of the data collected from the participant informational protocols, pre and postproject open-ended interviews, and observations. The qualitative method, multiple case study design was used to collect data to examine teacher perceptions of the impact of digital photo stories used as an instructional strategy with students with ASD.

Gardner's (1993) theory of multiple intelligences was evident as a conceptual framework with respect to the comments made by the participants. Noted within responses were references to intrapersonal intelligence. For example, the participants discussed the use of personal photos which helped the student with ASD to visually and intrapersonally respond to the photo-story strategy.

Interpersonal intelligence in a child with ASD means that he or she understands the intentions and motivations of others and directly relates to ToM. The data obtained

from the perceptions and opinions of the participants (including the observational data) were significant to this study because they addressed the three RQs. Overall, the digital photo-story process was perceived positively and was considered by the participating teachers to be an effective instructional strategy for addressing needed communication and social skills in children with ASD.

Chapter 5 presents a summary of the results and a discussion of the findings. Additionally, implications of the research, recommendations for future research, and limitations of the study highlight the completion of this study.

## **Chapter 5: Discussions, Conclusions, and Recommendations**

### **Summary**

Children with ASD may exhibit absent, delayed or atypical communication skills, and poorly developed social skills and may have delayed cognitive skills (Autism Fact Sheet, 2015; Tager-Flusberg et al., 2005). The identified cognitive delays and atypical behaviors of children with ASD interfere with their ability to acquire communication and social skills within the general education environment with their typically developing peers (Luckevich, 2008; Williams et al., 2005). Children with ASD require explicit instruction most often in the identified areas of communication skills and social skills (Boesch et al., 2013; Bondy, 2001; NAC, 2009). Identifying effective instructional strategies to address communication and social skill deficits in children with ASD continues to remain a priority in the ongoing research on ASD (NAC, 2009).

In the early 2000s, the digital photo story emerged as a classroom strategy for students to create digital storytelling and learn new technology (More, 2008; Salpeter, 2005). Research studies focusing on the digital photo story as an intervention for individuals with ASD are rare, partly due to the digital photo story being a fairly new tool. The digital photo-story process incorporates EBPs for children with ASD including repeated readings, joint attention, activating prior knowledge, visual cues, social stories, TAIL, video modeling, and structured language training activities.

The purpose of this qualitative method, multiple case design study was to examine through open-ended interviews and observations teachers' use of digital photo stories as an instructional tool and consider teacher perceptions of the impact of the digital photo story on communication and social skills for children with ASD. The theoretical construct was based on the research indicating children with ASD (Pennington

et al., 2010; Pennington & Delano, 2012; Whalon et al., 2009) require specialized teaching methods that are tailored to meet the child's individual needs to address the lack of ToM (Baron-Cohen et al., 1985), WCC (Happe' & Frith, 2006), and weak executive function (Frith & Happe', 1994). The information obtained from the experiences, perceptions, and observations of the participating teachers while working with the students with ASD contributed to this theoretical construct. Gardner's (1993) theory of multiple intelligences was used as the conceptual framework for this study.

This study included five highly qualified female teachers who taught in Intensive Intervention self-contained special education classrooms. Three of the teachers taught at an elementary school (kindergarten through fifth grades) and two teachers taught at the middle-school level (sixth through eighth grades). Participants, who were all teachers of students with ASD, were purposefully selected based on willingness to take part in the study. Each teacher selected a student with ASD who received parent consent to participate in the study.

The study was concerned with the teacher perceptions of the impact of the digital photo story on communication and social skills of their students with ASD. Three RQs were developed and guided the data collection process which included observations and pre and postproject interviews with teachers of children with ASD. The guiding question for this study was, "How does the use of digital photo stories as an instructional tool impact teacher perceptions of students with ASD?" This study investigated three RQs to support or nullify the guiding question.

RQ1. How do various teachers approach the experience of utilizing digital photo stories with students with ASD?

RQ2. What are teacher perceptions of the impact of the digital photo-story

production experience on communication skills for their students with ASD?

RQ3. What are teacher perceptions of impact of the digital photo-story production experience on social skills for their students with ASD?

### **Data Collected**

Qualitative data were collected through teacher-completed informational protocols, audio-recorded pre and postproject open-ended interviews, video-recorded observations, and a reflexive journal maintained by the researcher. Digital photo-story sessions (i.e., the process required by the teacher to create and complete a story with the student) were observed and video recorded to capture the interactions and reactions of the participating teachers and the selected participating students with ASD.

All five teachers met at individually scheduled meetings, allowing the researcher to explain the purpose of the study and answer questions regarding the study. All five teachers verbally indicated that they were willing to participate and signed an informed consent form. The teachers completed the teacher informational protocol form to provide background information relevant to the teacher's experience as a teacher and preproject knowledge of the digital photo-story process. The five participants' teaching experience ranged from 4-14 years, and specific instruction with students with ASD ranged from 4-11 years. All five teachers indicated they knew what a digital photo story was and had watched student photo stories. However, four of the five participants indicated they had never made a digital photo story. One participant noted she had made many photo stories over the past 4 years of teaching with her students with ASD.

The five teachers were provided an organized training on using the digital photo story by a district computer instructor at each participant's respective site. The training

was held at the participant's site to ensure the computers and microphones necessary to complete a digital photo story were available and operating. Each teacher had the opportunity to practice making a sample photo story with the trainer. The trainer was on call for the teachers throughout the research project. None of the five participants contacted the trainer for further support. After the initial training, each teacher was able to independently complete the digital photo-story project with the student.

Each teacher selected a student with ASD currently on her caseload to participate in the digital photo-story process. The researcher and the teacher made contact with the parent of the selected student and obtained district-approved informed consent allowing the child to participate in the research.

The researcher arranged the pre and postproject interviews and observation schedules with the respective teachers. Pre and postproject interviews were conducted individually at the participating teachers' schools. Preproject interviews provided background information on the teacher, student, and the teacher's initial LoU with the digital photo-story tool. Video-recorded observations of the photo-story process were conducted in the participating teacher's classroom. Two observations had to be rescheduled due to a participant's family emergency. The data were collected from July 2015 to September 2015. Postproject (i.e., after the teacher had created and completed a digital photo story with the student) interviews were conducted to obtain teacher perceptions of the impact the digital photo story had on communication and social skills with their student with ASD. The postproject interviews also considered the teachers' thoughts on whether the digital photo-story tool was an effective strategy for students with ASD and how the teachers perceived their postproject LoU with the tool.

## **Data Analysis**

Analysis of the data was completed by organizing the findings into three parts. Part 1 consisted of general information from the participants in regards to the teacher information protocol (Appendix D) and Hall and Hord's (2015) theory of the impact of the participants' LoU with the strategy before and after implementation of the digital photo-story tool. Part 2 consisted of a narrative analysis, tables populated with relevant pre and postproject interview responses, and selected observation field notes of the participants' photo-story sessions with their respective students as the notes pertained to each of the three RQs. Part 3 consisted of an analysis of participant responses to the postproject interview protocols related to the theoretical underpinnings of Gardner's (1983, 1993) Theory of Multiple Intelligences. Open coding of the interview responses and observation data reflected participants' perceptions of Gardner's (1993) nine multiple intelligences accessed by the student while utilizing the strategy.

Trustworthiness of the research was achieved through various methods including triangulation, member checking, and peer debriefing. Interview and observation transcripts were provided to each participant for member checking to heighten the validity of the findings. A peer debriefer reviewed and analyzed the interview responses, the transcripts, and the processes and themes attributed to the qualitative study data analysis. The researcher cross-referenced data from the observations and interviews with the themes and patterns to establish dependability (the qualitative counterpart to reliability) of the research findings. The resulting qualitative data collected on teacher perceptions of the use of the digital photo story as a tool and its impact on the communication and social skills of children with ASD are analyzed and discussed.

## Findings

The findings from the study are a result of the data collection from the informational protocol, interviews, and observations. The findings are presented in relation to the three RQs addressed in Parts 1, 2, and 3.

**Part 1: Informational protocol from the participants.** Participants completed the information protocol to denote instructional practices they currently use in their teaching. The collected data indicated four teachers had never used the digital photo story as an instructional strategy. Only Case #2 indicated that the digital photo story was a strategy she used often with her students with ASD. All five teachers indicated “frequent” or “often” use with the EBPs of activating prior knowledge, joint attention, naturalistic interventions, technology assisted instruction, and visual cues. These EBPs are embedded strategies utilized in the digital photo-story production process (More, 2008; Trent, 2012). Case #2 indicated she frequently used direct instruction and guided reading as strategies for her students with ASD.

**Part 2: Analysis of postproject interview questions, journal entries, video recordings and observation field notes.** The narrative analysis examined the researcher’s review of the open-coding categories of the postproject interview questions (Appendix F), Reflexive Journal entries (Appendix I), and video-recorded observations and field notes of each participant utilizing the digital photo-story tool with his/her respective student (Appendix J). The three RQs provided the structure for the analysis of the collected data.

**RQ1.** How do various teachers approach the experience of utilizing digital photo stories with students with ASD? Two emergent themes discovered by the open coding of pre and postproject interview questions were the participants’ perceived LoU with the

digital photo-story tool before and after using the tool for the project and participant concerns about the process.

**LoU.** In the preproject interview, Case #1, 3, 4, and 5 indicated their LoU with the digital photo story to be that of a novice and at Hall and Hord's (2015) LoU of "Level I Orientation: The user is taking the initiative to learn more about the innovation" (p. 108). Case #2 indicated her LoU with the digital photo-story tool to be at Hall and Hord's LoU of "IVB Refinement: The user is making changes to increase outcomes" (p. 108). The four teachers at per-session LoU Level I indicated initial concerns with using the tool effectively and efficiently with the student. In the postproject interview, Case #s 1, 3, 4, and 5 indicated their perceived LoU had increased from Level I Orientation to "Level II Preparation: The user has definite plans to begin using the innovation" and "Level III Mechanical Use: The user is making changes to better organize use of the innovation" (Hall & Hord, 2015, p. 108). All four teachers who expressed initial concerns of using the tool well dismissed the concerns after completing the photo-story process with their students. Case #1 (personal communication, August 27, 2015) noted, "My worst fears were not realized. The process went smoother than I could have imagined."

After using the photo-story tool for the research project, all five participants increased their perceived LoU one to two stages on Hall and Hord's (2015) determined LoU stages. All five participants discussed their willingness and desire to continue to use the digital photo story as a strategy. Participants reported an increase in their ability and confidence to use the digital photo-story process and indicated they would continue to use the digital photo story as a teaching strategy. Case #3 summed up her experience with the digital photo story, stating,

I think it's just another tool that I'll be able to add to my tool kit. And as I kind of mentioned in some earlier questions, I think the more that I use it and the more comfortable I get with it I could really use it to meet the unique needs of each student in my class. All those different needs . . . I am already kind of forming in my brain how I could use it for like word practice for one student, and then for another student it could be used . . . to work on higher level comprehension skill or it could be used specifically for students demonstrating their understanding of science concepts . . . there's just so many different uses that I could see using photo story for . . . and I think it's a tool that I'll definitely be able to use a lot and an effective tool that I'll be able to use a lot in my classroom from here on out.

**Implications of LoU.** The theoretical framework of Hall and Hord's (2015) LoU to assess the participating teachers' pre and postproject knowledge and skills of using the new technology of the digital photo-story tool was important to consider when determining next steps for these teachers to continue to use the tool and for new teachers to try the tool. Addressing individuals' perceptions and concerns about their ability to successfully implement a change or use an innovation is critical in order for the educators to receive appropriate assistance and support to adopt the tool (Hall & Hord, 2015). Hall and Hord stated, "[t]he three major ways in which LoU can be employed are (a) planning for the next steps in a change process, (b) facilitating the change process, and (c) conducting evaluation and research studies" (p. 119).

The implications of considering LoU of the teachers in this study addressed planning for the next steps and facilitating the change process. Findings of the participants' LoU present a forum for discussion of the types of professional development that might be provided to a new group of educators who may find the digital photo story

an effective teaching strategy. For example, the participating teachers in the study indicated initial fears of not being smooth users or competent with the technology. These fears could be alleviated with hands-on learning experiences, guided trainings, manuals, and other materials of how to use the digital photo-story tool or any new technology. The trainings would allow teachers to be at the minimum of an entry level of LoU III Mechanical Use (Hall & Hord, 2015, p. 108) when they would make their first projects with the tool. Pairing LoU III users with LoU IVa Routine and Level IVb Refinement users in small professional learning communities (PLCs) would allow the LoU III users to ask questions and practice while allowing IVa and IVb users to be the “professionals”—which may increase motivation to “observe and wonder about how well their use of the innovation is working for the benefit of their [students]” (Hall & Hord, 2015, p. 111).

Ongoing data collection of teacher implementation of the digital photo-story strategy could be obtained by walkthroughs, continued LoU One-Legged Interviews (Hall & Hord, 2015), and information culled from discussions to allow judgments to be made regarding individuals’ LoU with the new technology. Addressing concerns by providing appropriate support would allow additional lifts for struggling users to increase LoU skills. It would be beneficial to have deeper conversations with these educators to determine what roadblocks might still be preventing them from using the technology at a LoU IVa Routine—more smoothly and comfortably. If these types of data collection did not provide sufficient information to assess LoU, it might be necessary to take more rigorous steps to determine how staff are utilizing the digital photo-story tool.

It would be exciting to discover certain educators who may reach LoU V Integration—using the technology with “related activities of colleagues to achieve a collective impact on [the students]” (Hall & Hord, p. 108). These staff could share at

PLCs or lead additional trainings to benefit and meet determined needs of mechanical-level users.

Technology-savvy educators may quickly rise to the LoU VI Renewal—where a process of examination for “new developments in the field . . . and explorat[ion] [of] new goals for self and the system” (Hall & Hord, 2015, p. 108) begins to emerge while using the digital photo-story tool. Staff at this LoU may present exciting and innovative alternative ways to use the technology. Hall and Hord (2015) noted this group must also be monitored to check that the integrity of the original purpose of introducing the new technology is maintained. To be effective, the digital photo-story tool should include the EBPs as evidenced by the findings in this study (e.g., activating prior knowledge, joint attention, visual cues, repeated readings) and access multiple intelligences (e.g., verbal/linguistic, logical, musical, visual).

Determining teachers’ LoU is a function that can be applied on a regular basis by engaging in brief interviews, observing teachers utilizing the digital photo story, and by using more in-depth interview processes. Organizing activities that include interventions, supports, sharing, and time must be developed in conjunction with the educators’ LoU. This type of strategic planning may result in the users gradually becoming highly skilled at using the new technology, providing the educator with an effective instructional strategy for students with ASD.

**RQ2. What are teacher perceptions of the impact of the digital photo-story production experience on communication skills for their students with ASD?** This RQ was addressed through the pre and postproject interviews and from the observation field notes of the video-recorded sessions. All five teachers indicated the digital photo story had a positive impact in their student’s verbal and communication skills. Increased

verbal activity was noted as students used unsolicited verbal requests and comments during the process, students interacted with the teacher at a noted increased level compared to paper and pencil lessons, students emitted sounds of excitement and expression previously not used during “reading” lessons, and students utilized repeated readings without prompting from the teacher. No negative impacts on communication were discussed or noted by any of the teachers.

**Implications of the digital photo-story production process and communication.** Chapter 2 addressed the research indicating individuals with ASD may exhibit absent, delayed, or atypical communication skills (Autism Fact Sheet, 2015; Tager-Flusberg et al., 2005). The identified cognitive delays and atypical behaviors of children with ASD interfere with their ability to learn communication within the general education environment with their typically developing peers (Luckevich, 2008; Williams et al., 2005). Research findings indicated children with ASD require explicit instruction most often in the identified areas of communication skills and social skills (Boesch et al., 2013; Bondy, 2001; NAC, 2009). Educators, paraprofessionals, caretakers, and parents must be made aware of effective instructional strategies and learn to utilize the EBPs that have proved effective for maintaining or increasing communication skills in children with ASD (Karim, 2009; Marder & Fraser, 2012).

During the digital photo-story production process, the five participants in this study utilized the EBPs of activating prior knowledge, structured behavior strategies, joint attention activities, repeated readings, TAI, verbal modeling, visual cues, video modeling, and storytelling. The implications of these findings suggest the digital photo-story strategy presents as an effective tool utilizing multiple EBPs embedded in the instructional process of creating and completing the project.

The five participants' responses in the postproject interviews regarding future uses of the digital photo-story strategy indicated the perceived wide range of uses and the variety of topics that could be addressed through the digital photo-story process. Case #1 noted,

I know that we are going to be going a field trip and I think that would be a great way to take pictures of them while they're there . . . then come back and download the pictures and let them each narrate . . . participate in creating this digital [story] . . . remembering of what we did. You know, that's just one way. I'm sure there's lots and lots of other ways—but, that's just the one that comes to mind. (Postproject Interview Question #10)

Case #2 stated,

We've used photo story and we've also tried a variety of other formats, or apps, too, and I found that photo story is all encompassing. You can do anything with it that you want and it allows the students to gain multiple technology skills. (Postproject Interview Question #10)

Case #3 noted,

All those different needs . . . I am already kind of forming in my brain how I could use it for like word practice for one student, and then for another student it could be used, you know, to work on higher level comprehension skill or it could be used specifically for students demonstrating their understanding of science concepts . . . there's just so many different uses that I could see using [the] photo story for. (Postproject Interview Question #10)

Case #4 responded, "I found that . . . there's so many different things you can do with it, like, not every photo story's gonna be the same" (Postproject Interview Question #8).

Case #5 discussed uses of the digital photo story and stated,

The first thing that comes to my mind is like doing different books or actually if they wrote a story, then creating like a visual support . . . then having their own voice support what they've written. I think that would be a great way to incorporate it. (Postproject Interview Question #10)

The perceived wide range of uses and variety of topics able to be addressed through the use of the digital photo-story process suggests the tool would be an effective strategy to maintain or increase communication for the child with ASD. Student-specific enhanced instruction in communication would be embedded in the digital photo-story processes of discussing the selection of a preferred topic; providing photos of the child to solicit verbal responses; activating the child's prior knowledge by allowing the child to select photos; using joint attention activities to take turns to discuss the pictures, music, and the transitions, pan, and zoom features; increasing oral reading skills through repeated readings during audio recording; learning to monitor the range of voice and expression during audio recording; and providing wrap-up discussions after viewing the story specifically addressing expressive and receptive communication skills with peers.

The digital photo-story process lends itself to be readily modified and adapted to the child's level of ability to specifically address the determined strengths and weaknesses of the communication needs of the student. These findings imply the digital photo story is a versatile instructional strategy well-suited to impact the communication skills for children with ASD. Stevens (2011), discussing the uses of the digital photo-story strategy noted,

Learning environments aren't revolutionized by installing a few cool gadgets here and there. Far more important is the educator's role in employing today's

technology to make material accessible and engaging—in other words, encouraging students to create, communicate and collaborate in ways never before possible. (para. 3)

Ohler (2013), considering the digital photo story as a TAI to address increasing communication skills for students in regular education noted,

Students employ technology thoughtfully to enhance their reading, writing, speaking, listening and language use . . . they are familiar with the strengths and limitations of various technological tools and mediums and can select and use those best suited to their communication goals.

Students with ASD may not have the level of cognitive abilities of their peers in regular education but the digital photo-story strategy may be adapted to the skill level of the student to achieve the same outcome—enhanced communication.

The digital photo story may be used to address communication in the Common Core standards (Department of Public Instruction of NC, 2015). Hodgson (2012) described multiple ways to increase communication skills by connecting the digital photo-story process across the curriculum in connection with Common Core learning targets:

math (explain a concept); science (show an experiment); history (take on an alternative perspective of historical figure); produce video book trailers to entice peers to read a story; media companion to narrative writing; persuasive “how to” video project; family history project; tell the story of a community; use images, voice narration, music and (sometimes) motion to tell a story; incorporate storyboarding; and write a script using revision and production elements of the writing process. (para.1)

Hogdson (2012) and Trent (2012) discussed multiple ways the digital photo story could be used to promote communication (oral and written) in connection with the Anchor Standards of the Common Core (Department of Public Instruction of NC, 2015). Hogdson provided examples of lessons or activities that might be utilized with the digital photo story in connection with specific English Language Arts (ELA) anchor standards for the Common Core (Department of Public Instruction of NC, 2015):

ELA Anchor Standard Three: Write narratives to develop real or imagined experiences and events. Anchor Standard Six: Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others. Anchor Standard Seven: Conduct short as well as more sustained research projects. Anchor Standard Eight: Gather relevant information from multiple print and digital sources. Anchor Standard Ten: Write routinely over extended time frames . . . and shorter time frames . . . for a range of tasks, purposes and audiences. (para. 1)

Hogdson also provided suggestions of the digital photo story as a tool of technology for the integrated use into the writing curriculum such as “the use of audience to shape writing; use of voice; potential for narrative writing but also for presenting informational/expository/persuasive writing; and connections to digital/media literacy” (para. 1).

Exploring teacher perceptions of the impact of the digital photo-story production process on communication for students with ASD yielded findings that the strategy readily incorporates multiple EBPs and addresses multiple targeted communication skills. Professional development might be offered to educate teachers, paraprofessionals, and caregivers of the connections to the Common Core (Department of Public Instruction of

NC, 2015) and the range of instructional uses for increasing communication that may be incorporated within the digital photo-story production process (Hogdson, 2012; Ohler, 2013; Steven, 2011; Trent, 2012).

**RQ3. What are teacher perceptions of impact of the digital photo-story production experience on social skills for their students with ASD?** The pre and postproject interview responses indicated all five teachers perceived the digital photo-story process positively impacted social skills of the students with ASD. Increased efficacy of student social skills were noted in the heightened level of excitement and willingness of the students to allow (even requesting) others (i.e., peers and teachers) to watch the completed story; increased time on task for the joint attention lesson with the teacher (and in Case #2 and 5, other students); increased facial expressions and vocal sounds (gasps and ahhs); and an increased level of following teacher directions and requests during the process.

Case #1 described a positive social skill effect that occurred when her student completed the story:

He was game the whole way through and I was thrilled because truthfully I didn't know if he had the abilities that I hoped that he had and he proved to me that yes he did. So maybe I've been kind of not raising the bar for him enough. You know maybe I could have done this a lot sooner and he could be a lot further. But, another thing that is I asked him if he would like to show other people and he's usually kind of backwards that way, but he said, "Yes" and so, he's let other people come and watch it. [The photo story was then shown to his peers and the teachers in the class.] And I sent it to his family so I hope that they've been able to pull it up at home.

Case #5 discussed how her student responded positively to the photo-story lesson:

She [the participating student] is like a selective mute type so she doesn't really want to talk in front of people when they're watching, but she had no problem recording it [in front of the students] and when she listened back to make sure it sounded good, she you know, had a smile on her face and lighted up. I definitely saw that—I guess, one thing I did see new was their excitement of hearing their own voice—that was, that was cute.

### **Implications of the digital photo-story production process and social skills.**

Chapter 2 addressed the research indicating individuals with ASD demonstrate deficits in social skills and often avoid participating in social interactions (Autism Fact Sheet, 2015; Autism Speaks, 2014). Social skill deficits for individuals with ASD are characterized by the difficulties in sharing an attentional focus with others, avoidance of participating in social exchanges, and lack of ability for attending to the actions of others (Autism Fact Sheet, 2015; Baron-Cohen, 1995). Individuals with ASD may develop unconventional or inappropriate behaviors to compensate for delays in communication and social development that lead to exclusion (Autism Fact Sheet, 2015). Systematic, thoughtful planning is necessary to facilitate and develop adequate opportunities for successful interactions between individuals with ASD and others (Autism Fact Sheet, 2015; Autism Speaks, 2014; Karim, 2009).

The digital photo-story production process incorporates multiple EBPs for increasing social skills including behavioral interventions (i.e., strategies keeping the child focused on the project and teacher): joint attention, modeling, self-management techniques, video modeling, and visual cues (Hogdson, 2012; Ohler, 2013; Steven, 2011; Trent, 2012). The digital photo-story process incorporates the EBPs of story-based

interventions, scripting (i.e., providing the child with specific scripts to model expected language) and social stories (scripted personalized stories to facilitate changes in behaviors). The digital photo-story strategy's shared traits with EBPs suggest that utilizing the digital photo story as an instructional tool could strengthen social skills for a child with ASD.

Creating social stories with the digital photo-story strategy would enable the child with ASD to hear, see, and become part of the social story, allowing multiple intelligences to be accessed during the lesson. Stories may be supplemented with additional components from other EBPs (e.g., prompting, reinforcement, discussion, redirection). The digital photo-story production process might be used to target the child's specific behaviors interfering with positive social interactions. Photos of the child performing the correct behavior paired with descriptions of the situations specific to when the behaviors should occur would be the basis for the social story. The child, peers, and adults (e.g., teachers, paraprofessional, parents) viewing the completed digital photo-story video could discuss the appropriate behaviors providing a platform to increase social skills and communication.

Examining teacher perceptions of the impact of the digital photo-story production process on social skills for students with ASD yielded findings that the strategy readily incorporates multiple EBPs, addresses weaknesses in social skills, and promotes interactions with peers and teachers. Professional development might be offered to educate teachers, paraprofessionals, and caregivers of the range of instructional uses for increasing social skills that may be incorporated within the digital photo-story production process (Hogdson, 2012; Ohler, 2013; Steven, 2011; Trent, 2012).

## Theoretical Framework of Psychological Theories of Autism

Three psychological theories provided the basic theoretical framework for how children with ASD learn, communicate, and interact: delayed ToM (Baron-Cohen, 1995; Baron-Cohen et al., 1985; Premack & Woodruff, 1978), WCC (Frith & Happe', 1994), and impaired executive function (Baron-Cohen, 1995; Frith & Happe', 1994; Pellicano, 2012). Postproject interview discussions with the five teachers provided participant perceptions of the digital photo-story strategy's ability to address the delayed ToM, WCC, and impaired EF of students with ASD.

**Lack of ToM.** Baron-Cohen et al. (1985) described ToM as the ability of the individual to be able to infer the full range of mental states (i.e., desires, intentions, imagination, emotions, and others) that cause action. Baron-Cohen et al. noted children with ASD did not perform well on ToM tasks and did not have positive peer interactions. During the postproject interview questions, the five participants noted the digital photo-story process positively impacted the social skills of their students with ASD. All five teachers reported that their participating student, while viewing the completed photo-story movie with their classmates, became noticeably excited and animated towards their peers—demonstrating a small level of ToM not seen with other instructional strategies.

Case #5's shy student became atypically animated and sat with her peers outside the school on a bench while the teacher took photos of each of her students demonstrating an emotion for the Zones of Regulation (Kuypers, 2015) photo-story material. For Case #5's whole class viewing of the movie, the student realized her peers were watching and covered her eyes with her hands until her picture passed. This student also looked around at her peers to see if they were watching while the movie was playing. Each time the student's picture came on the screen, she first looked around at her peers and then

covered her eyes. Whether she was nervous to let her peers watch her or whether she was just nervous to see herself, this was an atypical response for this student who usually does not demonstrate emotions in front of others (as reported by the teacher during the postproject interview). The student's small action and reactions to the photo story were a demonstration of ToM—reacting to her peer's expressions and to her own emotions.

**Implications of the digital photo story and ToM.** Individuals with ASD exhibit difficulties of understanding language as a means for interacting with others, for understanding how communication relates to expression and interpretation of intended meaning, and in understanding the listener's perspective (Hale & Tager-Flusberg, 2005). This lack of understanding, or ToM deficit, affects the ability of many individuals with ASD to engage in conversations in a sustained or meaningful way. Hale and Tager-Flusberg (2005) reported research conducted by Dunn and Cutting (1999, as cited in Hale & Tager-Flusberg, 2005) that indicated individuals engaging in reciprocal conversations contributed significantly to the development of ToM.

The digital photo-story production process utilizes the EBPs of joint attention, language training, modeling, and scripting—strategies designed specifically to increase opportunities for reciprocal conversations and structured discourse. Utilizing the digital photo-story production process specifically incorporating the discussed EBPs may target and strengthen ToM deficits for the child with ASD.

**WCC.** Central coherence is the ability of the mind to draw together detailed information to formulate the “big picture” (Frith, 1989). WCC is “a failure to integrate local details into a global entity” (Burnette et al., 2005, p. 64). The WCC theory suggests children with ASD struggle with communication, social interaction, and behavioral flexibility due to the lack of a strong central coherence (Burnette et al., 2005; Frith,

1989). Children with ASD focus on small parts or the present steps of an activity without considering what the completed project will become or provide. All five teachers noted the digital photo-story process involved completing the story slide by slide (small steps), but the end result (watching the photo-story movie) allowed the student to see the completed project immediately. The digital photo-story strategy was able to help the student see the big picture. In the postproject interview question #10, the researcher and Case #2 had this conversation addressing WCC and the photo-story process:

Researcher: You know . . . students with autism have executive functioning issues and a weak central coherence. They don't organize well; they see the little pieces of the puzzle, not the big picture. And, they don't see past what's going on right now. So in your thoughts . . . do you think the digital photo story is a tool that helps . . . reign in some of that on a child with autism?

Case #2: Yeah, . . . when they see that they're in a movie and the end result, that's so big picture for them regardless of how they felt about the other stuff . . . I think that end result solidifies a lot of that for them and the more that you can do with all the different kinds of topics they're going to put a lot of pieces of that executive functioning puzzle together. So, I really do like it. I use it all the time.

**Implications of the digital photo story and WCC.** Happe' and Frith (2006) noted in concluding statements in their study of WCC and its impact on individuals with ASD,

Among the remaining challenges is the need to establish relationships between weak coherence, or alternative accounts of detail-focused processing bias, and real-life abilities and difficulties. Finally, the notion of weak coherence has yet to be translated into educational approaches, which may, perhaps, prove the ultimate

test of this theory's veracity and value. (p. 17)

Happe' and Frith acknowledged the difficulties of providing educational strategies to address WCC deficits due to the nature of the cognitive interferences brought on by WCC. However, Happe' and Frith issued a challenge for future researchers to seek educational strategies and interventions that would address WCC deficits. Individuals with ASD are characterized by exhibiting WCC which manifests in the inability to understand intentions of conversations and various social cues, behaviors which may be appropriate or inappropriate at specified times (Burnette et al., 2005).

The digital photo-story production process may be used to break down whole conversations into meaningful chunks paired with photos of socially appropriate actions and responses. This visual representation of conversation may allow structured instruction to address the WCC deficits. Further research examining the digital photo-story strategy utilized to address WCC deficits for individuals with ASD may provide answers for Happe' and Frith's (2006) challenge. The digital photo-story production process may be a strategy well designed to strengthen WCC in individuals with ASD.

**Weak executive function.** EF is an individual's ability to perform skills such as organizing, planning, sustaining attention, and inhibiting inappropriate responses (Frith & Happe', 1994). Individuals with ASD exhibit a weak EF in the ability to use skills like planning, sequencing, and self-regulation (Autism Speaks, 2010; Frith, 2008). In the postproject interviews, all five teachers indicated the digital photo-story process provided a structured step-by-step format explicitly utilizing planning skills, sequencing activities, and sustained attention to task. They also indicated the process provided an organized lesson format that regulated the child's responses. Case #2, who often made photo stories with her students, provided the following answer to the researcher's question, "Did you

see different strengths or abilities emerge from your student during the photo-story process”:

You know, he’s one of those kids who will say, “I can’t read. I don’t want to read. I don’t know what letter B is.” He’ll give you every excuse in the book. But when it comes to this . . . it’s exactly the same skill, but he’s more than willing to do it now. And I didn’t know when I started doing this with him that he would be able to produce his own work. It was very highly guided and very repetitive and now we can come—he can come up with a story on his own—beginning, middle and end kind of thing. So, he’s really seen a lot of growth. I’ve been very impressed. Yeah! (Postproject Interview Question #9)

**Implications of the digital photo story and weak EF.** EBPs and strategies utilized to address weak EF include making checklists of steps involved in an activity, providing visual reminders of steps, creating planning calendars and schedules, setting time limits for an activity, providing clear and concise explanations of expectations, allowing the child to repeat and acknowledge understanding of the explanations provided, and involving the child in planning stages of expected completed projects (Autism Speaks, 2010; Frith, 2008; Morin, 2015). The digital photo-story production process utilizes a sequenced and structured process to create and complete a project. The digital photo-story process incorporates detailed planning of the project, utilizing visual cues, and providing clear directives and opportunities for the child to reciprocate and acknowledge understanding of the expectations. Teacher perceptions of the digital photo-story production experience relative to addressing weak EF in the student with ASD suggest the strategy may be used to provide structured formats to increase EF output.

These findings imply the digital photo-story strategy, when used with students with ASD, may address communication and social skill deficits and weaknesses in ToM, WCC, and EF. Overall, utilizing the digital photo-story tool as an instructional strategy on a regular basis may help students increase awareness with intrapersonal and interpersonal levels of communication skills, social skills, and emotions. This tool has the potential to increase the student's ability to plan and organize an activity by allowing them to forecast what a completed project may look like, thus aiding him or her in seeing the bigger picture. This comprehensive viewpoint is a weakness in many children with ASD.

### **Theoretical Framework of Gardner's Multiple Intelligences**

Gardner (1983) noted that understanding multiple kinds of intelligences could reinforce varied instructional strategies. Armstrong (2013), discussing Gardner's theory of multiple intelligences, stated,

The theory of multiple intelligences proposes a major transformation in the way our schools are run. It suggests that teachers be trained to present their lessons in a wide variety of ways using music, cooperative learning, art activities, role play, multimedia, field trips, inner reflection, and much more. (para. 2)

Armstrong noted that an instructor does "not have to teach or learn something in all eight ways, just see what the possibilities are, and then decide which particular pathways interest [the instructor] the most, or seem to be the most effective teaching or learning tools" (para 6).

All five teachers in the study noted that multiple kinds of intelligences were addressed when utilizing the digital photo-story tool. The participants provided examples of the digital photo-story strategy addressing eight of Gardner's (1993) nine intelligences:

Verbal-Linguistic Intelligence, Mathematical-Logical Intelligence, Musical Intelligence, Visual-Spatial Intelligence, Bodily-Kinesthetic Intelligence, Interpersonal Intelligence, Intrapersonal Intelligence, and Naturalist Intelligence. Case #2 noted her student's use of critical thinking skills and visual, musical, and linguistic intelligences. Case #2 stated,

Sure, well I think you know, because of the length of the process and all the different pieces that are involved, the kids are getting to experience the content, whatever it may be, in multiple ways. So, you know, there's critical thinking involved when you're coming up with the story and then when you have to take the pictures of the various visual—especially if the kids are having other kids in their shots and things like that. Or for adding anything else to the pictures, you know, there's music involved at times, and then the pacing of everything so that the timing . . . and all that. And then, you know, there's the writing component.

(Postproject Interview Question #3)

Case #2 noted sensory and interpersonal intelligences were addressed by the photo-story process:

You know, [the student] has a lot of sensory issues, so—and his joint attention skills are really bad. So . . . for him to have come to a place now where he will sit on task for so long, I honestly had no idea that he would work for that length of time at something that he honestly doesn't like in other formats. (Postproject

Interview Question #9)

Case #3 utilized verbal-linguistic, visual-spatial, mathematical-logical (i.e., the logical steps), and naturalistic intelligences during the set-up of the digital photo story with her student. Case #3 stated,

I started by trying to access student interest and picked a topic I felt like the

student I was working with was interested in [the topic was about deer]. I let him give me feedback and then we did some reading, background reading on that topic and we together talked about some ideas that we might want to put in the photo story for sentences. Like, we found facts we thought would be good and I kind of jotted them down. Then we looked at pictures that kind of corresponded to each one of the facts, and the student helped me choose photos that he wanted to include in his photo story. (Postproject Interview Question #2)

Case #5 provided examples of how the digital photo story incorporated verbal-linguistic, visual-spatial, interpersonal, and intrapersonal intelligences:

Advantages of using the photo story is that it definitely incorporates the visual components and auditory components of hearing their voices as well as kind of a tactile thing if they do it themselves as far as recording and even taking pictures or something like that. It's very interactive. And I think it connects with them on another level too, like on a social level because it is something that they're enjoying because they love computers and things like that. (Postproject Interview Question #8)

The digital photo story may encompass and address multiple intelligences in a single photo-story lesson. These findings suggest the digital photo story is a strategy that may be used to successfully address multiple kinds of intelligences and would allow multiple ways to teach, rather than one way, adding credence to the photo-story tool's alignment with Gardner's (1993) theory of multiple intelligences as the theoretical framework for this research.

### **Implications of the Research**

As stated in Chapter 1 of this study, the increase of children diagnosed with ASD

is the fastest growing developmental disability in the U.S. The Epidemic of Autism (2012) noted that in the 1970s, the global rate for children diagnosed with ASD was one in 25,000; in the 80s, one in 2,500; in the 90s, one in 250; and in the 2000s, one in 68. Educators, caretakers, and society at large must address how to meet the needs of the increasing population of individuals diagnosed with ASD. Effective instructional practices to help children with ASD participate and function in society must continue to be developed and perfected. Chapter 5 presented findings as a result of the study of the digital photo story and noted its effectiveness on these particular students to address known weaknesses for individuals with ASD such as communication skills, social skills, ToM concerns, WCC, and weak EF. The digital photo-story strategy supported student strengths in communication, social skills, and EF. Furthermore, the digital photo-story strategy afforded the teacher and student the opportunity to use multiple intelligences to create the photo-story product.

The impact of this study is multi-faceted. This study has the potential to contribute to practice and policy in the education profession by adding information to scholarly research concerning EBPs utilized with students with ASD. In addition, this study may serve as a resource for teachers, paraprofessionals, parents, administrators, and any individual who is seeking knowledge of how to teach and/or work with children with ASD. It is necessary to continue research on effective strategies and treatments for individuals with ASD in order to help them lead successful and productive lives.

It is recommended that educators, paraprofessionals, parents, or administrators who are seeking ways to more effectively teach and/or work with children with ASD review this study and note the perceived positive impact the digital photo story had on the communication and social skills of students with ASD. It is recommended that educators

and parents promote professional development to further discuss and train general and special education teachers and paraprofessionals on how to implement effective instructional strategies (including the digital photo story) for children with ASD.

### **Recommendations for Future Research**

This study serves as a starting point for understanding the digital photo story as an effective instructional strategy to address areas of communication and social skills for individuals with ASD. The researcher recommends additional studies be conducted to continue research on the efficacy of the digital photo story to address its shared traits with EBPs, utilization of multiple intelligences, and its interaction with ToM, WCC, and weak EF exhibited by individuals with ASD. Future research might focus on comparing digital photo-story tools to determine strengths and weaknesses of various production products on the communication and social skills of students with ASD. Future studies examining professional development and training related to introducing effective strategies for educators and paraprofessionals working with students with ASD are recommended.

The sample of participants in this study was limited to five teachers. A more comprehensive sample size for additional research would be conducive to expanding the knowledge-base of the effectiveness of the digital photo story as an instructional strategy for individuals with ASD. A longitudinal study following teachers and students over a longer period of time allowing for increased participant LoU might provide noteworthy results as well.

## References

- Ahern, K. J. (1999). Pearls, pith, and provocation: Ten tips for reflexive bracketing. *Qualitative Health Research*, 9(3), 407-411. doi:10.1177/104973239900900309
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: APA.
- American Speech-Language Hearing Association. (2015). Autism (Autism spectrum disorder). Retrieved from <http://www.asha.org/public/speech/disorders/Autism/>
- Anderson, S. (1997). Understanding teacher change: Revisiting the Concerns Based Adoption Model. *Curriculum Inquiry*, 27(3), 331-336.
- Applied Behavior Analysis. (2014). Autism Speaks. Retrieved from <http://www.autismspeaks.org/what-autism/treatment/applied-behavior-analysis-aba>
- Armstrong, T. K. (2009). A computer assisted repeated reading intervention with children with high functioning autism (Thesis). Retrieved from ProQuest Dissertations and Theses. (UMI No. 3394208)
- Armstrong, T. (2013). Multiple intelligences. Retrieved from [http://www.institute4learning.com/multiple\\_intelligences.php](http://www.institute4learning.com/multiple_intelligences.php)
- Asperger, H. (1944). "Autistic psychopathy" in childhood (U. Frith, Trans. & annotated). In U. Frith. (Ed.), *Autism and Asperger syndrome* (pp. 37-92). New York: Cambridge University Press. 1991.
- Autism and Developmental Disabilities Monitoring Network. (2014). Community report on autism 2014. (2014). Retrieved from [http://www.cdc.gov/ncbddd/autism/states/comm\\_report\\_autism\\_2014.pdf](http://www.cdc.gov/ncbddd/autism/states/comm_report_autism_2014.pdf)
- Autism Fact Sheet. (2015). National Autism Association. Retrieved from <http://nationalautismassociation.org/resources/autism-fact-sheet/>
- Autism Research Institute. (2014). The expanding mission of ARI. Retrieved from [http://www.autism.com/expanding\\_2014](http://www.autism.com/expanding_2014)
- Autism Society. (2015). Causes. Retrieved from <http://www.autism-society.org/about-autism/causes/>
- Autism Speaks. (2010). Executive functioning and theory of mind. Autism Speaks. Retrieved from [https://www.autismspeaks.org/sites/default/files/documents/as-hfa/ef\\_tm\\_as-hfa\\_tool\\_kit.pdf](https://www.autismspeaks.org/sites/default/files/documents/as-hfa/ef_tm_as-hfa_tool_kit.pdf)

- Autism Speaks. (2014). Facts about autism. Autism Speaks. Retrieved from <http://www.autismspeaks.org/what-autism/facts-about-autism>
- Autism Speaks. (2015). DSM-5 diagnostic criteria. Retrieved from <https://www.autismspeaks.org/what-autism/diagnosis/dsm-5-diagnostic-criteria>
- Baxter, P., & Jack, S. (2008). Qualitative case study methodology: Study design and implementation for novice researchers. *The Qualitative Report*, 13(4), 544-559  
Retrieved from <http://www.nova.edu/ssss/QR/QR13-4/baxter.pdf>
- Baron-Cohen, S. (1995). *Mind blindness: An essay on autism and theory of mind*. Boston, MA: MIT Press/Bradford Books.
- Baron-Cohen, S., Leslie, A. M., & Frith, U. (1985). Does the autistic child have a "theory of mind?" *Cognition*, 21, 37–46. Retrieved from [http://autismtruths.org/pdf/3.%20Does%20the%20autistic%20child%20have%20a%20theory%20of%20mind\\_SBC.pdf](http://autismtruths.org/pdf/3.%20Does%20the%20autistic%20child%20have%20a%20theory%20of%20mind_SBC.pdf)
- Boesch, M., Wendt, O., Subramanian, A., & Hsu, N. (2013). Comparative efficacy of the Picture Exchange Communication System (PECS) versus a speech-generating device: Effects on requesting, *Research in Autism Spectrum Disorders*, 7, 480-493.
- Bondy, A. (2001). PECS: Potential benefits and risks. *The Behavior Analyst Today*, 2, 127-132.
- Briggs, H. (2014). Autism "begins long before birth" BBC News. March, 26, 2014. Retrieved July 2014 from <http://www.bbc.com/news/health-26750786>
- Brock, J. (2014). The evolution of "autism": Comparing DSM-III and DSM-5. Retrieved from <http://crackingtheenigma.blogspot.com/2014/01/the-evolution-of-autism-comparing-dsm.html>
- Burnette, C. P., Mundy, P. C., Meyer, J. A., Sutton, S. K., Vaughan, A. E., & Charak, D. (2005). Weak central coherence and its relations to theory of mind and anxiety in autism. *Journal of Autism and Developmental Disorders*, 35(1), 63-73. Retrieved from [http://www.researchgate.net/profile/Peter\\_Mundy/publication/7940095\\_Weak\\_central\\_coherence\\_and\\_its\\_relations\\_to\\_theory\\_of\\_mind\\_and\\_anxiety\\_in\\_autism/links/02bfe50e49866e691f000000.pdf](http://www.researchgate.net/profile/Peter_Mundy/publication/7940095_Weak_central_coherence_and_its_relations_to_theory_of_mind_and_anxiety_in_autism/links/02bfe50e49866e691f000000.pdf)
- Butin, D. W. (2010). *The education dissertation: A guide for practitioner scholars*. Thousand Oaks, CA: Corwin.
- Centers for Disease Control's Autism and Developmental Disabilities Monitoring Network. (n.d.) [Fact Sheet for <http://www.cdc.gov/>]. Retrieved from [http://www.cdc.gov/ncbddd/autism/states/addm-fact-sheet\\_508.pdf](http://www.cdc.gov/ncbddd/autism/states/addm-fact-sheet_508.pdf)

- CERTEC-A Division of Lund University. (2005). *The history of autism*. Retrieved July 15, 2014, from [http://www.english.certec.lth.se/autism/kunskap\\_e.html](http://www.english.certec.lth.se/autism/kunskap_e.html)
- Chapman, A. (2015). Howard Gardner's multiple intelligences. Retrieved from <http://www.businessballs.com/howardgardnermultipleintelligences.htm>
- Colby, K. M. (1967). Computer-aided language development in nonspeaking mentally disturbed children. *Archives of General Psychiatry*, 19, 641–651. Retrieved from <http://i.stanford.edu/pub/cstr/reports/cs/tr/68/85/CS-TR-68-85.pdf>
- Colby, K. M. (1968). Computer-aided language development in nonspeaking children. *Archives of General Psychiatry*, 19(6), 641-651. doi:10.1001/archpsyc.1968.01740120001001
- Colby, K. M. (1973). The rationale for computer-based treatment of language difficulties in nonspeaking autistic children. *Journal of Autism and Childhood Schizophrenia*, 3, 254-260. Retrieved from <http://i.stanford.edu/pub/cstr/reports/cs/tr/73/346/CS-TR-73-346.pdf>
- Constable, S., Grossi, B., Moniz, A., & Ryan, L. (2013). Meeting the common core state standards for students with autism: The Challenge for Educators. *Teaching Exceptional Children*, 45(3), 6-13. Retrieved from <http://www.cdd.unm.edu/autism/handouts/Article%20Constable%20et%20al.%202013.pdf>
- Creswell, J. W. (2014). *Research Design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Thousand Oaks, CA: Sage Publications.
- Department of Health and Human Services, Centers for Disease Control and Prevention. (2014). Prevalence of Autism Spectrum Disorders — Autism and Developmental Disabilities Monitoring Network, 11 Sites, United States, 2010." *Morbidity and Mortality Weekly Report*. 28 March, 2014. Retrieved from <http://www.cdc.gov/mmwr/pdf/ss/ss6302.pdf>
- Department of Public Instruction of North Carolina. (2015). Common core state and NC essential standards. Retrieved from <http://www.dpi.state.nc.us/acre/standards/>
- Digital Storytelling. (n.d.). In *Wikipedia*. Retrieved April 19, 2015, from [http://en.wikipedia.org/wiki/Digital\\_storytelling](http://en.wikipedia.org/wiki/Digital_storytelling)
- Doheny, K. (n.d.). Autism cases on the rise; Reason for increase a mystery. WebMD. Retrieved April 8, 2015, from <http://www.webmd.com/brain/autism/searching-for-answers/autism-rise>
- Dunn, J., & Cutting, A. (1999). Understanding others, and individual differences in friendship interactions in young children. *Social Development*, 8, 201-219.

- Edelson, S. (2015). Structured teaching--The TEACCH method. Retrieved from [http://www.autism.com/treating\\_TEACCH](http://www.autism.com/treating_TEACCH)
- Educational Testing Service. (2015). Praxis®. Retrieved from <https://www.ets.org/praxis/about/>
- The Epidemic of Autism. (2012). Autismtoday.com. Retrieved from <http://www.autismtoday.com/library-back/The%20epidemic%20of%20autism.html>
- Fischbach, G. D. (2007). *Leo Kanner's 1943 paper on autism*. Simons Foundation Autism Research Initiative. Retrieved from <http://sfari.org/news-and-opinion/classic-paper-reviews/2007/leo-kanners-1943-paper-on-autism-commentary-by-gerald-fischbach>
- Fletcher-Watson, S. (2014). A targeted review of computer-assisted learning for people with autism spectrum disorder: Towards a consistent methodology. *Revised Journal of Autism and Developmental Disorders*, 1, 87-100. doi:10.1007/s40489-013-0003-4
- Frels, R. K., & Onwuegbuzie, A. J. (2012). Interviewing the interpretive researcher: An impressionist tale. *The Qualitative Report* 2012, 70, Article 60, 1-27. Retrieved from <http://www.nova.edu/ssss/QR/QR17/frels.pdf>
- Frith, U. (1989). *Autism: Explaining the enigma*. Oxford: Blackwell Publishers.
- Frith, U. (2008). *How cognitive theories can help us explain autism*. Presentation to the UC Davis Mind Institute. Retrieved from <http://www.thesmartfoundation.org/causes-of-autism/how-cognitive-theories-can-help-us-explain-autism/>
- Frith, U., & Happe', F. (1994). Autism: Beyond "theory of mind." *Cognition*, 50, 115-132.
- Fullan, M. (2001). *Leading in a culture of change*. San Francisco, CA: Jossey-Bass.
- Gallicano, T. D. (2013). An example of how to perform open coding, axial coding and selective coding. Retrieved from <https://prpost.wordpress.com/2013/07/22/an-example-of-how-to-perform-open-coding-axial-coding-and-selective-coding/>
- Gardner, H. (1983). *Frames of mind: The theory of multiple intelligences*. New York, NY: Basic Books.
- Gardner, H. (1993). *Frames of mind: The theory of multiple intelligences*, Britain, United Kingdom: Fontana Press.
- Gardner, H. (1999). *The disciplined mind: Beyond facts and standardized tests, the K-12 education that every child deserves*. New York: Simon and Schuster.

- Goldsmith, T. R., & LeBlanc, L. A. (2004). Use of technology in interventions for children with autism. *Journal of Early and Intensive Behavior Intervention, 1*(2), 166-178. Retrieved from <http://files.eric.ed.gov/fulltext/EJ848688.pdf>
- Haelle, T. (2015). Majority of autism increase due to diagnostic changes, finds new study. Retrieved from <http://www.forbes.com/sites/tarahaelle/2015/01/05/majority-of-autism-increase-due-to-diagnostic-changes-finds-new-study/>
- Hale, C. M., & Tager-Flusberg, H. (2005). Social communication in children with autism: The relationship between theory of mind and discourse development. Retrieved from [http://www.bu.edu/autism/files/2010/03/PDF\\_1.pdf](http://www.bu.edu/autism/files/2010/03/PDF_1.pdf)
- Hall, G. E., & Hord, S. M. (1987). *Change in schools: Facilitating the process*. New York, NY: State University of New York Press.
- Hall, G. E., & Hord, S. M. (2015). *Implementing change: Patterns, principles, and potholes* (4th ed.). Boston, MA: Pearson.
- Hall, G., Wallace, R. E., & Dossett, W. (1973). *A developmental conceptualization of the adoption process within educational institutions*. Austin, TX: Research and Development Center for Teacher Education, The University of Texas at Austin.
- Hansen, S. N., Schendel, D. E., & Parner, E. T. (2015). Explaining the increase in the prevalence of autism spectrum disorders: The proportion attributable to changes in reporting practices. *Journal of the American Medical Association, 168*(1), 56-62. doi:10.1001
- Happé, F., & Frith, U. (2006). The weak coherence account: Detail-focused cognitivistyle in autism spectrum disorders. *Journal of Autism and Developmental Disorders*. doi:10.1007/s10803-005-0039-0
- Heimann, M., Nelson, K. E., Tjus, T., & Gillberg, C. (1995). Increasing reading and communication skills in children with autism through an interactive multimedia computer program. *Journal of Autism and Developmental Disorders, 25*(5), 459-480.
- Hetzroni, O. E., & Tannous, J. (2004). Effects of a computer-based intervention program on the communicative functions of children with autism. *Journal of Autism and Developmental Disorders, 34*(2), 95-113. Retrieved from [http://www.aspires-relationships.com/Effects\\_of\\_a\\_Computer\\_Based\\_Intervention\\_Program\\_on\\_the.pdf](http://www.aspires-relationships.com/Effects_of_a_Computer_Based_Intervention_Program_on_the.pdf)
- Hill, E. L. (2004). Executive dysfunction in autism. *Trends in Cognitive Sciences, 8*(1), 26-32. Retrieved from <http://www.ucd.ie/artsps/langimp/autismexecdysf.pdf>

- Hodgson, K. (2012, August). Digital storytelling and the common core: A presentation connecting digital writing with standards-based curriculum by Kevin Hodgson. Retrieved from <https://prezi.com/ip6t96y4v2lo/digital-storytelling-and-the-common-core/>
- Hollingshead, B. (2009). The concerns-based adoption model: A framework for examining implementation of a character education program. *NASSP Bulletin*, 93(3), 166-183. doi:10.1177/0192636509357932
- Individuals with Disabilities Education Act Amendments of 1997. (1997). Retrieved from <https://www2.ed.gov/policy/speced/leg/idea/idea.pdf>
- Individuals with Disabilities Education Improvement Act, 20 U.S.C. (2004). Retrieved from [http://www.parentcenterhub.org/wp-content/uploads/repo\\_items/PL108-446.pdf](http://www.parentcenterhub.org/wp-content/uploads/repo_items/PL108-446.pdf)
- Individuals with Disabilities Education Improvement Act, 20 U.S.C. §§1412(a) (1) and 1414(d) (2004a). Retrieved from [http://www.parentcenterhub.org/wp-content/uploads/repo\\_items/PL108-446.pdf](http://www.parentcenterhub.org/wp-content/uploads/repo_items/PL108-446.pdf)
- Individuals with Disabilities Education Improvement Act, 20 U.S.C. §§1412(a)(16)(A) (2004b). Retrieved from [http://www.parentcenterhub.org/wp-content/uploads/repo\\_items/PL108-446.pdf](http://www.parentcenterhub.org/wp-content/uploads/repo_items/PL108-446.pdf)
- Institute on Disability. (2014). Annual disability statistics compendium. Retrieved from <http://disabilitycompendium.org/compendium-statistics/special-education>
- Johnson, B., & Christensen, L. (2012). *Educational research: Quantitative, qualitative, and mixed approaches* (4th ed.). Boston, MA: Pearson.
- Jones, E. A., Feeley, K. M., & Takacs, J. (2007). Teaching spontaneous responses to young children with autism. *Journal of Applied Behavior Analysis*, 40(3), 565-570. doi: 10.1901/jaba.2007.40-565
- Kanner, L. (1943). Pathology: Autistic disturbances of affective contact. *Nervous Child*, 2, 217-250. Retrieved from [http://neurodiversity.com/library\\_kanner\\_1943.pdf](http://neurodiversity.com/library_kanner_1943.pdf)
- Karim, F. P. (2009). *The effectiveness of instructional strategies used for children with autism* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses. (UMI No. 3355018)
- Kuhn, R. (2004). (Tran. CH Cahn). Eugen Bleuler's concepts of psychopathology. *History of Psychiatry*, 15(3), 361-366. doi:10.1177/0957154X04044603. PMID 15386868
- Kuypers, L. (2015). The zones of regulation: A framework to foster self-regulation and emotional control. Retrieved from <http://www.zonesofregulation.com/>

- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Newbury Park, CA: Sage Publications.
- Luckevich, D. (2008). *Computer assisted instruction for teaching vocabulary to a child with autism*. (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses. (UMI No. 3304124)
- Luke, S. D., & Schwartz, A. (2007). Assessment and accommodations. *Evidence for Education, 11*(1), 1-11.
- Mahomed, R. (2005). Training comprehension of object names by behavioral intervention for children with autism using clinician or computer instruction (Doctoral dissertation). Retrieved from HKU Scholars Hub <http://hub.hku.hk/bitstream/10722/48752/1/ft.pdf?accept=1>
- Marder, T., & Fraser, D. (2012). Evidence-based practice for special educators teaching students with autism. *Special Education Journal, 7*(7). Retrieved from <http://education.jhu.edu/PD/newhorizons/Journals/specialedjournal/MarderandFraser>
- Massaro, D. W., & Bosseler, A. (2006). Read my lips: The importance of the face in a computer-animated tutor for vocabulary learning by children with autism. *Autism, 10*(5), 495-510. Retrieved from <https://mambo.ucsc.edu/wp-content/uploads/sites/158/2015/02/ReadMyLips.pdf>
- Massaro, D. W., Bosseler, A., & Light, J. (2003). Development and evaluation of a computer-animated tutor for vocabulary and language learning in children with autism. *Journal of Autism and Developmental Disorders, 33*(6), 653-672. Retrieved from [http://pdf.aminer.org/000/334/117/a\\_computer\\_animated\\_tutor\\_for\\_spoken\\_and\\_written\\_language\\_learning.pdf](http://pdf.aminer.org/000/334/117/a_computer_animated_tutor_for_spoken_and_written_language_learning.pdf)
- Mazumdar, S., Winter, A., Liu, K. Y., & Bearman, P. (2013). Spatial clusters of autism births and diagnoses point to contextual drivers of increased prevalence. *Social Science & Medicine, 95*, 87-96. doi:10.1016
- Microsoft Photostory 3 (n.d.). Retrieved from [http://www.class.uh.edu/classidt/Tutorials\\_Help/profs/software/PhotoStory3\\_FullTutorial.pdf](http://www.class.uh.edu/classidt/Tutorials_Help/profs/software/PhotoStory3_FullTutorial.pdf)
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis* (2nd ed.). Thousand Oaks, CA: Sage Publications.
- Moore, M., & Calvert, S. (2000). Brief report: Vocabulary acquisition for children with autism: Teacher or computer instruction. *Journal of Autism and Developmental Disorders, 30*(4), 359-362.

- More, C. (2008). Digital stories targeting social skills for children with disabilities: Multidimensional learning. *Intervention in School and Clinic*, 43(3), 168-177. Retrieved from <http://456simmons.wikispaces.com/file/view/Digital+Stories+Targeting+Social+Skills+for+Children+with+Disabilities.pdf>
- Morin, A. (2015). Understanding executive functioning issues. Retrieved from <https://www.understood.org/en/learning-attention-issues/child-learning-disabilities/executive-functioning-issues/understanding-executive-functioning-issues#item7>
- Morrow, S. L. (2005). Quality and trustworthiness in qualitative research in counseling psychology. *Journal of Counseling Psychology*, 52(2), 250-260. doi:10.1037/0022-0167.52.2.250
- Mozes, A. (2013). Smart technology may help kids with Autism learn, communicate. U.S. News and World Report. Retrieved from <http://health.usnews.com/health-news/news/articles/2013/08/02/smart-technology-may-help-kids-with-autism-learn-communicate>
- National Autism Center. (2009). National standards project: Report. (2009). Randolph, MA: National Autism Center. Retrieved from <http://www.nationalautismcenter.org/download/4596/>
- National Autism Center. (2015). Findings and conclusions: National standards project phase 2. Randolph, MA: National Autism Center. Retrieved April 17, 2015, from <http://www.nationalautismcenter.org/download/4773/>
- The National Autistic Society. (2015). Communication and interaction. Retrieved from <http://www.autism.org.uk/living-with-autism/communicating-and-interacting/communication-and-interaction.aspx>
- National Public Radio. (2015a). The legacy of autism. September 2, 2015. Retrieved from <http://freshairnpr.npr.libsynfusion.com/the-legacy-of-autism> National Public Radio
- National Public Radio. (2015b). Shots: Health news from NPR “NeuroTribes” examines the history—and myths—of the autism spectrum. Retrieved September 12, 2015 from <http://www.npr.org/sections/health-shots/2015/09/02/436742377/neurotribes-examines-the-history-and-myths-of-the-autism-spectrum>
- National Research Council. (2001). *Educating children with autism*. Washington, DC: National Academy Press.

- No Child Left Behind. (2004, March). Fact sheet new no child left behind flexibility: Highly Qualified Teachers March 2004. Retrieved from <http://www2.ed.gov/nclb/methods/teachers/hqtflexibility.pdf>
- No Child Left Behind Act of 2001, 20 U.S.C. 70 § 6301 *et seq.* (2002). Retrieved from <http://www2.ed.gov/policy/elsec/leg/esea02/107-110.pdf>
- Northern Illinois University. (2009). Howard Gardner's theory of multiple intelligences Retrieved January 28, 2015, from [https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&cad=rja&uact=8&ved=0CC4QFjACahUKEwjpi9STqe3GAhWKFj4KHTpECI8&url=http%3A%2F%2Fwww.niu.edu%2Ffacdev%2Fresources%2Fguide%2Flearning%2Fhoward\\_gardner\\_theory\\_multiple\\_intelligences.pdf&ei=Pc6uVan5Coqt-AG6iKn4BQ&usg=AFQjCNGxlBcJgeejwKKeh5WaBTr22StDxg&bvm=bv.98197061,d.cWw](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&cad=rja&uact=8&ved=0CC4QFjACahUKEwjpi9STqe3GAhWKFj4KHTpECI8&url=http%3A%2F%2Fwww.niu.edu%2Ffacdev%2Fresources%2Fguide%2Flearning%2Fhoward_gardner_theory_multiple_intelligences.pdf&ei=Pc6uVan5Coqt-AG6iKn4BQ&usg=AFQjCNGxlBcJgeejwKKeh5WaBTr22StDxg&bvm=bv.98197061,d.cWw)
- Odom, S. L. (2013). Technology-aided instruction and intervention (TAII) fact sheet. Chapel Hill: The University of North Carolina, Frank Porter Graham Child Development Institute, The National Professional Development Center on Autism Spectrum Disorders. Retrieved from [http://autismpdc.fpg.unc.edu/sites/autismpdc.fpg.unc.edu/files/Technology\\_Aided\\_Instruction\\_factsheet.pdf](http://autismpdc.fpg.unc.edu/sites/autismpdc.fpg.unc.edu/files/Technology_Aided_Instruction_factsheet.pdf)
- Odom, S. L., Collet-Klingenberg, L., Rogers, S. J., & Hatton, D. D. (2010). Evidence-based practices in interventions for children and youth with autism spectrum disorders. *Preventing School Failure*, 54(4), 275-282. doi:10.1080/10459881003785506 Retrieved from [https://www.gvsu.edu/cms3/assets/2CF6CA25-D6C6-F19E-339DC5CD2EB1B543/training/earlychildhood12-13/1-ecorientationfoundations/2\\_-\\_odom\\_ebp\\_article\\_2010.pdf](https://www.gvsu.edu/cms3/assets/2CF6CA25-D6C6-F19E-339DC5CD2EB1B543/training/earlychildhood12-13/1-ecorientationfoundations/2_-_odom_ebp_article_2010.pdf)
- Ohler, J. B. (2013). *Digital storytelling in the classroom: New media pathways to literacy learning* (2nd ed.). Thousand Oaks, CA: Corwin, A Sage Publication.
- Ortlipp, M. (2008). Keeping and using reflective journals in the qualitative research process. *The Qualitative Report*, 13(4), 695-705. Retrieved from <http://www.nova.edu/ssss/QR/QR13-4/ortlipp.pdf>
- Palermo, J. (n.d.). Doing qualitative research an introduction to field work: Conducting observations, taking field notes, and interviewing [Power point]. Gardner-Webb University.
- Pellicano, E. (2010). Individual differences in executive function and central coherence predict developmental changes in theory of mind in autism. *Developmental Psychology*, 46(2), 530-544.

- Pellicano, E. (2012). The development of executive function in autism. *Autism Research and Treatment 2012*. doi:10.1155/2012/146132 Retrieved from <http://downloads.hindawi.com/journals/aurt/2012/146132.pdf>
- Pelphrey, K. A., Sasson, N. J., Reznick, J. S., Paul, G., Goldman, B. D., & Piven J. (2002). Visual scanning of faces in autism. *Journal of Autism and Developmental Disorders*, 32(4), 249-261.
- Pennington, R. C. (2010). Computer-assisted instruction for teaching academic skills to students with autism spectrum. *Focus on Autism and Other Developmental Disabilities*, 25, 239-248. doi:10.1177/1088357610378291
- Pennington, R. C., Ault, M. J., Schuster, J. W., & Sanders, A. (2010). Using simultaneous prompting and computer-assisted instruction to teach story writing to students with autism. *Assistive Technology Outcomes and Benefits*, 7(1), 24-38.
- Pennington, R. C., & Delano, M. E. (2012). Writing instruction for students with autism spectrum disorders: A review of literature. *Focus on Autism and Other Developmental Disabilities*, 27(3), 158-167.
- Ploog, B. O., Scharf, A., Nelson, D., & Brooks, P. J. (2012). Use of computer-assisted technologies (CAT) to enhance social, communicative, and language development in children with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 43, 301-322. doi:10.1007/s10803-012-1571-3
- Pollak, R. (1997). *The creation of Dr. B: A biography of Bruno Bettelheim*. New York, NY: Simon & Schuster.
- Porter, B. (2004). *DigiTales: The art of telling digital stories*. Sedalia, CO: Bernajean Porter Consulting.
- Premack, D., & Woodruff, G. (1978). Does the chimpanzee have a "theory of mind"? *Behavioral and Brain Sciences*, 1(4), 515-526. doi:10.1017/S0140525X00076512
- Public Law 94-142, Education for All Handicapped Children Act of 1975, 1975. Retrieved from <http://www.gpo.gov/fdsys/pkg/STATUTE-89/pdf/STATUTE-89-Pg773.pdf>
- Pyramid Educational Consultants. (2014). Pyramid educational consultants: PECS. Retrieved from <http://www.pecsusa.com/>
- Reagon, K. A., Higbee, T. S., & Endicott, K. (2007). Using video instruction procedures with and without embedded text to teach object labeling to preschoolers with autism: A preliminary investigation. *Journal of Special Education Technology*, 22(1), 12-20.

- Refrigerator Mothers. (2002). [Video Documentary and Article]. Public Broadcasting System. Retrieved from <http://www.pbs.org/pov/refrigeratormothers/fridge.php>
- Rennie, D. L. (2004). Reflexivity and person-centered counseling. *Journal of Humanistic Psychology, 44*(2), 182-203. doi:10.1177/0022167804263066
- Reynolds, G. (2012). Presentation zen: How to craft a presentation with messages that stick. Pearson: Peachpit. Retrieved from <http://www.peachpit.com/articles/article.aspx?p=1828677&seqNum=2>
- Rimland, B. (1964). *Infantile autism: The Syndrome and its implications for a neural theory of behavior*. New York, NY: Appleton-Century-Crofts.
- Robinson, S., Goddard, L., Dritschel, B., Wisley, M., & Howlin, P. (2009). Executive functions in children with Autism Spectrum Disorders. *Brain and Cognition, 71*(3), 362-368. doi:10.1016/j.bandc.2009.06.007
- Roller, M. (2012, November). Research design review: Interviewer bias & reflexivity in qualitative research. Retrieved from <http://researchdesignreview.com/2012/11/14/interviewer-bias-reflexivity-in-qualitative-research/>
- Russell, G. M., & Kelly, N. H. (2002, September). Research as interacting dialogic processes: Implications for reflectivity. *Forum Qualitative Sozialforschung, 3*(3). Retrieved from <http://www.qualitative-research.net/index.php/fqs/article/view/831/1807>
- Salpeter, J. (2005). Telling tales with technology. *Technology & Learning, 25*(7), 18-24. Retrieved from <http://klillis.wikispaces.com/file/view/Telling+Tales+with+Technology.pdf>
- Schiller, J., & Tillett, B. (2004). Using digital images with young children: Challenges of integration. *Early Child Development and Care, 174*(4), 401-414. doi:10.1080/030044303200015344
- Silberman, S. (2015). *NeuroTribes: The legacy of autism and the future of neurodiversity*. New York, NY: Avery, an imprint of Penguin Random House.
- Simpson, R. L. (2005). Evidence-based practices and students with autism spectrum disorders. *Focus on Autism and Other Developmental Disabilities, 20*(3), 140-149.
- Simpson, R. L., LaCava, P. L., & Graner, P. S. (2004). The no child left behind act: Challenges and implications for educators. *Intervention in school and clinic, 40*(2), 67-75. Retrieved from <http://people.uwec.edu/bonstemj/soc.of.ed/mcclay.pdf>

- Smith, M. K. (2008). Howard Gardner and multiple intelligences. *The Encyclopedia of Informal Education*. Retrieved from <http://www.infed.org/mobi/howard-gardner-multiple-intelligences-and-education>.
- SonicPics. (2015). Digital application. Retrieved from <https://itunes.apple.com/app/sonicpics/id345295488?mt=8>
- Stake, R. E. (1995). *The art of case study research*. Thousand Oaks, CA: Sage.
- Stansberry-Brusnahan, L. L., & Collet-Klingenberg, L. L. (2010). Evidence-based practices for young children with autism spectrum disorders: Guidelines and recommendations from the National Resource Council and National Professional Development Center on Autism Spectrum Disorders. *International Journal of Early Childhood Special Education*, 2, 45-56. Retrieved from <http://www.int-jecse.net/article/view/5000016585/5000016414>
- Stevens, M. (2011). 21st-Century learner: Create! communicate! collaborate! *NEA Today*. Retrieved from <http://www.nea.org/home/46989.htm>
- Storycenter. (2015). How it all began. Retrieved from <http://www.storycenter.org/press/>
- Strauss, A., & Corbin, J. (2008). *Basic of qualitative research: Techniques and procedures for developing grounded theory*. New York, NY: Sage Publications, Inc.
- Sutherland, R., Armstrong, V., Barnes, S., Brawn, R., Breeze, N., Gall, M., Matthewman, . . . John, P. (2004). Transforming teaching and learning: Embedding ICT into everyday classroom practices. *Journal of Computer Assisted Learning*, 20, 413-425.
- Tager-Flusberg, H., Paul, R., & Lord, C. (2005). Chapter 12: Language and communication in autism. In F. Volkmar, A. Klin, R. Paul, & D. Cohen (Eds.), *Handbook of Autism and Pervasive Developmental Disorders* 3rd ed., 335-364. New York, NY: Wiley & Sons. Retrieved from [http://faculty.washington.edu/rab2/Site/AUT501\\_files/Tager-Flusberg,%20Paul,%20Lord%202005%20Language%20and%20communication%20in%20autism.pdf](http://faculty.washington.edu/rab2/Site/AUT501_files/Tager-Flusberg,%20Paul,%20Lord%202005%20Language%20and%20communication%20in%20autism.pdf)
- Talab, R. (2008). Guidelines for writing dissertation proposals and dissertations. Retrieved from [http://coe.k-state.edu/annex/ecdol/Dissertation\\_Guide.pdf](http://coe.k-state.edu/annex/ecdol/Dissertation_Guide.pdf)
- TEACCH Autism Program. (2014). University of North Carolina School of Medicine. Retrieved from <http://teacch.com/>

- Thompson, D. (March, 2014). U.S. autism estimates rise by 30 percent for kids. [WebMD]. Retrieved from <http://www.webmd.com/brain/autism/news/20140327/us-autism-estimates-rise-by-30-percent-for-kids>
- Tjus, T., Heimann, M., & Nelson, K. E. (2001). Interaction patterns between children and their teachers when using a specific multimedia and communication strategy: Observations from children with autism and mixed intellectual disabilities. *Autism*, 5, 175-187. doi:10.1177/1362361301005002007
- Trent, B. E. (2012). Digital storytelling: Promoting literacy through technology. [Kentucky Council of Teachers of English Presentation 2012, February]. Retrieved from <http://kentuckycouncilofteachersofenglish.wikispaces.com/file/view/KCTE%20Print%20Pack.pdf/304543912/KCTE%20Print%20Pack.pdf>
- Truesdale, S. P. (1990). Whole-body listening: Developing active auditory skills. *Language, Speech, and Hearing Services in Schools*, 21(3), 183-184. (EJ415022)
- Turner III, D. W. (2010, May). Qualitative interview design: A practical guide for novice investigators. *The Qualitative Report*, 15(3), 754-760. Retrieved from <http://www.nova.edu/ssss/QR/QR15-3/qid.pdf>
- U.S. Department of Education. (2010). Text of no child left behind statute. Retrieved from <http://www2.ed.gov/policy/elsec/leg/esea02/index.html>
- Wainer, A. L., & Ingersoll, B. R. (2011). The use of innovative computer technology for teaching social communication to individuals with autism spectrum disorders. *Research in Autism Spectrum Disorders*, 5, 96-107. doi:10.1016/j.rasd.2010.08.002
- Wang, W. (2014). Teachers' stages of concern and levels of use of a curriculum innovation in China: A case study. *International Journal of English Language Teaching*, 1(1). Retrieved from <http://www.sciedupress.com/journal/index.php/ijelt/article/view/3310/1959>
- Wang, W. F., & Lam, A. (2009). The English language curriculum for senior secondary school in China: Its evolution from 1949. *RELC Journal*, 40(1), 65-82. doi:10.1177/0033688208101447
- Warreyn, P., van der Paelt, S., & Roeyers, H. (2014). Social-communicative abilities as treatment goals for preschool children with autism spectrum disorder: the importance of imitation, joint attention, and play. *Developmental Medicine and Child Neurology*, 56(8), 712-716. doi:10.1111/dmcn.12455

- Whalon, K. J., Otaiba, S. A., & Delano, M. E. (2009). Evidence-based reading instruction for individuals with autism spectrum disorders. *Focus Autism other Developmental Disabilities*, 24(1), 3-16. doi:10.1177/1088357608328515
- Williams, S. K., Johnson, C., & Sukhodolsky, D. G. (2005). The role of the school psychologist in the inclusive education of school-age children with autism spectrum disorders. *Journal of School Psychology*, 43, 117-136.
- Wimmer, H., & Perner, J. (1983). Beliefs about beliefs: representation and constraining function of wrong beliefs in young children's understanding of deception. *Cognition*. Jan, 13(1). 103-128.
- Wong, C., Odom, S. L., Hume, K., Cox, A. W., Fetting, A., Kucharczyk, S., . . . Schultz, T. R. (2014). *Evidence-based practices in educating children, youth and young adults with autism spectrum disorder*. Chapel Hill: University of North Carolina, Frank Porter Graham Child Development Institute, Autism Evidence-Based Practice Review Group. Retrieved from <http://autismpdc.fpg.unc.edu/sites/autismpdc.fpg.unc.edu/files/2014-EBP-Report.pdf>
- Workshop: Tapping Into Multiple Intelligences. (2014). Thirteen Ed Online. 2004 Educational Broadcasting Corporation. Retrieved from <http://www.thirteen.org/edonline/concept2class/mi/index.html>
- Yin, R. K. (2003). *Case study research: Design and methods* (3rd ed.). Thousand Oaks, CA: Sage.
- Zucker, D. M. (2009). Chapter 14 Teaching research methods in the humanities and social sciences: How to do case study research. Retrieved from [http://scholarworks.umass.edu/cgi/viewcontent.cgi?article=1001&context=nursing\\_faculty\\_pubs](http://scholarworks.umass.edu/cgi/viewcontent.cgi?article=1001&context=nursing_faculty_pubs)

## Appendix A

### Institutional Review Board Approval to Conduct Research



**THE INSTITUTIONAL REVIEW BOARD  
of  
GARDNER-WEBB UNIVERSITY**

This is to certify that the research project titled  
Teachers' Perceptions of the Impact of Digital Photo Stories on Students with Autism Spectrum Disorders

being conducted by Julie J. Conn

has received approval by the Gardner-Webb University IRB. Date 5/18/15

Exempt Research

Signed

[Signature]  
Department/School/Program IRB Representative

[Signature]  
Department/School/Program IRB Member

[Signature]  
David W. Sheehy

Expedited Research

Signed

\_\_\_\_\_  
Department/School/Program IRB Representative

\_\_\_\_\_  
Department/School/Program IRB Member

\_\_\_\_\_  
IRB Administrator or Chair or Institutional Office

Non-Exempt (Full Review)

Signed

\_\_\_\_\_  
IRB Administrator

\_\_\_\_\_  
IRB Chair

\_\_\_\_\_  
IRB Institutional Officer

Expiration Date \_\_\_\_\_

IRB Approval:

☒ Exempt ☐ Expedited ☐ Non-Exempt (Full Review)

Revised 3/10

## Appendix B

### District Informed Consent

May 25, 2015

Dr. Kathy G. Revis, Assistant Superintendent for Curriculum and Instruction  
414 Fourth Avenue West  
Hendersonville, NC 28739

RE: Permission to Conduct Research Study

Dear Dr. Revis,

I am currently enrolled in the Education Doctoral Curriculum and Instruction program at Gardner-Webb University, Boiling Springs, NC. I am requesting permission to conduct a research study in the district at two elementary and two middle schools. The research project is titled, *Teacher perceptions of the Impact of Digital Photo Stories on Students with Autism Spectrum Disorders*.

The purpose of the study is to explore teacher perceptions of the impact a digital photo story has when used as an instructional strategy with children with autism spectrum disorders (ASD). Teachers who teach in the Intensive Intervention classes at Sugarloaf Elementary, Hendersonville Elementary, Hendersonville Middle School and Flat Rock Middle School would conduct one-on-one sessions utilizing a digital photo story tool with a child with autism spectrum disorder. Before and after the completion of the digital photo story project, each teacher of the student with ASD would answer open-ended interview questions. The answers to the questions would be coded and reported in the dissertation process for the study.

Teachers will be provided a consent form to be signed and returned prior to the beginning of research. Copies of the interview questions and consent forms are attached. Your approval to conduct this study will be greatly appreciated. I would be happy to answer any questions or concerns that you may have. You may contact me at 828-702-4840 or email [jconn@gardnerwebb.edu](mailto:jconn@gardnerwebb.edu) or [jjconn@hcpsnc.org](mailto:jjconn@hcpsnc.org).

Sincerely,

Julie J. Conn

Doctoral Candidate, Gardner-Webb University

## Appendix C

### Teacher Participation Consent

Consent Form for Research  
Gardner-Webb University  
College of Education

By signing this consent form, I:

1. Voluntarily agree to participate in the study entitled: Teacher perceptions of the Impact of Digital Photo Stories on Students with Autism Spectrum Disorders.
2. May not personally benefit from this study, but the knowledge gained may benefit others.
3. Am free to refuse to participate and to withdraw from the experiment at any time without prejudice to me.
4. Understand my participation and all documents gained from the study will not be used in an evaluative manner.
5. Acknowledge that records from this study will be kept confidential and, if applicable, pseudonyms will be used in the final document.
6. Agree to participate in training as required.
7. Agree to video record the digital photo story project with a student.
8. Agree to participate in one-on-one audio-recorded interviews with the researcher.

If you have any questions regarding this study, you may contact Julie Conn by phone (828-702-4840) or by email (jjconn@hcpsnc.edu).

Check one box:

- ☐ I choose to voluntarily participate.  
☐ I choose to opt-out of the study.

---

**Printed Name of Participant**

---

**Signature of Participant**

---

**Date**

---

**Signature of Researcher**

---

**Date**

## Appendix D

### Teacher Informational Protocol

## Teacher Informational Protocol

### General Information

1. What is your educational background and degree? \_\_\_\_\_
2. How long have you been teaching (total years including this year)? \_\_\_\_\_
3. How long have you been teaching students with autism spectrum disorders? \_\_\_\_\_
4. How many students are in your classroom? \_\_\_\_\_
5. How many students have autism spectrum disorders in your classroom? \_\_\_\_\_

### Instructional Strategies

Please check (✓) the appropriate boxes of strategies utilized and the frequency implemented in your classroom for students with autism spectrum disorders.

Instructional Strategies	Frequent (hourly)	Often (daily)	Sometimes (once or twice a week)	Rarely (once or twice a month)	Never
Activating Prior Knowledge					
Joint Attention					
Naturalistic Interventions					
Peer Tutoring					
Repeated Reading					
Social Stories					
Technology Assisted Instruction					
Video Modeling					
Visual Cues					
Digital Photo Stories					
Other (briefly describe)					

## Teacher Informational Protocol

General Information: Case #1

1. What is your educational background and degree? Associate of Arts; BS Early Childhood; Intervention Specialist; Pre-K-3rd General Ed.; Birth-3rd Mild/Mod/Severe/Profound

2. How long have you been teaching (total years including this year)? 14 years

3. How long have you been teaching students with autism spectrum disorders? 11 years

4. How many students are in your classroom? 8

5. How many students have autism spectrum disorders in your classroom? 7

## Instructional Strategies

Please check (✓) the appropriate boxes of strategies utilized and the frequency implemented in your classroom for students with autism spectrum disorders.

Instructional Strategies	Frequent (hourly)	Often (daily)	Sometimes (once or twice a week)	Rarely (once or twice a month)	Never
Activating Prior Knowledge	✓				
Joint Attention	✓				
Naturalistic Interventions	✓				
Peer Tutoring				✓	
Repeated Reading	✓				
Social Stories		✓			
Technology Assisted Instruction	✓				
Video Modeling			✓		
Visual Cues	✓				
Digital Photo Stories					✓
Other (briefly describe)					

## Teacher Informational Protocol

General Information: Case #2

1. What is your educational background and degree? Appalachian State 2009; Bachelors-Special Ed-Adapted Curriculum
2. How long have you been teaching (total years including this year)? 5
3. How long have you been teaching students with autism spectrum disorders? 5
4. How many students are in your classroom? 9
5. How many students have autism spectrum disorders in your classroom? 9

## Instructional Strategies

Please check (✓) the appropriate boxes of strategies utilized and the frequency implemented in your classroom for students with autism spectrum disorders.

Instructional Strategies	Frequent (hourly)	Often (daily)	Sometimes (once or twice a week)	Rarely (once or twice a month)	Never
Activating Prior Knowledge		✓			
Joint Attention		✓			
Naturalistic Interventions		✓			
Peer Tutoring				✓	
Repeated Reading		✓			
Social Stories		✓			
Technology Assisted Instruction	✓				
Video Modeling			✓		
Visual Cues	✓				
Digital Photo Stories			✓		
Other (briefly describe) <i>Direct Instruction</i> <i>Guided Reading</i>					

## Teacher Informational Protocol

General Information: Case #31. What is your educational background and degree? Bachelor of Arts degree in Special Education: Adapted curriculum2. How long have you been teaching (total years including this year)? 73. How long have you been teaching students with autism spectrum disorders? 74. How many students are in your classroom? 75. How many students have autism spectrum disorders in your classroom? 7

## Instructional Strategies

Please check (✓) the appropriate boxes of strategies utilized and the frequency implemented in your classroom for students with autism spectrum disorders.

Instructional Strategies	Frequent (hourly)	Often (daily)	Sometimes (once or twice a week)	Rarely (once or twice a month)	Never
Activating Prior Knowledge	✓				
Joint Attention	✓				
Naturalistic Interventions	✓				
Peer Tutoring			✓		
Repeated Reading		✓			
Social Stories			✓		
Technology Assisted Instruction		✓			
Video Modeling				✓	
Visual Cues	✓				
Digital Photo Stories					✓
Other (briefly describe)					

## Teacher Informational Protocol

General Information: Case #4

1. What is your educational background and degree? I graduated from WCU [Western Carolina U.] with a bachelor's degree in Special Education.
2. How long have you been teaching (total years including this year)? 4 years
3. How long have you been teaching students with autism spectrum disorders? 4 years
4. How many students are in your classroom? 4
5. How many students have autism spectrum disorders in your classroom? 3

## Instructional Strategies

Please check (✓) the appropriate boxes of strategies utilized and the frequency implemented in your classroom for students with autism spectrum disorders.

Instructional Strategies	Frequent (hourly)	Often (daily)	Sometimes (once or twice a week)	Rarely (once or twice a month)	Never
Activating Prior Knowledge	✓				
Joint Attention	✓				
Naturalistic Interventions		✓			
Peer Tutoring			✓		
Repeated Reading		✓			
Social Stories		✓			
Technology Assisted Instruction		✓			
Video Modeling		✓			
Visual Cues	✓				
Digital Photo Stories					✓
Other (briefly describe)					

## Teacher Informational Protocol

General Information: Case #5

1. What is your educational background and degree? Appalachian State with a Teaching Theatre K-12 BA
2. How long have you been teaching (total years including this year)? 4th year teaching; I was a teaching assistant for 2 years.
3. How long have you been teaching students with autism spectrum disorders? 4 years
4. How many students are in your classroom? 7
5. How many students have autism spectrum disorders in your classroom? 7

## Instructional Strategies

Please check (✓) the appropriate boxes of strategies utilized and the frequency implemented in your classroom for students with autism spectrum disorders.

Instructional Strategies	Frequent (hourly)	Often (daily)	Sometimes (once or twice a week)	Rarely (once or twice a month)	Never
Activating Prior Knowledge	✓				
Joint Attention	✓				
Naturalistic Interventions		✓			
Peer Tutoring			✓		
Repeated Reading			✓		
Social Stories					✓
Technology Assisted Instruction	✓				
Video Modeling				✓	
Visual Cues	✓				
Digital Photo Stories					✓
Other (briefly describe)					

## Appendix E

### Teacher Preproject Interview Protocol

### Teacher Preproject Open-ended Interview Questions

1. Tell me about your student.
2. Tell me about your student's communication.
3. Tell me about your student's social skills.
4. Tell me about your knowledge/use of the digital photo story process?
  - Probing questions:
  - Have you ever used a digital photo story tool?
  - Have you ever made a digital photo story?
    - If yes, are you novice or closer to expert?
    - If no, what concerns do you have about the process?

### Sample Case #5 Pre-Project Open-ended Interview Questions

*R: 1. Tell me about your student.*

My student is a little girl. She is going to be in seventh grade. She has autism, more the lower functioning side.

*R: 2. Tell me about your student's communication.*

Her communication is limited. She has all of her words but she tends to not want to use them. She prefers to be verbal when she is one on one and is much more shy when she's in a group setting. But she can read up to second grade, first grade level books; and her inflection has gotten better, and her, you know, paraphrasing and things like that. Okay.

*R: 3. Tell me about your student's social skills.*

Okay. Her social skills are probably around, I would say a five to six year old socially, she is very affectionate, very hands on kind of child. She does get distracted easily. She makes great eye contact; and let's see. She uses a device. She loves using her device to communicate with. And she uses full sentences when she types with that. She does not interact much with the other students as far as like just playing but she is very good about communicating like her space needs of if something was taken that was hers--that kind of thing.

*R: 4. Tell me about your knowledge/use of the digital photo story process?*

Probing questions:

Have you ever used a digital photo story tool?

I have never used the digital photo story tool.

*R: Obviously you have not made a digital photo story....*

Yes. I have never made a photo story.

*R: So, you are a novice.*

*R: So, what concerns do you have about the process?*

As of right now I don't feel like I have any concerns. It seems rather pretty straight forward program and um, pretty simple and I think that it's going to be a cool tool to use! Okay?

*R: Thank you!*

Sample: Case #2 Pre-Project Open-ended Interview Questions

*R: 1. Tell me about your student.*

J: The student that I picked to work with is in fifth grade. He has really low academic skills. He's not very motivated academically, and he has some splinter social skills. He's gotten better about making friends, but he still has a really hard time when it comes to, you know, developing deeper relationships with people.

*R: 2. Tell me about your student's communication.*

J: He's extremely verbally savvy. He knows what to say and when to say it. He can tell you all the right things but it's just kind of acting upon it. The only time...sometimes he'll shut down if he gets really upset...but it's usually because of some outside stimulus, he's real sensitive to touch and sometimes sound...

*R: 3. Tell me about your student's social skills.*

J: He's very "I" sighted, he thinks about himself always first-he doesn't have much empathy. And he's gotten better about relating to others but, he lacks empathy mostly and he lacks a sense of responsibility especially if he makes a choice that's not okay he doesn't understand why that might be bad. But then on the other hand if somebody else was to go and do exactly the same thing, he's all up in their business about it. (laughs)

*R: 4. Tell me about your knowledge/use of the digital photo story process?*

Probing questions:

*R: Have you ever used a digital photo story tool?*

J: Yes I have.

*R: Like when did you start using it-do you know how long ago...When did you first start...*

J: Well since I first began here at this school. This will be my fourth year using the digital photo story.

*R: So have you ever made a digital photo story? Yes*

*If yes, are you novice or closer to expert? So you're closer to an expert?*

J: I would guess so and some of my kids know how to do it by themselves too.

~~If no, what concerns do you have about the process?~~

## Appendix F

### Teacher Postproject Interview Protocol

### Teacher Open-Ended Interview Questions

1. What instructional strategies have you used with your students diagnosed with autism spectrum disorders?

Probing Questions: The strategies you describe, how do you feel they access the strengths of your student's learning styles (i.e., Gardner's Multiple Intelligences)?

How do the strategies address the weaknesses of your student's abilities in relation to having a weak theory of mind (i.e. the inability to understand other's feelings), weak central coherence (i.e., unable to see the big picture/focus on details), and weak executive functioning (i.e., unable to organize or strategize solutions)?

2. How would you describe the digital photo story strategy and process?

3. What are your perceptions of the digital photo story's effects on communication for your student with autism spectrum disorder?

Probing Questions: Does the photo story process access the strengths of your student's learning styles in communication (i.e., Gardner's Multiple Intelligences)?

How does the digital photo story process address the weaknesses of your student's abilities in communication in relation to having a weak theory of mind (i.e. the inability to understand other's feelings), weak central coherence (i.e., unable to see the big picture/focus on details), and weak executive functioning (i.e., unable to organize or strategize solutions)?

4. What are your perceptions of the digital photo story's effects on social skills for your student with autism spectrum disorder?

Probing Questions: Does the photo story process access the strengths of your student's learning styles in social skills (i.e., Gardner's Multiple Intelligences)?

How does the digital photo story process address the weaknesses of your student's abilities in social skills in relation to having a weak theory of mind (i.e. the inability to understand other's feelings), weak central coherence (i.e., unable to see the big picture/focus on details), and weak executive functioning (i.e., unable to organize or strategize solutions)?

5. Tell me about something you experienced while utilizing the digital photo story with your student with autism spectrum disorder.

Probing Question: What changes in your ability to utilize the technology during the process did you notice?

6. Tell me about something you would keep the same if you did this again with a different student.

7. Tell me about something you would change if you did this again with a different student.

8. What advantages and disadvantages did you experience from utilizing the digital photo story as a teaching tool with your child with autism spectrum disorder?

Probing Questions: How did your comfort level of use of the tool change as a result of the digital photo story process?

What do you think about the digital photo story's process and product with respect to addressing strengths and/or weaknesses of the child with ASD (specifically related to multiple intelligences or ToM, WCC, and weak EF).

9. Did your involvement in creating and utilizing the digital photo story change your perceptions of your student with autism spectrum disorder's abilities? If so, how and why?

Probing Question: Did you see different strengths or abilities emerge from your student during the photo story process?

10. Did using the digital photo story make a difference in how you may consider future strategies for teaching? Explain your response.

Probing Question: How might the digital photo story be utilized to address the known weaknesses [i.e., weak theory of mind (i.e. the inability to understand other's feelings), weak central coherence (i.e., unable to see the big picture/focus on details), and weak executive functioning (i.e., unable to organize or strategize solutions)] of students with ASD?

Sample: Case #1: Teacher Open-ended Interview Questions

R: *What instructional strategies have you used with your students diagnosed with autism spectrum disorders?*

Probing Questions: The strategies you describe, how do you feel they access the strengths of your student's learning styles (i.e., Gardner's Multiple Intelligences)?

How do the strategies address the weaknesses of your student's abilities in relation to having a weak theory of mind (i.e. the inability to understand other's feelings), weak central coherence (i.e., unable to see the big picture/focus on details), and weak executive functioning (i.e., unable to organize or strategize solutions)?

#1: I use a lot of joint attention. We of course use visual and verbal and I do a lot of kinesthetic touching and its throughout whatever academic or social, emotional thing that we're doing-I try to do all of it for when-and I think it's based what I do more with one student than another based on their individuality and their needs.

**Okay...**

R: #2. *How would you describe the digital photo story strategy and process? So when you were putting your story together, how did that go.*

#1: Well. I obviously had to be trained because it was a brand new thing for me. I've seen it but I've never participated. The person who trained me was good and then I practiced before I did it with the student so. Before I had the student sit with me, I went ahead and took pictures of him doing the things that we were going to be importing and pictures and that he was going to be talking about, reading and typing whatever.

R: *And then you brought them into the tool...*

#1: Oh yes...oh yes.

R: *Did he type or did you type?*

#1: He typed--He has had a little more experience with some spelling test so he understands to do the back to erase and he understands space and he understands--I put the caps lock on for him so he wouldn't have to miss..and I then I put the caps lock off so he could put the punctuation in--again that is extended what he has been learning--he's a first grader and writing sentences and spacing and things like that so...he's got right into it..so.

R: *How did you pick your topic...I think you did a story about some social skills...*

#1: We did whole body listening. And part of this young fellow's school year this year is really to begin moving him more towards inclusion academic activities. He's done specials with them but he's on or above grade level but he's had some significant challenges with his social emotional so

*R: You selected that to help with his social...*

**#1:** Right. And so I do my little small group that I have him in within my classroom... We've been talking about full body listening and he's been very responsive to it so much so that I can just point to -I made a notebook with you know, all the pictures and we've reviewed it over and over and I will use the cue are you using your whole body listening whenever he is off task. So I thought this would be really great if I got his picture doing all the things he's been learning. He was game for that. He thought that was awesome.

*R: 3. What are your perceptions of the digital photo story's effects on communication for your student with autism spectrum disorder? So when you were doing the story, did you see anything occurring with his communication?*

Probing Questions: Does the photo story process access the strengths of your student's learning styles in communication (i.e., Gardner's Multiple Intelligences)?

How does the digital photo story process address the weaknesses of your student's abilities in communication in relation to having a weak theory of mind (i.e. the inability to understand other's feelings), weak central coherence (i.e., unable to see the big picture/focus on details), and weak executive functioning (i.e., unable to organize or strategize solutions)?

**#1:** Yes, as a matter of fact I did. He obviously embraced the tray thing....so that was one more way because he has a hard time with the whole visual motor planning of writing although it's getting better for him. Plus I found him to be willing to try when a lot of times he will be reluctant so I know...I chose him because I know that he's interested in the computer and he's beginning to navigate independently when it's choice time and he can go on the computer. He remembers his login, name and all that so I thought well he would be a great one to practice some of those skills with in the photo story.

*R: #4. It's the same question--only on social skills...so, What are your perceptions of the digital photo story's effects on social skills for your student with autism spectrum disorder?*

Probing Questions: Does the photo story process access the strengths of your student's learning styles in social skills (i.e., Gardner's Multiple Intelligences)?

How does the digital photo story process address the weaknesses of your student's abilities in social skills in relation to having a weak theory of mind (i.e. the inability to understand other's feelings), weak central coherence (i.e., unable to see the big picture/focus on details), and weak executive functioning (i.e., unable to organize or strategize solutions)?

**#1:** Well he has often past issues with following directions so we had a few where we he would jump ahead and wouldn't listen so we had to go back after he did the whole thing we went back and corrected like when he was talking into the microphone he wanted to put the microphone up on his mouth. He wouldn't read what he had written fluently--and then he would say, "Ohhh, I need help." ---which was good because he doesn't often ask for help. Yeah, so it really prompted him to step up, I'm gonna say.

*R: Okay #5. Tell me about something you experienced while utilizing the digital photo story with your student with autism spectrum disorder. Probing Question: What changes in your ability to utilize the technology during the process did you notice?*

**#1:** (Laughs)...Well, I experienced, oh my gosh, I am not very good at this but, it was fun to work through it with him. And, you know he was obviously not critical of me because he didn't know what to be critical of. And I was thrilled that he embraced it because he could have very easily have shut down because he has in the past and won't attempt something but he was game the whole way through. And I was thrilled because truthfully I didn't know if he had the abilities that I hoped that he had and he proved to me that yes he did. So maybe I've been kind of not raising the bar for him enough. You know maybe I could have done this a lot sooner and he could be a lot further. But, another thing that is I asked him if he would like to show other people and he's usually kind of backwards that way, but he said, "Yes" and so, he's let other people come and watch it. And I sent it to his family so I hope that they've been able to pull it up at home. I hope.

*R: #6. Tell me about something you would keep the same if you did this again with a different student.*

**#1:** I would keep actual photos of them. I think that that really pulls....or something you know, whether they've drawn something and we take a picture of it or I think it really pulled this particular boy in by having him in the picture you know, because they all like looking in the mirror and look at themselves. To me, this is hilarious ...just that mirror image--I would definitely do that again somehow...either their work or actual photos of them.

*R: #7. Tell me about something you would change if you did this again with a different student.*

**#1:** I think for me personally, I would practice a little bit more because I wasn't real sure about how to go back in and then do the ...I had forgotten about changing the page, you know, the fade in, the fade out, or you know, turn the page. I couldn't remember how to do that and I didn't want to take up time with the student while I was trying to figure it out. So I would definitely practice that so I feel a little bit more fluent in my ability to run them through the process.

*R: #8. What advantages and disadvantages did you experience from utilizing the digital photo story as a teaching tool with your child with autism spectrum disorder?*

**Probing Questions:** How did your comfort level of use of the tool change as a result of the digital photo story process?

What do you think about the digital photo story's process and product with respect to addressing strengths and/or weaknesses of the child with ASD (specifically related to multiple intelligences or ToM, WCC, and weak EF).

**#1:** Well, obviously, the advantages were all the things I said positively prior for him. A disadvantage was finding time that was uninterrupted and quiet during the school day. I think that's a disadvantage with this population and this type of classroom...and this

student looks forward to his recess time and then I didn't want to take that away. Just finding other people to cover while we actually worked on this--I guess would be a disadvantage for it.

*R: 9. Did your involvement in creating and utilizing the digital photo story change your perceptions of your student with autism spectrum disorder's abilities? If so, how and why? And you kind of talked a little bit about that.*

Probing Question: Did you see different strengths or abilities emerge from your student during the photo story process?

**#1:** Yes I did. I was kind of, I was pleasantly surprised that he embraced it for one thing and then I, you know, turned that finger back at me and said well maybe you should have been doing this ahead of, you know, more, prior to this actual time. So, I think maybe I don't always know what they can do....and to build them to the next level because I think that maybe they can't, when in fact they probably can. And even if they *can't I can get all I can out of* creating it I sure almost any student in my classroom would enjoy it too.

*R: 10. Did using the digital photo story make a difference in how you may consider future strategies for teaching? Explain your response.*

Probing Question: How might the digital photo story be utilized to address the known weaknesses [i.e., weak theory of mind (i.e. the inability to understand other's feelings), weak central coherence (i.e., unable to see the big picture/focus on details), and weak executive functioning (i.e., unable to organize or strategize solutions)] of students with ASD?

**#1:** (Laughs) Definitely, definitely. Because I know that we are going to be going a field trip and I think that would be a great way to take pictures of them while they're there and then come back and download the pictures and let them each narrate and you know, participate in creating this digital, you know, remembering of what we did. You know, that's just one way. I'm sure there's lots and lots of other ways-but, that's just the one that comes to mind. I will use it. Now that I kind of know how to do it I will definitely use it again!

Sample: Case #3: Teacher Open-ended Interview Questions

*R: 1. What instructional strategies have you used with your students diagnosed with autism spectrum disorders?*

Probing Questions: The strategies you describe, how do you feel they access the strengths of your student's learning styles (i.e., Gardner's Multiple Intelligences)?

How do the strategies address the weaknesses of your student's abilities in relation to having a weak theory of mind (i.e. the inability to understand other's feelings), weak central coherence (i.e., unable to see the big picture/focus on details), and weak executive functioning (i.e., unable to organize or strategize solutions)?

**#3:** I've used social stories. I've used video modeling. We do movement activities. Regarding behavior we, I've used ABA and some discreet trial training. I have used direct instruction and then when it comes to like academic strategies I've tried to align myself as much as possible with what our school initiatives are so I've used, I've done like small groups and guiding reading and started to do some guided math as well.

Okay. And, so those do address..like kids with autism...those are all pretty evidence-based practices--right, you feel they're pretty good ones you use..

**#3:** Yes.

*R: How would you describe the digital photo story strategy and process?*

**#3:** Well I started by trying to access student interest and picked a topic I felt like the student I was working with was interested in. I let him give me feedback and then we did some reading, background reading on that topic and we together talked about some ideas that we might want to put in the photo story for sentences. Like, we found facts I we thought would be good and I kind of jotted them down. Then we looked at pictures that kind of corresponded to each one of the facts and the student helped me choose photos that he wanted to include in his photo story. After that is when I kind of started assembling the photo story and paired the text with the photos and then finally, the student recorded himself reading the facts that we had discussed along with each picture and then the final thing was, we watched it back....I kind of skipped over a step...as we were going through recording I was able to give him direct feedback on his reading and then when we watched it back, I also followed up by asking him some questions about some facts on the photo story.

*3. What are your perceptions of the digital photo story's effects on communication for your student with autism spectrum disorder? Did it access the strengths of your student's learning or address the weaknesses?*

Probing Questions: Does the photo story process access the strengths of your student's learning styles in communication (i.e., Gardner's Multiple Intelligences)?

How does the digital photo story process address the weaknesses of your student's abilities in communication in relation to having a weak theory of mind (i.e. the inability to understand other's feelings), weak central coherence (i.e., unable to see the big

picture/focus on details), and weak executive functioning (i.e., unable to organize or strategize solutions)?

**#3:** I think it did both. I think it accessed the strengths because it played on, we were able to find a topic that he was interested in so it was highly motivating for him. The student also is good at reading-and so he felt confident in reading. But then it also addressed areas of weakness for him because when he was able to listen back to the story he..and I gave him feedback about voice volume and clarity-then he was able to address those things..he could kind of hear what parts of communication maybe weren't so good and responded to my feedback and he corrected those things when I prompted him to do so.

*R: 4. What are your perceptions of the digital photo story's effects on social skills for your student with autism spectrum disorder? Did it access the strengths of your student's learning or address the weaknesses as it applies to the social skills?*

Probing Questions: Does the photo story process access the strengths of your student's learning styles in social skills (i.e., Gardner's Multiple Intelligences)?

How does the digital photo story process address the weaknesses of your student's abilities in social skills in relation to having a weak theory of mind (i.e. the inability to understand other's feelings), weak central coherence (i.e., unable to see the big picture/focus on details), and weak executive functioning (i.e., unable to organize or strategize solutions)?

**#3:** Well, definitely it increased..since it was highly motivating I think the student engagement and the activity was offset is a weakness for this particular student-- joint attention and ..like that. and attending to something with me--so it definitely addressed that..and I think one of the things that I didn't mention in the steps to follow up was being able to share his story with other students and feelings, you know, like he's showing something that he did and felt and in that in another way kind of plays to the social skills piece of it and being able to share something that he created and something that he is proud of..with others.

*5. Tell me about something you experienced while utilizing the digital photo story with your student with autism spectrum disorder.*

Probing Question: What changes in your ability to utilize the technology during the process did you notice?

**#3:** Well, I personally was also highly motivated to this because I'm a beginner to photo story so even though I was nervous at first, when I saw like how engaged and excited the student was and wanting to do it and how he was responded to feedback when I would say, "okay we have to slow that down" or "we have to change our voice volume"—when it was given as a prompt, that made it more of a highly motivating thing for me.

*R: 6. Tell me about something you would keep the same if you did this again with a different student.*

**#3:** I like being able to kind of being able to access the background knowledge and learn about the topic ahead of time. Definitely I think like taking a subject the student is

interested in learning about and then, like learning about it outside of the realm of photo stories and then putting it in the photo story, that's something I would want to do again in the future.

*R: 7. Tell me about something you would change if you did this again with a different student.*

**#3::** I don't necessarily think I would change the order or the set up with the student because I felt really positive about that but I think in the future I wanted to spend more time playing around with the photo story on my own before using it with the student just because to see the capabilities and maximize the potential of the tool

*R: 8. What advantages and disadvantages did you experience from utilizing the digital photo story as a teaching tool with your child with autism spectrum disorder? And also... How did your comfort level of use of the tool change as a result of the digital photo story process?*

What do you think about the digital photo story's process and product with respect to addressing *strengths and/or weaknesses* of the child with ASD (specifically related to multiple intelligences or ToM, WCC, and weak EF).

**#3::** Well, I definitely think the disadvantage for me was just that I was a novice so I -- not being experienced like I kind of mentioned in the last question, I think it was a positive tool but I think I could--as I get more comfortable with it and the more that I use it as a tool I think I could maximize the potential of it...and especially use it specifically for students' needs and really kind of cater it to my individual students in my groups' needs. But I think the advantages of it are mastering it and there's so much potential there you know to work on literacy skills and language skills and social skills and even technology skills So...

*R: 9. Did your involvement in creating and utilizing the digital photo story change your perceptions of your student with autism spectrum disorder's abilities? If so, how and why?*

Probing Question: Did you see different strengths or abilities emerge from your student during the photo story process?

**#3::** Well I would say, yes it did, because here we are at the beginning of the school year and so I'm still kind of learning about this particular student it really just showed me a whole new range of his strengths and interest that I wouldn't have known were there. Especially with technology this - in my experience with this student in the past...his interest in technology has been very number based...want to work with calculators and time based with the technology tools that we have--so it was really really cool to see him engage with a technology tool and a teaching tool that was more reading based and language based.

*R: 10. Did using the digital photo story make a difference in how you may consider future strategies for teaching? Explain your response.*

Probing Question: How might the digital photo story be utilized to address the known

weaknesses [i.e., weak theory of mind (i.e. the inability to understand other's feelings), weak central coherence (i.e., unable to see the big picture/focus on details), and weak executive functioning (i.e., unable to organize or strategize solutions)] of students with ASD?

**#3:** I think it's just another tool that I'll be able to add to my tool kit. And as I kind of mentioned in some earlier questions, I think the more that I use it and the more comfortable I get with it I could really use it to meet the unique needs of each student in my class. All those different needs...I am already kind of forming in my brain how I could use it for like word practice for one student, and then for another student it could be used, you know, to work on higher level comprehension skill or it could be used specifically for students demonstrating their understanding of science concepts...there's just so many different uses that I could see using photo story for....and it, can help me to be. I think it's a tool that I'll definitely be able to use a lot and an effective tool that I'll be able to use a lot in my classroom from here on out.

## Appendix G

### Student Information Protocol

## Student Information Protocol

- ☐ male  
☐ female

age \_\_\_\_\_ grade level \_\_\_\_\_

Range of ability on Autism Spectrum (mark on the line where the student ability falls):

low \_\_\_\_\_ medium \_\_\_\_\_ high

Range of verbal ability

low \_\_\_\_\_ medium \_\_\_\_\_ high

Range of communication ability

low \_\_\_\_\_ medium \_\_\_\_\_ high

Range of social skills ability

low \_\_\_\_\_ medium \_\_\_\_\_ high

Notes:

Appendix H  
Parent Informed Consent

Dear Parents,

I am asking your permission to include your child in a research project that will help determine if the digital photo story used as an instructional strategy impacts communication and social skills with children with autism spectrum disorders. The research project is part of the fulfillment of my studies as a doctoral student at Gardner Webb University, NC. This study is not being conducted or sponsored by your child's school or the school district. The study is an observation study and no funding sources are necessary or applicable.

This form provides you with information about the study. Please read the information below and ask questions about anything you don't understand before deciding whether or not to allow your student to take part. Your participation is entirely voluntary and you can refuse to participate without penalty or loss of benefits to which you are otherwise entitled.

**Title of Research Study:**

Teacher perceptions of the Impact of Digital Photo Stories on Students with Autism Spectrum Disorders

**What is the purpose of this study?**

The goal of this study is to collect interview information from your child's teacher and complete an observation of your child's teacher conducting a lesson using the digital photo story as an instructional strategy with your child to determine if the digital photo story impacts communication or social skills.

**What will be done if you allow your child to take part in the research study?**

This project will involve my visitation to your child's classroom to video record your child's teacher making a digital photo story with your child in order to learn about the digital photo story's impact on communication and social skills for students classified with autism. During the observation, I will be observing and recording your child's teacher and your child reviewing photos for the story, observing the teacher and child recording the voice-over for the story and watching the teacher and child view the completed story together.

In order to evaluate the effectiveness of the digital photo story strategy for children with autism spectrum disorders, I (the researcher) will use several methods to gather information regarding teacher experiences and perceptions of the teaching strategy.

*Interviews:* Interviews with the teacher will be conducted in order to gain a deep understanding of the teacher participant's experiences and perceptions of the digital photo story as an instructional strategy. Each teacher participant will complete formal interviews on two occasions: before the lesson and after the lesson. These interviews will take place at the teacher's school site, at a time that is convenient for the teacher. The interviews discussing the digital photo story as an instructional strategy will last about 30 to 60 minutes for the teacher.

*Audio Taped Recordings of Interviews:* Each teacher's interview will be audio-recorded. In order to protect the privacy of the teacher, the cassette will be coded so that no personally identifying information is visible. The tapes will be heard or viewed only for research purposes by the researcher and participant. The tapes will be erased once they have been transcribed and reviewed for accuracy by the teacher participant.

*Video Recordings and Teacher/Child Observation:* The observation will be based on video-recorded viewings of the photo story lesson recorded during the teaching session. The videos will be viewed only for research purposes by the researcher and participant. The videos will be disposed once they have been transcribed and reviewed for accuracy by the teacher participant.

*Field notes:* I (the researcher) will keep running logs of noteworthy events/interactions between the teacher and the child during the digital photo story lesson.

**What are the possible discomforts and risks?**

There are no known discomforts or risks for participants at this time.

**What are the possible benefits to you or to others?**

It is hoped that your permission to allow the participation of your child to be observed will facilitate a better understanding of the important elements in digital photo stories for children with autism spectrum disorders. Your child's participation in this research may help to strengthen his/her communication and social skills, and it may provide teachers and parents strategies to further facilitate communication and social skills development for children with autism spectrum disorders.

**If you choose to take part in this study, will it cost you anything?**

There are no financial costs for your participation in this study.

**When may I review the video-recorded lesson of my teacher and child?**

Parents/guardians of the child observed during the lesson may watch the video-recorded lesson after the completion of the lesson. You may arrange a time at your convenience with the researcher to view the recorded video of the lesson upon completion prior to the destruction of the video.

**Will you receive compensation for your participation in this study?**

No compensation will be provided for you or your child in this study.

**What if your child is injured because of the study?**

Participants' involvement is not associated with physical risk. No treatment will be provided for research related injury and no payment can be provided in the event of a medical problem.

**If you do not want to allow your child to take part in this study, what other options are available to you?**

Participation in this study is entirely voluntary. You are free to refuse permission for your child to be in the study, and your refusal will not influence current or future relationships with the school, school district or Gardner-Webb University.

**How can you withdraw your child from this research study and who should I call if I have questions?**

If you wish to stop your child's participation in this research study for any reason, you should contact: Julie Conn at (828) 702-4840. You are free to withdraw your consent and stop participation in this research study at any time without your current or future relations with your teacher or the school being affected.

**Who will see the results and for what purposes?**

Authorized persons from Gardner-Webb University and the Institutional Review Board have the legal right to review the research records and results. The completed study will be published as part of fulfillment for the doctorate degree. The published dissertation will be available through appropriate library sources. The results of the study will serve as a guide for clinicians and educators who work with children with autism spectrum disorders reviewing the digital photo story as an instructional strategy.

**How will your privacy and the confidentiality of the research records be protected?**

Authorized persons from Gardner-Webb University and the Institutional Review Board have the legal right to review the research records and will protect the confidentiality of those records to the extent permitted by law. Otherwise, research records related to your child will not be released without your consent unless required by law or a court order.

If the results of this research are published or presented at scientific meetings, your identity will not be disclosed. Video-recordings of the lesson and audio tapes of interviews will be kept coded so that no personally identifying information is visible to protect the privacy of participants. All data will be kept in the locked file cabinet and only I (the researcher) has the key. Once the study is complete, the tapes/videos will be erased or destroyed. Records from this study will be kept confidential and, if applicable, pseudonyms will be used in the final document.

**Will the researcher benefit from your participation in this study *[beyond publishing the results as part of fulfillment for the doctorate or presenting the results]*?**

The information in this study will be used to facilitate a discussion about the impact of the digital photo story as an instructional strategy for children with autism spectrum disorders. This information will serve as a guide for clinicians and educators who work with children with autism spectrum disorders.

If you have any questions, please feel free to contact me at any time: 828-702-4840. If you have any questions about your child's rights as a participant in this study, please feel free to contact Dr. Jeff Rogers, IRB Institutional Administrator at (704) 406-4724 or email at [jrogers3@gardner-webb.edu](mailto:jrogers3@gardner-webb.edu).

If you agree to allow your child to participate, please sign the attached paper and return it to me or your child's teacher at your earliest convenience. I hope that I get the

opportunity to observe your child in what I believe will be an interesting and important project for your child and other students with autism spectrum disorders.

Thank you,

Julie Conn,  
EC Elementary Teacher and Gardner-Webb Doctoral Student

Parent/Guardian Consent Form for Research  
Gardner-Webb University

By signing this consent form, I:

1. Voluntarily agree to allow my child to be video-recorded in a teacher/student one-on-one lesson in the study entitled: Teacher perceptions of the Impact of Digital Photo Stories on Students with Autism Spectrum Disorders.
2. May not personally benefit from this study, but the knowledge gained may benefit others.
3. Am free to refuse to allow my child to participate and to withdraw from the study at any time without prejudice to me.
4. Understand my child's video-recorded lesson and all documents gained from the study will not be used in an evaluative manner.
5. Acknowledge that records from this study will be kept confidential and, if applicable, pseudonyms will be used in the final document.

You have been informed about this study's purpose, procedures, possible benefits and risks, and you have received a copy of this Form. You have been given the opportunity to ask questions before you sign, and you have been told that you can ask other questions at any time. You voluntarily agree to allow your child to participate in this study. By signing this form, you are not waiving any of your legal rights.

If you have any questions regarding this study, you may contact Julie Conn by phone (828-702-4840) or by email (jjconn@hcpsnc.edu).

**Check each box that applies:**

- ☐ I give my permission to allow my child to be video-recorded during the photo story lesson for the research project acquiring teacher perceptions' of the impact of the digital photo story with students with autism for research conducted by Julie Conn through Gardner-Webb University.
- ☐ I choose to opt-out of the study.

---

**Printed Name of Parent or Legal Guardian of Child**

---

**Signature of Parent or Legal Guardian of Child**

---

**Date**

---

**Signature of Researcher**

---

**Date**

Appendix I  
Reflexive Journal



## Reflexive Journal

Date	Session	Reflexive Journal
July 30, 2015	Met with Case #s 1 and 2 teachers to discuss Parent Consent Forms; set up training dates for the photo story process, obtain participant permission forms, and left the teacher protocols to be completed by the two teachers.	<p>Participating teachers Case #1 and Case #2 work at an elementary year round schedule school. Classes had started July 13 so I contacted these two teachers first to create a timeline to complete the research. Both teachers indicated they would like a couple of weeks to get their classes up and running and get to know new students and reorientate returning students.</p> <p>I received permission to conduct the research with my approved district approved parent consent form on July 27, so I am able to officially begin the research.</p>
August 4, 2015	<p>Met with Case #s 1 and 2 teachers to conduct (audio record) the pre-interview questions and affirm training date for the photo story and assure the participating teachers had determined which child they would use to make a photo story with and obtain the required parent permission.</p> <p>Emailed the principal of the participating teachers' school to provide the Principal Informed Consent and note the approval from the district level to conduct research. (the year round schedule school).</p>	<p>I felt strange acting in the role of interviewer. Because of my relationship with the two participants [who work in the same teaching capacity as I in the Intensive Intervention EC class and district employee], I knew they knew my perspective on the digital photo story to some degree...and I did not want to influence their answers in any way. I purposefully did not discuss my opinions or my personal involvement with digital photo stories. Because the pre-project interview questions were geared more to their basic understanding of the process, I was able to keep from presenting any positive or negative personal feelings about the process. The pre-interview questions and answers were straightforward and unbiased.</p> <p>After the interviews, I immediately transcribed the audio recordings.</p>
August 9, 2015	Case #s 1 and 2 received an hour lesson on how to use the digital photo story tool. The lesson was conducted by a district employee (who	Prior to the training, I met with the Digital Photo Story trainer who had determined to show the teachers how to use Microsoft Photo Story 3 (the school district has this as an app on all the

	<p>teaches computer) knowledgeable with the process and provided each teacher with a working microphone to ensure equipment would not be an issue. Both teachers reported to have access to microphones, but were happy to have the extra microphone with a headphone, too.</p>	<p>computers) and introduce the teachers to iPad apps that provide the same process. SonicPics and several others are available for download. The teachers had free choice of what app to use to construct the digital photo story.</p> <p>It was important to have an independent trainer who was able to demonstrate how to use the program without flooding the participants' minds with positive or negative "feelings" about how the app could or would work with their student.</p>
August 10, 2015	<p>Emailed with Cases #1 and #2 to schedule video recording for the photo stories. Case #1 was a novice with the tool and Case #2 considered herself near an expert level with the tool. Case #1 wanted some time to explore how to use the tool before making a story with the student.</p>	<p>My goal is to keep the teachers focused on a tight timeline to be able to get the stories completed before I start back to my school on the traditional schedule. I know I need to provide time for the teachers to feel right and make sure each parent has signed the permission form for the student to be observed and video recorded. This process seems to be moving fairly well.</p>
August 12, 2015	<p>Case #1 had a family emergency (her father is moving from rehab into assisted living) and her timeline has been adjusted forward two days. She has been wonderful and stated she is committed to continue with the research; she just needed a couple of extra days.</p>	<p>I realize I must not panic and allow the participating teachers time...even if it means it will move my completion of the research out or inconvenience me, having perhaps to get to their school to observe at times right for them and not for me. Take a breath, breathe deeply, slow down and relax. This means an adjustment in my video recording time (I had hoped to video record on the same days at the same school)...this may not happen!</p>
August 18, 2015	<p>Traditional school started back with a teacher work week on Aug. 17. I contacted Case #s 3, 4 and 5 (teachers on the traditional schedule) to discuss Parent Consent Forms; set up training dates for the photo story process, obtain participant permission forms, and left the teacher protocols to be completed.</p>	<p>This information was straightforward and matter-of-fact. It involved scheduling and checking to see if the teachers were still interested in participating in the research.</p>

August 19 & 20, 2015	Video recorded Case #1 and #2--gathering photos and set-up for the making of each teachers' photo story.	<p>I acted as an non-participant observer. No talking or discussing with the teachers. Case#1 took photos of her student pointing his eyes and mouth, sitting quietly, etc--all parts of behavior expectations provided on a social skills chart. She then had him upload the photos into the photo story app. Case #2 took a photo of each student and had each student in her class write a sentence for what makes them a "good friend."</p>
August 21, 2015	<p>This was a teacher workday, so Case #s 3, 4 and 5 received an hour lesson on how to use the digital photo story tool. The lesson was conducted by the same district employee (who trained Case #s 1 and 2) knowledgeable with the process and provided each teacher with a working microphone to ensure equipment would not be an issue. Once again, the teachers reported to have access to microphones, but were happy to have the extra microphone with a headphone, too. Each of these teachers reported to be novices with the digital photo story process.</p> <p>Video recorded Case #1 and #2--final making of the photo story. Cases #1 and 2 had the students complete writing the words onto the photos in the photo story. The two students recorded their voice on the story. The story was played back for the class to watch.</p>	<p>As with the training with Case #s 1 and 2, it was important to have an independent trainer who was able to demonstrate how to use the program without flooding the participants' minds with positive or negative "feelings" about how the app could or would work with their student.</p> <p>I did receive an email from one teacher after the training who had a question about how to adjust the audio settings on the computer to connect to the microphone. There was a need to go into the Control Panel on Audio and "connect" the microphone.</p> <p>At this point, I know I have one "expert" and four novices with the digital photo story process as the participating teachers. I think this will provide a better finding about Levels of Use because it will be more interesting to see the teachers start at LoU of 0 or 1 and go, hopefully, up on the scale! Having an expert will provide information to be able to compare with her LoU and her experiences and the novices' experiences.</p> <p>I was a non-participating observer. I did not talk or make suggestions or interfere in any way with the building or making of the digital photo story. I think I did a pretty good job of "staying out" of the process or contributing any biases to the</p>

		research! There were times I wanted to step in and offer advice. I did not.
August 24, 2015	Emailed the principal of the participating teachers' schools to provide the Principal Informed Consent and note the approval from the district level to conduct research. (Traditional Schedule schools)	<p>I received emails back from each of the four schools' of the participating teachers' principals acknowledging the research and wishing me "Good luck." Each offered support with anything I may need from them. This is encouraging. I was hoping there would be no more glitches after the process of trying to get the parent consent letter approved at the district level.</p> <p>I am concentrating on how to ensure I just record the process and not interfere at all while the teachers complete their projects. I have explained that if something technical goes wrong, I also have my "computer training" in the wings. I am staying out of the process completely.</p>
August 25, 2015	Case #s 3, 4 and 5 participants each emailed or texted to tell me they were going to use a returning student (for the study) they had taught the previous year (these teachers all teach a self-contained special education class and the students usually remain in the setting two to three, even four years or more with the same teacher).	I must say, this news is very wonderful, because it means I can start the research much sooner than I had hoped with the traditional school schedule participants!
August 26, 2015	Case #5 decided her topic would be using photos of her students demonstrating emotions used on a program she uses called the Zones of	<p>I set up video recording sessions for each participant. I know I will have to sit on my hands and remain very quiet when I watch the teacher make the story with the student.</p> <p>8/26 a.m. Case #5: First teacher on the traditional school schedule ready to video record. The student doing the story is a student I taught from kindergarten to fifth grade. The student was excited to see me. After initial greetings, I was able to ease away and</p>

	<p>Regulation. Because she will be using all of her students, I only recorded the portions of the process with the participating student.</p>	<p>allow the student to go back with her teacher and no more was said to me. The student became very involved in making the story and concentrated on her reading and her teacher.</p> <p>The lesson took three short sessions. The first lesson, the teacher took photos of the student demonstrating (or showing) emotions, to go with the Zones of Regulation. The teacher took the photos and uploaded them into her computer, then loaded them into the Photo Story tool. Lesson took about 7 minutes.</p> <p>Lesson #2: Case #5 teacher had taken other students' photos as well, and had loaded them into the photo story tool. The participating student recorded: "When I am in the blue zone, I feel shy. When I am in the green zone, I feel relaxed."</p> <p>Student had a 2 minute break.</p> <p>Lesson #3 Student had waited for other students to record. She was called back on her turn and recorded: "When I am in the red zone, I feel aggressive."...and then, "When I am in the yellow zone, I feel upset."</p> <p>The teacher had elected to do an all class photo story. She had each of her 7 students respond to different personal photos of themselves making "emotions."</p>
August 26, 2015 p.m.	<p>Case #4 emailed the parent of her selected student and received from the parents two emails with several vacation photos they thought would be fun for the child to make a story with. Video recorded 9 short student photo story building sessions.</p>	<p>The student doing the story is a student I taught from kindergarten to fifth grade. The student was excited to see me, but is considered basically non-verbal ASD. I was able to record the entire process in under an hour because the student chose to be very cooperative this day. The student was able to do one word per picture. He had to do several takes on each picture. The session was typical</p>

		(says the teacher) for this mostly "non-verbal" student with ASD.
August 27, 2015	Case #1 Postproject Interview	Went to the year-round elementary school at 3:30. Completed the postproject interview with Case #1 teacher.
August 27, 2015 a.m. and p.m.	Case #3 allowed the student to pick a topic of choice (teacher approved) and located relevant photos with her student on the internet.	<p>The student doing the story is a student I taught in kindergarten and is now in first grade. The student is very verbal. He was excited to be making a story with his new classroom teacher (I had done them with him in kdg.).</p> <p>In the morning, the teacher and student went on the internet and found pictures of "deer"--a student choice for the photo story. The teacher loaded them into the tool and typed the words onto the pictures. (The student does not yet use the keyboard well). The story was all lined up to be completed in the afternoon.</p> <p>I had to be very careful not to get involved with the process--there were many times I wanted to say, "Move the microphone closer" or, "Talk to him more about the photo before he just reads it!"</p>
August 28, 2015	Case #3-Class showing of completed photo story.	The teacher showed the video to her whole class and my class of students before the showing of our "Friday afternoon" video. I watched the students and the teacher...and the video was watched twice. Two students asked when they were going to make their stories.
August 28, evening 2015	Contacted all teacher participants to set time for Postproject Interviews. Case #4 Postproject interview completed.	Conducted postproject interviews with Case #4. Read the questions as presented and did ask some of the probing questions. It was a good interview and I transcribed the interview immediately after the session.
August 29, 2015	Cases #2, 3 and 5 postproject interviews. Worked on the coding for interviews and observations.	I completed postproject interviews on this Sunday afternoon. I did each teacher individually on their own time in the afternoon (1:00, 3:00 and 7:00). I

		transcribed as much as I could after each interview...will complete transcribing on Monday.
September 1-2, 2015	<p>Reviewed all of the video recordings. Checked field notes and added in any conversations I had not noted. Worked on the coding for interviews and observations.</p> <p>Sent out the Teacher Letter to Participant along with the transcripts of the interviews and observations to each participating teacher. The letter is part of process to check on validity of the collected data (member checking).</p> <p>The school psychologist has been reading the transcribed and coded interviews and observations.</p>	<p>I am glad I was able to "stand back" and remove myself from the process. It was very very hard to not want to jump in and offer help to each teacher or make suggestions. I feel once I have written the dissertation findings...I will have time to go back to each teacher and check in with them to see if they will continue to use the photo story as a tool as each indicated they would. I will be excited to maybe offer some additional training to make the lessons more meaningful for teacher and student!</p> <p>The school psychologist added in a code: P for picture cues. I had not remembered to consider the most obvious of the strategies---the pictures and photos!</p>
September 3	Writing Chapters 4 and 5	Coded the interviews and observations. The process is somewhat straightforward, so I am able to state in structured format what the teacher and student are doing. Using the Peer Reviewer notes to stay focused and not interject my feelings.
September 6, 2015	All participants have approved transcripts.	I note this here to address any "biases of the researcher" were not found in the questioning, transcribing, or coding of the material.

## Appendix J

### Observation Field Notes Protocol and Coding

Date	Teacher	Instructional Activities	Initial Codes

## Sample 1 of Observational Field Notes: Case #3

Date	Teacher	Instructional Activities	Initial Codes
August 27, 2015	Case #3	<p>Case #3: Teacher-Student Session 2 Making the Story</p> <p>Case #3 teacher told the student the pictures had all been put in order in the story tool. She stated, <u>"It is time to put your voice on the story. You are going to read!"</u> <b>I, A</b> The student stood up and came to the desk where the computer was that had the story loaded on it and the headphones with the mic were sitting. The teacher (to the right of the student) and student sat next to each other with the teacher holding the headphone/mic in her left hand in front of the student and controlled the mouse (to the computer) by her right hand. The teacher stated, <u>"Okay, [student] are you ready?"</u> <b>I</b> The student raised his shoulders and looked at the screen and said, <u>"Yes."</u> <b>S+</b> The teacher then said, <u>"Okay, when I push this button in, you start reading. Are you ready?"</u> She pushed the button--the student made no sound. The teacher whispered, <u>"Go."</u> <b>I</b> The student read the title, <u>"All About Deer"</u> <b>SE</b> in a louder audible voice. The student remained focused on the picture on the screen. The teacher said, <u>"Let's try that one again."</u> <b>I</b> The student read louder, <u>"All About Deer."</u> <b>SR SE, RR, P, C</b> The teacher said, <u>"Oh that was pretty good! But you know what? That was so fast, I couldn't even hear it. Try it again, say it slower like this (the teacher then read the title slowly) "all about deer."</u> <b>F, R, I, M, C</b> The student read slower <u>"All About Deer."</u> <b>SR, SE, RR</b> The teacher put her hand out towards the student and said, <u>"Give me five. That was awesome."</u> <b>R, F</b></p> <p>The student tapped the teacher's hand and looked back at the screen. <b>S+</b> The teacher said, <u>"Let's do the next slide."</u> <b>I</b></p>	<p>A=Activate Prior Knowledge</p> <p>I=Instructional</p> <p>M=Modeling</p> <p>R=Reinforcement</p> <p>F=Feedback</p> <p>SR=Student responding to instruction</p> <p>SE=Student Engagement (reading)</p> <p>S+ =Student Response Positive</p> <p>S- =Student Response Negative</p> <p>J=Joint Attention</p> <p>RR=Repeated Readings</p> <p>P=Picture Cues/Visual Cues</p> <p>SS=Social Story Style</p> <p>C=Computer Assisted Instruction</p>

		<p>The student sat up straight and looked at the picture. He made an audible, "aaah" and read, "A male deer is called a buck." <b>SR, SE, P</b></p> <p>The teacher said, "I love how you read that nice and slow. (Teacher lifts up headphone and places it between her ear and student's ear.) Let's do a little preview and see if we can hear that. We want to make sure the volume is right. Should we preview it? Let's listen." <b>R, I, F</b></p> <p>Both lean in to listen. <b>J</b></p> <p>Teacher says, "Oh, I couldn't hear it." <b>J, F</b></p> <p>Student says, "Why you couldn't hear it?" <b>J, SR</b></p> <p>Teacher talking at same time says, "This time read it slow, like, 'A male deer is called a buck'...but a little louder. Okay?" <b>I, M, F</b></p> <p>The student reads louder.. "A male deer is called a buck" (dropping the word buck a little). <b>SR, SE, RR</b></p> <p>Teacher smiles <b>R</b> and says, "one more time, that was pretty good but say, 'A male deer is called a buck' "(not dropping the word buck). <b>I, M, J, F</b></p> <p>Student reads again, "A male deer is called a buck." <b>SR, RR</b></p> <p>Teacher clicks to next picture and says, "Next!" <b>I</b></p> <p>Student reads, "A female deer is called a doe." (slowly and loud) <b>SR, SE, P</b></p> <p>Teacher says, "Wow! Give me five. That sounded awesome. Alright." <b>R, F, J</b></p> <p>Teacher extends her hand and student and teacher 'give five' (slap hands together). <b>J, R</b></p> <p>Student turns towards teacher and smiles. <b>S+, J</b></p> <p>Teacher is smiling. <b>R, F, J</b></p> <p>Teacher clicks on next picture. <b>I, C</b></p> <p>Student immediately moves mouth towards mic and with a loud and slow voice reads, "A baby deer is called a fawn." <b>SR, SE, P</b></p> <p>Student leans back in the chair...still looking at the screen.</p> <p>Teacher clicks to next picture, student emits a small 'gasp' and student sits forward and starts</p>	
--	--	--	--

		<p>to read, "A group of..". Teacher says, "<u>Oh wait a minute, I didn't press record yet.</u>" <b>F</b> (Chuckles). Students looks at video recording camera. Teacher says, "<u>Are you ready?</u>" <b>I</b> Student turns back to mic, emits a small 'ah' and says, "<u>Yes</u>" (emits small gasp). "A group of deer is called a herd." <b>SR, SE</b></p> <p>Teacher says, "<u>You got that word right. Let's try it one more time then, 'cuz I think I got you saying, 'Yes' at the end there.</u>" <b>I, F, R</b></p> <p>Student says "Ahh." Student leans forward and reads, "<u>A group of deer is called a herd.</u>" <b>SR, SE, P</b></p> <p>Teacher clicks on next picture. Student says, "(small gasp) Ahhh."</p> <p>Teacher says, "<u>Hey, check out this picture. This is the one you picked with all the parts. Right?</u>" <b>J, I, P, A</b></p> <p>(student is rocking back and forth two times and focusing on the picture)</p> <p>Student says, "<u>Yes.</u>" <b>SE</b></p> <p>Teacher says, "<u>And you're going to read this part.</u>" (Both are looking towards the screen...student is looking towards the screen at the sentence on the picture.) <b>I</b></p> <p>Student says, "<u>Look at the parts of a deer.</u>" <b>SR, SE</b></p> <p>Teacher says, "<u>Awesome (student). We've got four more slides.</u>" <b>I, J, F, R</b></p> <p>She clicks on the next picture. Student sits forward to mic and reads, "<u>Deer have long legs. They use them to jump high and run fast.</u>" <b>SR, SE, P, C</b></p> <p>Teacher says, "That was awesome, but I hadn't pushed record yet. You gotta watch...and now.." (teacher pushes record button on screen). <b>I, J, F, R</b></p> <p>Student emits little gasp and reads, "<u>Deer have long legs. They use them to jump high and run fast.</u>" <b>SR, SE</b></p> <p>Teacher <u>clicks to next picture.</u> <b>C</b></p> <p>Student reads, "<u>Deer live in forest and fields.</u>" <b>SR, SE, P</b></p> <p>Teacher clicks to next picture. <b>C</b></p> <p>Student reads, "<u>Deer eat almost any plant.</u>" <b>SR, SE, P</b></p> <p>Teacher says, "uh oh...let's read that one again.</p>	
--	--	--	--

		<p>I hadn't clicked record yet."</p> <p>"Ready?" <b>I, F</b></p> <p>Student leans forward, puts mouth on mic.</p> <p>Teacher says, "<b>Not too close.</b>" <b>I, F</b></p> <p>Student reads, "<u>Deer eat almost every plant.</u>"</p> <p><b>SR, SE, RR</b></p> <p>Teacher says, "<u>Now you read, 'Deer eat almost every plant.'</u> But what does that word say?" <b>J, F, I</b></p> <p>Student says, "<u>any.</u>" <b>SR</b></p> <p>Teacher says, "<u>Okay. So let's fix it. We'll read it one more time. You ready?</u>" <b>J, F, I</b></p> <p>Student leans forward but just looks at picture.</p> <p>Teacher says, "<u>Are you ready?</u>" <b>I</b></p> <p>Student says, "<u>Yes.</u>" <b>SE</b></p> <p>Student reads, "<u>Deer eat almost any plant.</u>" (quietly) <b>SR, SE</b></p> <p>Teacher says, "<u>One more time.</u>" <b>J, F, I</b></p> <p>Student reads, "<u>Deer eat almost any plant.</u>"</p> <p><b>RR, SR, SE</b></p> <p>Teacher clicks to next picture and says, "<u>Last one..</u>" <b>F, I</b></p> <p>Student rocks twice back and forth and emits small gasp. Moves mouth towards mic</p> <p>"<u>Look at the fawn's white spots. I love learning about deer.</u>" <b>SR, SE, P</b></p> <p>Teacher (while student is reading says, "oops...oops" (indicating record button is not on). She states, "<u>Let's try that again.</u>" <b>J, F, I, C</b></p> <p>Student reads, "<u>Look at the fawn's white spots. I love learning about deer.</u>" <b>SR, SE, RR</b></p> <p>Teacher says, "Give me five." (student and teacher slap hands together). <b>J, R</b></p> <p>Teacher says, "<u>And you know what I realized? I think I did something wrong on this first one. Let's preview it.</u>" <b>F, J</b> (teacher puts headphone up to her ear to listen on the headphones to the preview).</p> <p>After a few seconds, the student gently pulls on the headphones and says, "<u>You're suppose to hear it..</u>" and looks back at the screen while the photo story is running. <b>SE, J</b></p> <p>Teacher says, "<u>Oh yeah, we gotta redo just this one because you can hear (teacher's name) talking in it. So, let's delete that one. And we'll try it one more time. it's 'All About Deer.'</u> Are</p>	
--	--	--	--

		<p>you ready?" <b>F, I, M, C</b></p> <p>Student sits forward and reads, "<u>All About Deer.</u>" <b>SR, SE, RR</b></p> <p>Teacher says, "<u>Okay!</u>" Now we can preview it. <u>Do you want to put it on (headphones) so you can hear?"</u> (student allows teacher to help put headphones on). <b>I, J</b></p> <p>Teacher clicks on the preview button, says, "<u>You and I can preview it.</u>" <b>J, I</b></p> <p>Student sits holding headphones to his ears, moves forward in his seat to watch the video on the screen. He is smiling (very visibly) and teacher watches student's face while he watches and listens to the story.</p> <p>Teacher says, "<u>Can you hear yourself?"</u> <b>I</b></p> <p>Checks headphones. Student pulls headphones even closer to ears and smiles. Teacher asks again, "<u>Can you hear?"</u> Student smiles and emits a small giggle. <b>J, SE, R+</b></p> <p>Student continues to wiggle (small small wiggles) in the chair as he watches and listens to the story. At the picture of the deer parts, he audible laughs. Sits quietly for the next slides. <b>R+</b></p> <p>Teacher sees story is finished, helps lift headphones off child, and asks, "<u>How was it?"</u>" <b>F,</b></p> <p>Student answers, "<u>Good.</u>" <b>SE</b></p> <p>Teacher: "<u>It sounded good? Let's see what you remember. What is a female deer called? Do you remember?"</u>" <b>I, A</b></p> <p>Student does not answer...still looking at screen.</p> <p>Teacher repeats, "<u>What is a female deer called?"</u>" <b>I, A</b></p> <p>Student responds, "<u>a doe.</u>" <b>SR, J</b></p> <p>Teacher says, "<u>Yeah. Hmmm. What's a baby deer called?"</u>" <b>I</b></p> <p>Student says, "<u>Fawn.</u>" <b>SR</b></p> <p>Teacher says, "<u>That's right! Where do deer live?"</u>" <b>F, J, R, I, A</b></p> <p>Student answers, "<u>In forest and fields.</u>" <b>SR</b></p> <p>Teacher says, "<u>Hmmm, so did you like learning about deer?"</u>" <b>F, I, A</b></p> <p>Student says, "<u>Yes!</u>" <b>SR</b></p> <p>Teacher says, "<u>You did awesome. Way to go.</u>" <b>F, R, J</b></p>	
--	--	---	--

## Sample 2 of Observational Field Notes Case #4

Date	Teacher	Instructional Activities	Initial Codes
August 26, 2015	Case #4	<p>Case #4: Teacher-Student Sessions 2-7</p> <p>Reading the Story</p> <p>Teacher gets the photo story up on the screen. She asks the student to come to the chair and sit. Teacher says, "<u>Let's put the headphones on.</u>" <b>I, C</b></p> <p>Teacher helps student put headphones with mic on over the ears. <b>J</b></p> <p>Student looks to the screen where a photo of his dad and him are standing in front of Niagara Falls (photo from recent family vacation). <b>P, A</b></p> <p>Student sits up.</p> <p>Teacher says, "<u>Okay, say, 'daddy'</u>" <b>I, M</b></p> <p>Students says in a very low and quite voice, "<u>daddy.</u>" <b>SR, SE</b></p> <p>Teacher says, "<u>Okay, let me see.</u>" <b>I</b></p> <p>...and takes headphones to listen to the student's recording. After listening, turns to student and says. "<u>Okay, we've got to do it again. Headphones.</u> (helping put them back on student's ears). <u>Scoot your chair up.</u>" <b>I, F</b></p> <p>Student pulls forward, puts headphones on.</p> <p>Teacher says <u>in a louder voice</u>, "Say, '<u>daddy</u>'." <b>M, I</b></p> <p>Student says in a louder voice, "<u>daddy.</u>" <b>RR, SR, SE</b></p> <p><u>Teacher smiles at student who is looking now at her.</u> <b>J, SE</b></p> <p>The student <u>smiles</u> at the teacher. <b>J, S+</b></p> <p>The Teacher smiles and says, "<u>I think we got it. Let's see!</u>" <b>F, J</b></p> <p>They preview to hear "daddy" on the recording. <b>J</b></p> <p>Student takes a three minute break. <b>S+, R</b></p> <p>Video 1: Teacher gets the photo story up on the screen. She asks the student to come to the chair and sit. He comes right away. <b>S+</b>, Teacher says, "<u>Let's put the headphones on.</u>" <b>I</b></p> <p>Teacher helps student put headphones with</p>	<p>A=Activating Prior Knowledge</p> <p>I=Direct Instruction</p> <p>M=Modeling</p> <p>R=Reinforcement</p> <p>F=Feedback</p> <p>SR=Student responding to instruction</p> <p>SE=Student Engagement (reading)</p> <p>S+ =Student Response Positive</p> <p>S- =Student Response Negative</p> <p>J=Joint Attention</p> <p>RR=Repeated Readings</p> <p>P=Picture Cues/Visual Cues</p> <p>C=Computer Assisted Instruction</p>

		<p>mic on over the ears. <b>J, I, C</b></p> <p><u>Student looks to the screen</u> where a <u>photo</u> of his mom and him are standing in front of Niagara Falls (photo from recent family vacation). Student sits up. <b>A, SE, P, S+</b></p> <p>Teacher says, "<u>Okay, say, 'mommy'</u>" <b>M, I</b></p> <p>Students says in a very low and quite voice, "<u>Mommy.</u>" <b>SE, SR</b></p> <p>Teacher says, "<u>Okay, let me see.</u>" <b>F...</b>and takes headphones to listen to the student's recording. After listening, turns to student and says. "<u>Okay, we've got to do it again. (points to headphones for student cue to put them on)</u> <u>Headphones.</u> (helping put them back on student's ears). <u>Scoot your chair up.</u>" <b>I, F, M</b></p> <p>Student pulls forward, puts headphones on. Teacher says in a louder voice, "<u>Say, 'mommy'.</u>" <b>M, I</b></p> <p>Student says in a louder voice, "<u>Mommy.</u>" <b>SE, SR, RR, S+</b></p> <p>Teacher <u>smiles at student</u> who is looking now at her. Teacher smiles, lifts up her hands with and says, "<u>I think we got it. Let's see!</u>" They preview to hear "Mommy" on the recording. <b>J, F, R</b></p> <p>Student takes a three minute break. <b>R</b></p> <p>Video 2: Student is directed back to the chair and computer. He comes right away. <b>S+, I</b></p> <p>Teacher hands the headphones to the student and he puts them on. He looks at her and then at the picture on the screen. The teacher says, "<u>Our next word is 'water'.</u>" <b>I, M, P, A</b></p> <p>Student is looking at the picture on the screen and says, "<u>Water.</u>" <b>SE, SR, C</b></p> <p>Teacher previews to hear--student and teacher smile together when they hear "water." <b>SE, J</b></p> <p>Student takes a break. <b>R</b></p> <p>Video 3: Student is directed back to the chair and computer. He comes right away. <b>S+, I</b></p> <p>Teacher hands the headphones to the student and says, "<u>Okay, get them back on there!</u>".. and he puts them on. The teacher says, "<u>Our next word is 'computer'.</u>" <b>I, M, C, A</b></p> <p>Student is looking at the screen...the picture of himself at the computer with the word</p>	
--	--	---	--

		<p>'computer' written across the top. <b>P, A</b>  Student puts fingers into his mouth and plays with the mic. He whispers, "<u>computer</u>." <b>SE, SR</b>  The teacher says in a calm voice, "<u>we gotta do it again. You can't whisper. You gotta say it loud!</u>" <u>Get your fingers out of your mouth. Okay, say 'computer'.</u>" <b>I, M</b>  She moves to physically help student remove fingers from his mouth and readjust the mic.  Student says, "<u>Computer</u>." <b>SE, SR, RR, P</b>  Teacher says, "<u>Alright, let me hear it</u>" (student hands headphones to teacher). <b>I</b>  Teacher says, "<u>My turn</u>" as she places headphones on her ears and says, "<u>Good job.</u>" <b>J, F, R</b>  Student takes a break. <b>R</b></p> <p>Video 4: Teacher call student back to computer. He comes right away. <b>S+</b>,  After listening to the word. The teacher decides to ask the student to record again.  "<u>Okay, say it one more time. I know you can say 'computer'.</u>" <b>I, F, M, C, A</b>  Student says, "Computer." (a little soft and muffled) <b>SE, SR, RR, P</b>  Teacher says, "<u>Good job, say it one more time. Say 'Computer'.</u>" She points to the student.  Student doesn't say anything. Teacher resets audio recording.  Teacher says, "<u>Alright you have to say it. Say 'computer'.</u>" <b>I, F, M</b>  Student whispers, "<u>computer</u>." <b>SR, SE, RR, P</b>  Teacher says, "<u>You can't whisper. say</u>"...(student starts to remove headphones, teacher says, "<u>Put them on</u>" (and student puts headphones back on). <u>Teacher says, "Say 'computer'.</u>" <b>I, F, M</b>  Student says, "<u>computer</u>." (a little louder). <b>SR, SE, RR, P, S+</b>  Teacher says, "<u>Okay. Let me hear. You're doing awesome.</u>"  Student hands headphones to her and she listens to the recording. <b>J, F, R</b>  Student takes a break. <b>R</b></p> <p>Video 5: Teacher call student back to</p>	
--	--	--	--

		<p>computer. He comes right away. <b>S+</b>, Student sits in the chair and looks at the screen. Teacher has the picture of the student with some stuffed animals. She points to the picture and asks the student, "<u>Who is that?</u>" She <u>waits...no response from student. He continues to look at the picture.</u> Teacher asks, "<u>Is that (student's name)?</u>" <b>J, A</b></p> <p>He laughs and moves forward and back in the chair. <b>J, S+, P</b></p> <p>Teacher hands headphones to the child and says, "<u>Okay, put them on. Say 'animals'.</u>" <b>I, M</b></p> <p>Student whispers, "<u>Animals.</u>" <b>SE, SR, P, C</b></p> <p>Teacher deletes audio and says, "<u>Say, 'animal'.</u>" <b>I, M, F, C</b></p> <p>Student whispers, "<u>Animals.</u>" He takes his headphones off and holds them. <b>SE, SR, S-</b></p> <p>Teacher deletes audio and says, "<u>Hey wait, put your hands in your lap. Put your headphones on.</u>" (student puts headphones on holds his hands to his mouth). <b>I, F</b></p> <p>Teacher says, "<u>Hands in your lap. Hands in your lap.</u>" (student puts his hands in his lap). <b>I, F</b></p> <p>Teacher says, "<u>Good job.</u>" <b>F, R</b></p> <p><u>Student starts to put hands back up S-....</u></p> <p>Teacher says, "<u>Nope! Say 'animals'.</u>" <b>F, I, M</b></p> <p>Student says, "<u>animals.</u>" <b>SE, SR, P</b></p> <p>Teacher says, "<u>Can I hear it?</u>" <b>I, F</b></p> <p>Student hands headphones back to teacher.</p> <p>Teacher <u>smiles as she listens to the headphone.</u> <b>F, J</b></p> <p><u>Student is laughing and smiling.</u> <b>S+, J</b></p> <p>Student takes a break. <b>R</b></p> <p>Video 6: <u>Teacher calls student back to computer. Teacher hands headphones to student and he puts them on.</u> <b>I</b></p> <p><u>Student sits in the chair and looks at the screen</u> (a picture of the student in a swing with the word swing is written across the bottom). <b>P</b></p> <p>Teacher points to the picture and says, "<u>What's that? (pauses) Swing. I know you can say this word. Say swing.</u>" <b>I, M, P, C, A</b></p> <p>Student says, "<u>Swing.</u>"</p> <p>Teacher says, "Okay, one more time. Say 'swing'." <b>SR, SE, P, A</b></p>	
--	--	--	--

		<p>Student taps the desk the computer is on.  Teachers says, "<u>Hands in your lap. Hands in your lap.</u>" <b>I, F</b>  Student puts one hand down. Teacher says, "<u>This one, too</u>" (pointing to other hand). <b>I, F</b>  Student puts hand down. Teacher says, "<u>Good job. Say 'swing'.</u>" <b>F, I, R</b>  Student says, "<u>Swing.</u>" <b>SR, SE, P</b>  Teacher records then erases (word was muffled). <u>Teacher and student are smiling at each other.</u> <b>J</b>  Teacher says "<u>Say, 'swing'.</u>" <b>I, M</b>  Student whispers, "<u>swing.</u>" <b>SR, SE, RR, P</b>  Teacher says, "<u>You can't whisper it. Say it loud. Say 'swing'.</u>" <b>I, M, F</b>  Student says louder, "<u>swing.</u>" <b>SR, SE, RR, P, S+</b>  Teacher says, "<u>Okay! Give me the headphones. Let's see if we got it! Good job.</u>"  Teacher listens to the recording. She decides to record again. Teacher gives headphones back to the student who puts them on. Teacher says, "<u>Hands in your lap.</u>" <b>F, I</b>  Teacher folds her hands and puts them into her lap. <b>M</b> The <u>student puts his hands down.</u> <b>S+, J</b>  Student puts hands on his mouth. <b>S-</b>  Teacher says, "<u>Hands in your lap.</u>" <b>I</b> (student puts hands in lap) Teacher says, "<u>Good job. You're gonna say, 'swing'.</u>" <b>F, I, M</b>  Student says, "<u>swing.</u>" <b>SR, SE, RR, P, S+</b></p> <p>Teacher says, "<u>That was good. That was loud!</u>" <b>F, R</b>  Student <u>hands headphones to teacher.</u> <b>S+</b>  Teacher listens to recording.  Student takes a break. <b>R</b></p> <p>Video #6.  <u>Teacher calls student back to computer. He comes right away.</u> <b>S+, I</b>  Teacher hands headphones to student and he puts them on. Teacher points to the picture on the screen. She says, "<u>What is that. That says music. 'Music. Music'.</u>" <b>I, M, P, A, C</b>  Student taps his feet on the floor and put hands on his mouth. Teacher says, "<u>Alright, hands in</u></p>	
--	--	---	--

		<p><u>your lap."</u> <b>I</b>  Student puts hands in his lap and taps his feet on the floor. <b>S+</b>  Teacher touches student's knees and says, "<u>Alright. Feet still. Say, 'music'.</u>" <b>F, M, P</b>  Student says in a low muffled voice, "<u>music.</u>" <b>SR, SE, RR, P, S+</b></p> <p>Teacher deletes audio. Teacher says, "<u>Alright, one more time, (touches student's hands to put away from the mouth) say, 'music'.</u>" <b>I, M, P</b>  Student says, "<u>music.</u>" <b>SR, SE, RR, P</b>  Teacher says, "<u>Alright, can I hear it?</u>" (student hands the headphones to her) <b>S+ , SE</b>  Teacher says, "<u>Thank you.</u>" <b>F</b>  Student takes a break. <b>R</b></p> <p>Video #7.  Teacher call student back to computer. He comes right away. <b>S+, I</b>  Teacher hands headphones to student and says, "<u>Put your headphones on"- and he puts them on.</u> <b>S+, C, A</b>  Teacher <u>points to the words 'The End'</u> on the picture on the screen Teacher says, "<u>You're going to say, 'The End'.</u>" <b>I, M, P</b>  Student says, "<u>The End.</u>" <b>SR, SE, P, S+</b>  Teacher was not recording.  Teacher says, "<u>Okay, one more time.</u>" <b>I</b>  Student says, "<u>The End.</u>" <b>SR, SE, RR, P, S+</b>  Has hands in his mouth. <b>S-</b>  Teacher says, "<u>Hands out of our mouth.</u>" <b>I</b>  Student <u>takes hands out of his</u> mouth. <b>S+</b>  Teacher says, "<u>Say, 'The End'.</u>" <b>I, M</b>  Student says, "<u>The End.</u>" <b>SR, SE, RR, P, S+</b>  Teacher says, "<u>Can I hear it?</u>" (student hands the headphones to her). Teacher says, "Thank you." <b>J, F, I</b>  Student takes a break. <b>R</b></p>	
--	--	--	--

## Appendix K

### Letter to Participant

## Letter to Participant

Date: \_\_\_\_\_

Dear \_\_\_\_\_ ,

Thank you for being a participant in my dissertation study, "Teacher perceptions of the Impact of Digital Photo Stories on Students with Autism Spectrum Disorders." In order to strengthen the reliability and validity of my study, I would like to give you the opportunity to review my transcripts and notes to ensure that my perceptions of the transcribed interviews and observation events are accurate.

If you would like to make any changes, suggestions, or have any questions or concerns, please return the attachment with notations or contact me via email at [jconn@gardner-webb.edu](mailto:jconn@gardner-webb.edu). I would like to discuss any incorrect conclusions to ensure the transcripts are accurate representations of the interviews and observations. I will make contact within five days for your acknowledgment of the status of the transcripts.

Thank you for your participation with this study. I truly could not have completed this study without your cooperation.

Sincerely,

Julie J. Conn