

An Exploration of Using iPads and Digital Storytelling through weStories
with Students who have Autism

by

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ABSTRACT

This study investigated the potential of using weStories, a type of digital storytelling, and the use of iPads with second and third grade students who have autism. Autism Spectrum Disorder (ASD) is a neurological disorder that affects a person's ability to communicate, comprehend language, and their ability to socially interact with peers.

Digital storytelling combines the art of telling stories with photos, videos, audio, and other digital media. This study employed the use of weStories, a collaborative storytelling process that requires students to work in a team while using an iPad. weStories were created by Dr. Glenda Gunter specifically for individuals to learn the fundamental of narrative and story skills to increase their literacy and communication skills.

This study was conducted over a series of teachings and observations at the United Cerebral Palsy of Central Florida (UCP). The UCP is a school that serves children with a variety of learning disabilities, including autism. The purpose of this ethnographic thesis was to explore the impact of teaching the story invention process and weStories through iPads with students who have autism. Ethnographic research design was utilized to observe and assess individual changes in student behaviors and investigate the phenomena of story. This study utilized qualitative research methods. The potential of the intervention was measured through interviews and observations.

This research on using technologies with students who have autism, such as iPads and weStories, has shown potential in terms of working collaboratively; enhancing problem solving in social situations, and providing exposure to iPads as a learning tool.

DEDICATIONS

This thesis is dedicated to my loving parents, Mario and Joyce Mariotti. Without their constant support, encouragement, and love I would not be where I am today. I am so thankful to have such amazing parents and role models in my life.

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CHAPTER ONE: INTRODUCTION

Communication and social interactions are important characteristics that make humans distinctly unique from all other species on Earth. Humans rely tremendously on the connections that they make with each other. Connecting through communicating with others adds to the quality of life and makes life more complete.

When a person has autism, this can significantly hinder their ability to build these social connections that humans strive for to live a fulfilling life (Tonge & Brereton, 2010). Meaningful relationships are one of the greatest joys of life and autism often prevents people from having these relationships. One form of aiding the communication process is by using digital storytelling as a tool. Digital storytelling has been proven to help children who are typically developing, and with learning disabilities to build social connections and increase social skills (Gunter & Kenny, 2011). This study was a significant endeavor in assessing the potential of using weStories, a type of technological storytelling intervention, and iPads with students who have autism. If weStories and iPads have the potential as a learning tool for students with autism, then the notion of using weStories should be further explored.

The purpose of this study was to explore the potential of using storytelling through an intervention called, weStories on an iPad with students who have autism. weStories are a unique form of using the story invention process that assist in teaching students the power of story while working on literacy skills, like reading, writing, communicating, and creating visual representations. This study employed the use of the story invention process of weStories developed by Gunter and Kenny to create digital storytelling skills to increase students'

communication skills (2008). weStories are a branch of the already researched and successful intervention developed by Gunter and Kenny (2008), meStory, and was employed for the first time in this study. weStories use the same concepts as meStories, except stories are created in teams. weStories require two or more students to work in a group to write and create their own story through the use of technologies such as an iPad. Data was collected and analyzed through observations while the students worked together to create their weStories. By observing students at the United Cerebral Palsy of Central Florida (UCP), this study analyzed the advantages and disadvantages of using weStories, iPads, and the story invention process on students who have autism. The goal of this study was to assess the potential of implementing weStories and iPads on students with autism. By observing the behaviors that students with autism display while creating weStories and using an iPad, the potential was assessed.

The following research question was used to collect data and guide the research:

1. What are the behaviors demonstrated by students with autism using iPads to create weStories?

The purpose of this thesis was to explore the impact of teaching the story invention process and weStories through iPads with students who have autism. With the number of children who are diagnosed with autism increasing every year, it is imperative to find ways to aid these children in learning communication skills and find ways to motivate them to interact and build connections with their peers. Using technology as a learning tool has gained popularity in the education field over the past decade and has increasingly gained recognition as an outstanding medium in which to teach children with learning disabilities. This study used an

ethnographic methodology approach to examine the potential of using iPads with students who have autism.

CHAPTER TWO: LITERATURE REVIEW

This literature review will begin with a broad overview of learning disabilities and move into descriptions of autism. Following these areas of interest, this literature review will examine the benefits of storytelling on learning, and incorporation of technologies such as weStories and iPads to aid in the storytelling process.

Learning Disabilities

Learning disabilities is a broad term that encompasses a variety of more specific disabilities. According to the National Institute of Neurological Disorders and Stroke 2011, a learning disability is characterized by difficulty understanding or using spoken and written language, performing mathematical calculations, coordinating movements and/or directing attention. In the United States about 5% of school aged children are classified as having a learning disability (Kail & Cavanaugh, 2010). Children can either have difficulty with motor learning and coordination or, more commonly, have difficulty learning and using symbols. The children who have difficulty learning and using symbols are said to have a language-learning disability. Six categories that learning disabilities can fall into are motor, attention, perception, memory, and emotion (Owens, Metz, & Haas, 2007). Children may have one or more of these characteristics in varying combinations, but few students have all of them. Children who have motor difficulties are classified as hyperactive or hypoactive. Hyperactivity is characterized by difficulty concentrating and is more common, especially in boys. A short attention span, inattentiveness, and distractibility are attention difficulties. Attention deficit hyperactivity disorder (ADHD) is a well-known learning disability, characterized by children who have

hyperactivity and attention difficulties, but who do not manifest other characteristics of learning disabilities (Owens, Metz, & Haas, 2007). Children who have perceptual disabilities have trouble distinguishing between similar sounds, words, and printed letters (Owens, Metz, & Haas, 2007) . They also have trouble integrating information from different senses, for example vision and hearing. According to the National Joint Committee on Learning Disabilities, Dyslexia is a language-based disability in which a person has trouble understanding written words, and Dysgraphia is a writing disability in which a person has difficulty producing written symbols.

Problems with recall can affect short-term memory retrievals, and children will also show word-finding problems. Children with a learning disability can also display emotional problems that may be rooted in the fact that they are constantly being told that they are not trying hard enough, give up to easily, are not paying attention, and much more (Owens, Metz, & Haas, 2007). Although children with learning disabilities typically perform lower on language tests, they do not always have lower IQ's than their peers. Children with learning disabilities can in fact have higher IQ's than their peers. All of these factors can be frustrating and manifest into outbursts of emotions and actions that can be described as aggressive, impulsive, unpredictable, and withdrawn (Owens, Metz, & Haas, 2007).

Many times children's learning disabilities are not detected until they start to attend school. Mainly because as educators start the process of teaching their students they see issues rising in the learning process that are not usually detected by parents. Children with learning disabilities may in times develop skills to hide their disabilities and they may become experts in how to compensate for their disability by using another area to learn that they are stronger in, which can cause the disability to go unidentified for years (Owens, Metz, & Haas, 2007). Some

children will outgrow their learning disability; hyperactivity may fade with adolescence. Yet, many will struggle with their disability their whole lives (Owens, Metz, & Haas, 2007).

Usually children with language-learning disabilities show deficits in all area of language: reading, writing, listening, and speaking (Owens, Metz, & Haas, 2007). These children have difficulties with the interchange and interaction of conversation, form, content, and rules of language. As a result overall oral language development may be slow (Owens, Metz, & Haas, 2007). Some children with learning disabilities might even come across as dysfluent, easily mistaken for stuttering, children with learning disabilities display a behavior called cluttering. According to Owens, Metz, and Haas (2007) cluttering is dysfluent speech that is characterized by overuse of fillers and circumlocutions associated with word-finding difficulties, rapid speech and word and phrase repetitions. There may be hesitations that make speech difficult to understand and these students may be seen as abnormal. The difference between stuttering and cluttering is that cluttering does not show signs of fear of words the way stuttering does.

Autism

Owens, Metz, and Haas (2007) characterized disorders of childhood that are characterized by atypical behaviors and severe impairment in the ability to relate to others as pervasive developmental disabilities (PDD). Autism spectrum disorder is an example of a pervasive developmental disability. Autism spectrum disorder is a neurological disorder that affects a person's ability to communicate, comprehend language, and their ability to socially interact with peers (Autism 101). For a more detailed definition of autism the definition from the Centers for Disease Control and Prevention is provided (see Appendix B). According to Bruce Tonge and Avril Brereton 2010, three core impairment features of autism exist. These

characteristics are communication, social interaction, and repetitive behaviors. Children with autism have a limited or impaired ability to relate to others. They display little to no interest in other people, usually show no variation in facial expression and have trouble maintaining eye contact. Children with autism never seem to develop empathy or the awareness that others have feelings.

Since autism is a spectrum disorder, children diagnosed with autism can fall anywhere on the spectrum, ranging from less severe syndromes, for example Asperger's syndrome, to children with severe autism, such as Rett's Syndrome. Powell-Smith and Sansosti (2008) stated "Across the spectrum, characteristics of the disability manifest uniquely as a collection of symptoms that are rarely the same from one individual to another" (p. 162). At one end of the spectrum are individuals who have profound cognitive impairments and speech delays; these individuals are referred to as low functioning. At the other end of the spectrum there are individuals who have mid to low cognitive abilities and less severe language deficits (Powell-Smith & Sansosti, 2008). Therefore, each individual with autism can have very different characteristics from the next person.

Asperger's Syndrome is defined as a mild form of PDD characterized by normal intelligence and typical language development with deficits in social and communication skills (Owens, Metz, & Haas, 2007). Children with Asperger's Syndrome are not always isolated and secluded. They can be passive and not show interest in relating to or playing with other children, however, other children can be very intrusive, come too close, and ask inappropriate questions (Barnhill, 2001). They have trouble understanding pragmatics, or the social rules of society.

Barnhill (2001) felt, “The key problem is not that they are socially isolated but that they cannot change their behavior to the environmental demands” (p.261).

Children with Asperger’s Syndrome have communication impairments in verbal and nonverbal communication. These children are able to speak and use language but do not use it in a socially acceptable “normal” standard. Sometimes children with Asperger’s will be called “little professor” because they use intellectual and educated speech. They can get caught up speaking about things they are interested in, but may not be able to hold a conversation on how their day is going (Barnhill, 2001). These individual also have trouble understanding literal and implied meanings. Their nonverbal communication abnormalities are also evident in their social interactions. Gena Barnhill (2001) listed some of their nonverbal deficits as: limited use of gestures, awkward body language and limited facial expressions. Individuals with Asperger’s Syndrome have extreme difficulty in social situations because they have trouble interpreting other’s body language and facial expressions and struggle to use their own body language and facial expressions in a proper fashion.

The prevalence of autism is increasing every year. “About 1 in 88 children have been identified with an autism spectrum disorder (ASD) according to estimates from CDC's Autism and Developmental Disabilities Monitoring (ADDM) Network” (2012). Autism spectrum disorder is more common among males than females. While the direct cause of autism is unknown, it has appeared to run in families; however there has not been a gene linked to autism. Currently no known cure for autism exists; however, through early intervention, special education, and family support people with autism can lead a fulfilling life (Del Valle, 2001).

Educators and clinicians have used various interventions with children with autism to aide their learning, communication, and social skills.

Using Technology as a Learning Tool

Technologies have been used for many years in the education process, however, in the last few years many technologies have been revolutionized to be more useful in learning, interactive, and further enhance communication and learning process (Shelly, Gunter, & Gunter, 2012) “At the basic level, we know that computers help students improve their performance on basic skills tests, and is a powerful tool for problem solving, conceptual development and critical thinking” (Educational Technology). Students enjoy learning when the process is more hands on and interactive, technology allows learning to be interactive (Shelly, Gunter, & Gunter, 2012). Studies have shown that student’s attitude towards learning becomes positive when technology is integrated into the lesson. Using computers as an aid to education has shown to cause students to learn quicker and retain the information longer (Gunter & Kenny, 2012).

A technological device that has come to the forefront of the education field recently is iPads. In recent years iPads have been receiving a lot of attention as a tool for educating children with autism. Multiple news reports are been made about the benefits that iPads can provide for children who struggle to learn and communicate in traditional ways. “60 Minutes” on CBS ran a special on October 23, 2011 titled “Studying Autism and iPads” in which they interviewed several people with autism, their parents and teachers in order to investigate the effect that the iPad has had on their communication and learning abilities.

Various apps are being created to help communication and social skills of individuals with autism. One example of an app that helps develop social skills is “Hanging Out”. “The

“Hanging Out” App explains how to invite a friend out and provides suggestions on what to do when out with friends” (Ferrell, 2011). Individuals on the autism spectrum have trouble with social interaction and relating to their peers. This app aims to help develop those skills.

Individuals who have been diagnosed with autism and their families have been coming forward in support of the iPad as an important resource for people on the spectrum. Tammy Swift reported on a child named Cade who showed significant improvements from using an iPad. Cade was diagnosed with autism at 20 months of age. Now Cade is using the app Proloque2go for the iPad to communicate. According to the article, Cade has become much more verbal, he is trying to say words that he could only sign before (Swift, 2011). Cade’s mother states that he is more motivated and eager to learn since using the iPad. Swift says that the iPad has helped to bridge the gap between Cade and his peers because he is now seen as “pretty cool” since he can bring his iPad with him to school (Swift, 2011).

There are many advantages of an iPad as a learning tool for children with autism. Swift (2011) states “the tablet’s intuitive design, quick learning curve, versatility and portability have made it appealing to children with autism and the people who teach them” (p.1). One of the main advantages is the relatively affordable price of the iPad when compared to other technology devices that have been designed for autism (Swift, 2011). An iPad cost about \$500 and other devices can cost up to \$15,000 (Swift, 2011). Costs of having a child with special needs can add up fast and it’s nice that families have a more affordable option for their children.

Beyond the cost, iPads have characteristics that are very appealing to the learning style of children with autism. Images and visuals tend to stimulate children with autism more than words;

the iPad provides a mixture of audio and visual cues that engage the child's learning (Swift, 2011). Overall, using an iPad is interactive, and can turn learning into something fun.

Storytelling

The acquisition of narrative skills is a language development milestone that is vital to the success of a child's literacy and communication skills (Pence & Justice, 2007). A child's spoken or written account of a factual or fictional event from the past, present, or future is known as a narrative. Narratives are a very complex form of communication that requires a child to introduce a topic and organize the information so that the listener has a relatively passive role in understanding the information presented (Pence & Justice, 2007). Children must use their knowledge of syntax, morphology, vocabulary, and pragmatics to share an appropriate amount of information with the listener.

Reading a story out loud to a group of young children helps them learn language. They are being exposed to vocabulary, sentence types, and comprehension. Isbell, Sobol, Lindauer, and Lowrance (2004) stated, "Children who are frequently exposed to storybook reading are more likely to use complex sentences, have increased literal and inferential comprehension skills, gain greater story concept development, increase letter and symbol recognition, and develop positive attitude about reading" (p.158). Storytelling involves a more imaginative and creative process, when compared to storybook reading, that are key benefits to having a child tell a story. When reading a story, the main communication is the text on the page. When telling a story the words are not memorized, they are recreated through "spontaneous, energetic performances, assisted by audience participation" (Isbell, Sobol, Lindauer, & Lowrance, 2004). Due to the

audience participation storytelling is a form of two-way communication. Storytelling also gives the opportunity for listening skills to develop. The children who are the audience must learn to sit and listen quietly to the speaker's story.

When teachers present a storytelling assignment to their students they are not only providing the opportunity to write a story, but to tell their story (Thesen & Kara-Soteriou, 2011). To young students, this sounds more exciting and engaging, which causes them to be more motivated about the assignment. Ashley Thesen (2011) shares her own experience using storytelling in her classroom in her article "Using digital storytelling to unlock student potential" stating "my students become more motivated and are dedicated to writing their story and exploring the sharing of it through different modes and venues" (p. 93). Storytelling allows the students to get creative and share a narrative that they authored. According to Dillingham (2005), "when students know they are publishing their writing for an audience instead of just for the teacher, their motivation increases and they produce higher work" (p. 75).

Thesen and Kara-Soteriou (2011) state that "storytelling has the potential to inspire and develop imagination and oral fluency, encourage visualization, improve public speaking skills, enhance listening skills, and, ultimately, inspire students to write" (p.93). The positive effects that storytelling can have on learning have been demonstrated for centuries. Storytelling enhances learning in children. Matthews-DeNatale (2008) stated, "Storytelling and learning are intimately intertwined because the process of composing a story is also a process of meaning-making" (p. 2). Storytelling requires that students think about what they know, assess their own assumptions, and revise their thinking. This process leads to a very valuable learning experience

that can help increase critical thinking skills, creative writing skills, communication skills, and vocabulary.

Teachers are always trying to be innovative and come up with new ways to inspire children to learn. Educators have begun to take advantage of the growing use of technology in education, and have put a modern spin on classic storytelling techniques. They have begun to use digital storytelling. Digital narratives bring the importance of narrative skills and the 21st century's use of technology together, to form an enjoyable and productive learning experience for children.

The Digital Storytelling Association defines Digital Storytelling as "the modern expression of the ancient art of storytelling. Throughout history, storytelling has been used to share knowledge, wisdom, and values. Over time the telling of stories has taken many different forms. Stories have been adapted to each successive medium that has emerged, from the circle of the campfire to the silver screen, and now the computer screen" (¶1)

Joe Lambert, the founder of the Center for Digital Storytelling (2010) defines digital storytelling as "A short, first person video-narrative created by combining recorded voice, still and moving images, and music or other sounds" (p.9). He identified seven steps of digital storytelling. The first three steps are meant for self-reflection and becoming aware of the message one is trying to convey through their story. These steps are: owning your insights, owning your emotions, and finding the moment. In the fourth step, which he labels "Seeing Your Story," the storytellers should identify what images come to mind when they are thinking of their story. This step captures the use of images, visuals, and technology. When they have the images

in their mind, they are to explore what these images mean (Lambert, 2010). After the images and visuals have been collected the fifth step in Lamberts model is “Hearing Your Story”. By now the emotional tone of the story has been identified. The storyteller can now add voice over, music, and sound to their story (Lambert, 2010). In the sixth step, “Assembling Your Story,” all the elements of the story come together to form the complete digital story. Then in the final step, “Sharing Your Story” the storyteller gets the opportunity to share their digital story by presenting it to teacher, peers, and classmates.

Digital Storytelling combines the art of telling stories with photos, videos, audio, and other digital media (Gunter & Kenny, 2011). Digital storytelling focuses on a chosen theme. The stories can be about a variety of different subjects including personal stories, historical events, or to inform and instruct a topic (Gunter & Kenny, 2011). Personal narratives are accounts of a significant incidence in one’s life (Robin, 2011). According to Bernard Robin (2011): seven elements of digital storytelling are: 1) point of view, 2) A dramatic question, 3) emotional content, 4) The gift of your voice, 5) The power of the soundtrack, 6) Economy of words, and 7) Pacing (Robin, p. 2).

This study employed the use of the story invention process of weStories developed by Gunter and Kenny to develop digital storytelling skills to increase students’ communication skills (2008). weStories are a branch of the already researched and tested (Gunter & Kenny, 2011), meStories, and were employed for the first time in this study. Originally, meStories were created specifically for individuals to learn the fundamental of narrative and story skills to increase their literacy and communication skills. meStories focused on using narrative epistemology, interactive participatory learning, visual learning techniques, and the use of digital

technologies to help individuals improve on their social and communication skills (Gunter & Kenny, 2011, 2012). The meStories methodology has been successfully implemented in classroom of students with varying abilities and has shown great potential to assist in learning (Gunter & Kenny, 2011, 2012).

Similar to meStories, weStories use the same concepts except the stories are created in teams using *Story Patch* through iPads. The children work with one or more other students, with or without disabilities, to create weStories. This method is very appealing to study the communication patterns of children with autism and their typically developing peers. This intervention was used to assist students with Autism Spectrum Disorder in increasing and improving their behavioral and communication skills.

Autism and Story

Individuals with Autism Spectrum Disorder struggle with deducing, predicting, and understanding their environment so that modifications and communication even in well-known environments can be exceptionally taxing for them (Daigle, 2008). Thus, the use of visuals, for example picture/word story can have great influence in helping these individuals move from one activity or task to another without getting distraught. The research conducted by Carol Gray has shown that using story, narrative, and other story techniques can have a positive influence on verbal communication and other forms of behavioral issues (Gray & Garand, 1993). Carol Gray developed the Social Stories and Comic Strip Conversations in 1991 to provide individuals with Autism Spectrum Disorder social skills training to meet their precise social needs and insufficiencies. The Social Story and Comic Strip Conversations are an effective way to teach individuals with autism social and problem solving skills to put to use in social setting through

story. The individuals do this through writing a story or drawing a comic strip that is specific to them and their confusing social situation. This helps the individuals create stories and helps them use the information delivered in the stories to their own lives (Gray & Garand, 1993).

Summary

A brief overview of learning disabilities and autism was provided. As well as a look at the benefits that storytelling and technology can have on learning in children with and without disabilities. In the next section, the methodology for this thesis will be explained. Including a description of the participants, location, and ethnographic research.

CHAPTER THREE: METHODOLOGY

This study used ethnographic research that utilizes qualitative data analysis to interpret the potential of using the weStories intervention and iPads with students who have autism.

Design

Ethnographic research provides thoroughly detailed observations of the individuals involved in the study. This type of research will often provide a basis for future research in its area. Ethnographic research gathers qualitative data through observations and interviews with the participants, and all parties involved in the study (O' Reilly, 2005). Ethnography investigation utilizes qualitative research methods aimed to learn and understand social and cultural phenomena, which can provide knowledge to develop meanings for guidance and analysis. Data is collected in a naturalistic setting, and the researcher “lives” among the participants in order to collect detailed observations.

This study was conducted over five, 45 minute, lessons of teaching second and third grade students the techniques of using story creation, with weStories and iPads. During these lessons, the researcher conducted a series of open-ended observations of student communication, social, and behavioral patterns. The teacher provided her observations during the study as well and an interview was conducted of the students before the study began.

Population and Sample

The population for this study was second and third grade students who were attending the United Cerebral Palsy of Central Florida (UCP). The UCP serves children with a variety of learning disabilities and disorders, including cerebral palsy, autism, and Down syndrome. The

UCP practices inclusion, therefore children with disabilities and typically developing children are taught in the same classrooms, all day. Six students were selected to participate in this study. The students were selected based on teacher recommendation. The student's cognitive, intellectual, and social abilities were all considered when selected for participation in this study.

The sample consisted of four-second grade students and two third grade students. Four males and two females participated in this study. Two of the children were typically developing, on grade level students, three of the children are diagnosed with Autism Spectrum Disorder, and one child had cerebral palsy and a learning disability.

- (1) Student one (S1) is in the second grade. He has autism, communication and social difficulties, and attention deficits.
- (2) Student two (S2) is in the second grade. He has cerebral palsy, a learning disability, and attention deficits.
- (3) Student three (S3) is in the second grade. He has autism and is frustrated easily.
- (4) Student four (S4) is in the second grade and has autism, attention deficits, and social difficulties.
- (5) Student five (S5) is in the third grade, and is a typically developing female.
- (6) Student six (S6) is in the third grade, and is a typically developing female.

These students were selected through teacher recommendation based on their cognitive, intellectual, and social abilities. The students who participated in this study are all in the same reading group; therefore, are all on similar reading levels. Data from S4 and S5 were analyzed and interpreted for the purpose of this thesis.

Instrumentation

After IRB approval (see Appendix A), the students were brought in a classroom at the UCP and asked interview questions that helped to determine their knowledge on story and create a baseline measure. The questions asked were:

- (1) Do you like to hear stories?
- (2) Do you like to tell stories?
- (3) What is your favorite kind of story? Why?
- (4) How do you feel when you hear a scary story?
- (5) What would you do if your friend starting crying about the story?
- (6) If you were a character in a story, what character would you be?

The researcher conducted a series of observations of the students social, communication, and behavioral habits and abilities before and during the intervention. The following subsections will provide an outline of the intervention by day. The student's teacher provided her observation of the study and her students reactions to weStories and using iPads.

Data Collection

The effectiveness of storytelling, through weStories with students with autism, was measured through participant observations conducted by the researcher and the classroom teacher, and interviews with the students who participated in the study. Participant observations were done in the naturalistic setting of the classrooms at the UCP. In-depth interviews included open-ended questions that were asked of each student who participated in this study in order to gain insight on their previous knowledge of storytelling.

On day one a field test was conducted in which a baseline was established. Students were introduced to the researcher and had a chance to become familiar with an iPad. Data was collected through observations on how each child interacts with each other and how they handled using the iPads for the first time. The iPad apps that were used aided the researcher to begin studying student's technical, communication, and cooperative learning skills. The purpose of this initial day was also to create a cohesive atmosphere between the researcher and students. The apps used were *Butterfly Math*, *Simple Math*, and *Kid Math*. Each child worked with a coach on the iPad and worked with the researcher as a mentor on interactive math problems.

On day two the in-depth interview questions were asked of each student. An app for the iPad called *Story Patch* was introduced to the students. *Story Patch* was used as a medium for the students to create their weStories. Project Autism, a website devoted to education for autism lists *Story Patch* as an effective app for teaching children with autism. *Story Patch* aids children in telling a story through providing prompts and clip art for the children to use to create their own story. The students were given the opportunity to become familiar with *Story Patch* and how it works. The app provides story prompts and graphic clip arts.

On day three students were paired in groups of two and each group was provided with an adult mentor to assist them and teach the story invention process. Each group was given their own iPad with the *Story Patch* app downloaded on it. Students were given prompts on creating storyboards and the different parts needed to create a story, story invention, and other story specifics. Students were taught to develop a problem and to think of a solution to their problem.

On day four, the story invention process continued. Students continued working with their previous partners and mentors. The students continued to develop their story and work on a

solution to their problem. Graphics were added to their stories with help from the researcher, including some photos of them that were taken directly on the iPad and uploaded to the app.

Day five started with a brief discussion with the students about how they felt about the intervention and how they liked working with iPads. The students began working on a new story with the same partner. They used story prompts from the *Story Patch* app to create another narrative.

Summary

This study was conducted at the UCP and involved six students who were attending the school at the time. Ethnographic research was conducted through observation and interviews in the naturalistic setting at the UCP. This study was implemented over five days for 45 minutes a day. The next section provides detailed descriptions of the observations that occurred on each of the days.

CHAPTER FOUR: FINDINGS

The purpose of this study was to explore the potential of using weStories and iPads with students who have autism. weStories are a unique form of story invention that assist in teaching students story while working on literacy skills, like reading, writing, communicating, and creating visual representations. weStories require two or more children to work in a group to write and create their own story through the use of technologies such as an iPad.

The Study

Data was collected and analyzed through observations while working on an integrated learning project, known as a weStories, which includes the development of storytelling and social skills that also integrates technology. By observing students at the United Cerebral Palsy of Central Florida (UCP), this study analyzed the advantages and disadvantages of using weStories, iPads, and the story invention process with students who have autism. This study was conducted to determine if weStories, a unique story telling strategy that is based on research conducted by Gunter and Kenny (2008, 2012), has potential with students who have autism. The following research question was used to collect data and guide the research:

1. What are the behaviors demonstrated by students with autism using iPads to create weStories?

Design

This study utilized an ethnographic research method that utilized qualitative data analysis to interpret the potential of using the weStories intervention and iPads with students who have autism. Ethnographic research provides thoroughly detailed observations of the individuals

involved in the study. This type of research will often provide a basis for future research in its area. Ethnographic research gathers qualitative data through observations and interviews with the participants, and all parties involved in the study. The data is collected in a naturalistic setting, and the researcher “lives” among the participants in order to collect detailed observations.

Qualitative Data Analysis

Qualitative data, collected as part of this thesis, encompassed discussions, instructional lessons, interactive sessions, interviews, and observations when working with the six students. The next sections will report these observations per day. The observations focused on the areas of motivation, student performance during the instruction sessions, interaction with others, and the ability to create a collaborative story with a teammate on an iPad.

Day One

The researcher began interactions with the four students with disabilities through discussion to obtain a baseline measure of student’s previous knowledge and develop a rapport between the participants and the researcher.

The researcher was introduced to the students in order to create cohesiveness between the researcher and participants. The purpose and procedures of the study were explained to the students. The students were all extremely excited and anxious to use an iPad. S3, S4, and S5 reported having used an iPhone before but never used an iPad. Each student was given his or her own iPad to use, and since it was a designated math time, apps for mathematics were used to familiarize the students with navigating the iPad. Each iPad already had the apps preloaded for lessons with the students, they were: *Butterfly Math*, *Simple Math*, and *Kid Math*. The students

were able to go in and out of the apps and choose which app they wanted to use. Students were provided with an educational coach to guide them through using the iPad. All students were observed enjoying their time using the iPad.

S1: Student one chose to stay on the same game, *Butterfly Math*, the entire time. *Butterfly Math* involves a lot of stimulation and graphics. He really enjoyed the motion and movement of the app. The app provides reinforcement through stars and phrases like “great job!” He showed some attention difficulties and had to be reminded multiple times to stay on task and focused. Noticed that he was not using appropriate eye contact and did not want to be touched.

S2: The student explored all of the different apps, but kept going back to the same app *Kid Math*. He was doing extremely well on this app and was acquiring a lot of points. He kept showing everyone his score and was very proud of how well he was performing on this app. Since student two has cerebral palsy, his motor skills made using the iPad a little more difficult than it was for the other students. He stayed on task the whole time and excelled in math. An increasing score and receiving golden stars as reinforcement kept his interest in the app.

S3: Student three had the most difficult time with the assignment. He could not stay focused on any of the apps or on anything. He displayed a lot of repetitive behaviors, compulsive hand movements, and never used eye contact. He became so frustrated at one point that he began to cry and scream. He required the full attention of the adult coach at all times.

S4: Student four was always touching others and seemed to have little concept of personal space. He enjoyed working on the iPads and tried all of the apps. He always wanted to try a new one. He did not stay concentrated on one app for more than two minutes. If there were unlimited apps he would have tried every single one.

The typically developing, on grade level S5 and S6 did not participate in this baseline measure day.

Day Two

This day started with the researcher using open-ended interview questions to the students to learn student knowledge of story and feelings toward story in a story circle. All six students participated on day two.

Student Responses

(1) Do you like to hear stories?

All six of the students reported liking to hear stories. S5 and S6 want to read and hear stories over and over because they are exciting and interesting.

(2) Do you like to tell stories?

All of the students reported liking to tell stories.

(3) What is your favorite kind of story? Why?

S2, S3, and S4 all like scary stories the best. Student one does not like scary stories because they make him feel very scared. While discussing scary stories S3 got up and ran over to the light switch and turned it off, he said that scary stories are in the dark. S5 likes mysteries and S6 likes folktales and stories about Rosa Parks. S2 likes stories about aliens and monsters.

(4) How do you feel when you hear a scary story?

All Students reported feeling scared during a scary story.

(5) What would you do if your friend starting crying about the story?

S6 responded, "Give them a hug."

S4 responded, "Get out of the situation and do something else."

(6) If you were a character in a story, what character would you be?

S5 said, "I would be a princess who marries a dragon."

S6 said, "I would be Rosa Parks, because she has a lot of courage."

S2 would be a swamp monster teacher.

During the interview questions the typically developing students answered most of the questions completely and elaborated on the questions. The students with autism did not always respond clearly and completely to the questions and got off topic easily. The students with autism had to be redirected and reminded to stay on task.

After the story circle, students were introduced to the *Story Patch* app. Students worked in groups without any instruction to create a story. With no instruction on how to create a story, observations were made on what they knew about story. The *Story Patch* app allows the student to select if they would like to start their story with prompts or with no prompts. The app was explained to each of the students by the researcher. Then, the students began their stories without any instruction on the story invention process. During this time, the students seemed more concerned with building story characters and were not developing stories that had a clear cause and effect. Through observations, the students did have an understanding of story but they all needed direction and one on one attention to help them write their stories.

Day Three

Day three started with teaching the story invention process. The researcher explained that each student needed to develop a realistic fiction story problem. They were instructed to

have a clear setting, problem, rising action, climax, and resolution in their story. They were also told it is important to work together and make this a collaborative effort. After instruction was given the student were paired into three groups of two students. Group one consisted of S6 and S2. Group two consisted of S1 and S3, and group three consisted of S4 and S5. Each group was given their own iPad and each group had an adult mentor helping and instructing them through the story invention process.

For the purpose of this research study, data collected from group three was analyzed and interpreted. Group three consisted of S5, who is typically developing and on grade level, and S4 who has autism. This pairing fits the weStories intervention in which one child is typically developing and one has a learning disability and they work together to create a story with technologies.

Group three selected to use prompts to write their story. This group chose the prompt, “Discovering my own planet.” Although this is designed to be a collaborative project between two students, student five was commanding control of the iPad. The researcher had to keep reminding S5 to include student four in the project. S5 was mainly focused on typing the story, while student four was very interested in adding graphics to the story. S4 was very distracted by adding graphics. He kept selecting graphics that had no relation to the topic of the story, for example, cars, boats, and trucks. He enjoyed playing around with the graphics and making them bigger and smaller and flipping them around. S5 asked student four to type one of the sentences and was helping him spell the words. S4 often became distracted and wanted to see the other group’s stories. The researcher had to keep reminding him to stay focused on the story.

Day Four

On day four, the story invention process continued and the students proceeded to work collaboratively on their stories from the previous day. Camaraderie began to form between the groups. When the students entered the room they were so excited to continue on their stories. All of the students were eager to use the iPads.

In group three, S4 was off task much more than on day three. He was very easily distracted and had to constantly be reminded to stay on task. S5 kept more focused on the story, and was making an effort to involve S4 in the story. The students were becoming more conscious of things such as punctuation and grammar while writing their stories. The researcher introduced the notion that students could add pictures of themselves to their story. Pictures can be taken directly on the iPad and then uploaded to the *Story Patch* app and added into their story. S4 and S5 were very excited about this and loved seeing pictures of them. This caused S4 to become more focused and interested in the project again. Group three completed their story at the end of day three.

Day Five

Day five began with a group discussion about how everyone feels about the project so far. Then the researcher explained that each group is going to start on a new story. In order to determine if the students now have a greater understanding of communication through the storytelling invention process the students were instructed to create a story, using one of the prompts provided by *Story Patch*, with less instruction from the adult mentors.

Group three selected the prompt “A trip to grandma’s house.” S4 and S5 worked together very well this day. S5 was still more in control, but she always asked student four questions to

keep him involved. They worked together to come up with the story line, problem, and conclusion. They also selected graphics to add to their story together. Other groups still distracted student four. Whenever another group laughed or got excited about their story he wanted to see what they were doing.

Teacher Observations

In addition to the researcher's field notes on observations, the classroom teacher made these observations about the overall experience of using weStories by way of *Story Patch* with the students with autism and the typically developing students in her class:

“I found the use of *Story Patch* and iPad useful for my students. I am happy with how easily the students adapted to using this new technology. With our story unit in progress, this was a wonderful addition to help the students understand the elements of the story. *Story Patch* with prompts, I feel, was the most developmentally appropriate activity for the students with which the students could work most independently. Some students needed more guidance than others from the teachers. Some of the students worked well writing their stories with very little input from the teachers. I feel the prompts in *Story Patch* provided the needed direction for the student's stories and helped them remain on topic without letting their wonderful imaginations drift away from the story topic. Students liked working with the iPad and were editing independently at the end - especially with the graphic choices. The graphic choices allowed some of the students who do not enjoy drawing a creative outlet with which they felt comfortable. I feel this was a wonderful introduction to writing their own stories in class as a last trimester project.”

Summary

This section outlined the observations of the researcher by day and also provided the teacher observations of this study. The next section includes discussion of what this research yielded and recommendations for future research using weStories and iPads with students who have autism.

CHAPTER FIVE: DISCUSSIONS AND CONCLUSIONS

This research on using technologies with students who have autism, such as iPads and weStories, has shown some potential. Using technology as a learning tool with students who have autism has shown promise in increasing their communication and social skills. This research has the potential to open opportunities for further research involving iPads and storytelling with students who have learning disabilities. The researcher's experience with implementing weStories and iPads with students who have autism seemed to provide a viable and motivating opportunity for children to work collaboratively; enhance problem solving in social situations, and provide exposure to iPads as a learning tool

Research Question Addressed

The research question for this study was: What are the behaviors demonstrated by students with autism using iPads to create weStories? This question may be answered in the following way.

The researcher found that using storytelling, as a tool to help children with autism practice appropriate communication and social skills should be researched further. The students in this study wrote stories about "a trip to grandma's house", "a trip to the zoo", "a trip to the museum", "a birthday party", etc. The pattern that the researcher detected was that each of these stories is a social situation in which children with autism have great difficulty communicating and behaving appropriately. Allowing and encouraging these students to practice and rehearse appropriate communication and social skills through the use of storytelling can perhaps be beneficial when they arise in real life situations.

The children were required to imagine how they would feel, act, and behave in various social situations. All of the children made their characters behave and act appropriately in their stories. The researcher believes that using storytelling as a method to teach children with autism how to act in a social situation can be a very useful tool for these children because it serves as a kind of rehearsal for upcoming situations. Using real life experiences helps students develop appropriate social reactions and assists in helping students find an appropriate voice, and developing the ability to make logical conclusions. Not all student reactions were proper communication and social reactions, however, with guided assistance all students developed an improved way to solve the social issue. The student worked to resolve the problem through the story invention. For example, a mad scientist took over a birthday party in group one's story; in the end, they found a way to become friends with the mad scientist. Developing a solution to the problem in the story and how everyone in the story felt about the problem is crucial for children with communication deficits.

The researcher felt that using weStories to create stories to solve complex social situations and problems together did improve their development of a story with a solution to the social situation and problem.

Limitations

This study showed success and potential for future research however there were some limitations. Those limitations will be discussed in this section.

This study was conducted over a span of five interventions. The study should be implemented over a longer period of time and more frequently, in order to draw more accurate conclusions. If this study were implemented over a longer period of time students would have

more of an opportunity to work with the researcher and their partner to create and develop their storytelling and communication skills. Implementing this study over a longer period of time would also allow for more observations and data to be collected.

This study involved six participants and focused on two of them. If the weStories intervention and methodology was used on a larger population the results gathered could be more reliable. Gathering data from more participants allows for the research questions to be answered on a broader scale.

Recommendations for Further Research

1. Further research should be conducted over a longer period of time and larger number of participants. This would be very beneficial in helping students with disabilities to improve not only communication but understand social situations.
2. Further research should implement story more frequently (i.e. twice a day, two times a week) this would allow the students to learn and develop their storytelling and communication skills more efficiently.
3. Further research should involve a more diverse population in the study this would allow for more factors to be explored. For example, implementing the study on female students with autism, or implementing the study on students with various types of disabilities.
4. Further research should use story prompts with the students tailored to everyday activities such as going to the grocery store, lining up to go to lunch at school, going to the doctor's office, etc. this would be beneficial in helping students with disabilities to improve their communication skills in social situations.

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Appendix A



University of Central Florida Institutional Review Board
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www.research.ucf.edu/compliance/irb.html

Approval of Human Research

**From: UCF Institutional Review Board #1
 FWA00000351, IRB00001138**

To: Glenda A. Gunter and Co-PI: Michelle M. Mariotti

Date: November 04, 2011

Dear Researcher:

On 11/4/2011, the IRB approved the following human participant research until 11/3/2012 inclusive:

Type of Review: UCF Initial Review Submission Form
 Project Title: Using Digital Narrative and the Storytelling Invention Process to Improve the Literacy, Communication, and Social Skills of Children with Disabilities
 Investigator: Glenda A Gunter
 IRB Number: SBE-11-07961
 Funding Agency:
 Grant Title:
 Research ID: G0105045

The Continuing Review Application must be submitted 30days prior to the expiration date for studies that were previously expedited, and 60 days prior to the expiration date for research that was previously reviewed at a convened meeting. Do not make changes to the study (i.e., protocol, methodology, consent form, personnel, site, etc.) before obtaining IRB approval. A Modification Form **cannot** be used to extend the approval period of a study. All forms may be completed and submitted online at <https://iris.research.ucf.edu>.

If continuing review approval is not granted before the expiration date of 11/3/2012, approval of this research expires on that date. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

Use of the approved, stamped consent document(s) is required. The new form supersedes all previous versions, which are now invalid for further use. Only approved investigators (or other approved key study personnel) may solicit consent for research participation. Participants or their representatives must receive a copy of the consent form(s).

In the conduct of this research, you are responsible to follow the requirements of the Investigator Manual.

On behalf of Sophia Dziegielewski, Ph.D., L.C.S.W., CF IRB Chair, this letter is signed by:

Signature applied by Joanne Muratori on 11/04/2011 11:59:41 AM EST

IRB Coordinator

Appendix B

The Centers for Disease Control and Prevention (2012) defines autism as:

Autism spectrum disorders (ASDs) are a group of developmental disabilities that can cause significant social, communication and behavioral challenges. People with ASDs handle information in their brain differently than other people. ASDs are "spectrum disorders." That means ASDs affect each person in different ways, and can range from very mild to severe. People with ASDs share some similar symptoms, such as problems with social interaction. But there are differences in when the symptoms start, how severe they are, and the exact nature of the symptoms.

There are three different types of ASDs:

Autistic Disorder (also called "classic" autism): This is what most people think of when hearing the word "autism." People with autistic disorder usually have significant language delays, social and communication challenges, and unusual behaviors and interests. Many people with autistic disorder also have intellectual disability.

Asperger Syndrome: People with Asperger syndrome usually have some milder symptoms of autistic disorder. They might have social challenges and unusual behaviors and interests. However, they typically do not have problems with language or intellectual disability.

Pervasive Developmental Disorder – Not Otherwise Specified (PDD-NOS; also called "atypical autism"): People who meet some of the criteria for autistic disorder or Asperger syndrome, but not all, may be diagnosed with PDD-NOS. People with PDD-NOS usually have fewer and milder symptoms than those with autistic disorder. The symptoms might cause only social and communication challenges.