THE USE OF VIDEO PROMPTING VIA AN IPAD® AND A SYSTEM OF LEAST-TO-MOST PROMPTING TO TEACH INDIVIDUALS WITH MODERATE INTELLECTUAL DISABILITIES THE VOCATIONAL TASK OF ROLLING SILVERWARE

by

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Liberty University

A Dissertation Presented in Partial Fulfillment Of the Requirements for the Degree Doctor of Education

Liberty University
November, 2013
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ABSTRACT

Kelly F. Williams. THE USE OF VIDEO PROMPTING VIA AN IPAD® AND A SYSTEM OF LEAST-TO-MOST PROMPTING TO TEACH INDIVIDUALS WITH MODERATE INTELLECTUAL DISABILITIES THE VOCATIONAL TASK OF ROLLING SILVERWARE (Under the direction of Dr. Gossett) School of Education, Liberty University, November, 2013.

This quantitative study was designed to evaluate the effectiveness of video prompting delivered via an iPad® in combination with a system of least-to-most prompting to teach individuals with intellectual disabilities the vocational task of rolling silverware. A single subject, multiple probe research design was used to determine whether there was a functional relationship between the use of video prompting and a system of least-to-most prompting and video prompting alone and the percentage of steps completed correctly in the task of rolling silverware. The findings from this study support the use of video prompting delivered via an iPad® to increase the correct independent responding of individuals with moderate intellectual disabilities on the vocational task of rolling silverware. Additionally, findings support the pairing of a system of least-to-most prompting with video prompting. This study showed that although both were effective, using the system of least-to-most prompting in conjunction with video prompting resulted in acquisition of skills in fewer trials than video prompting alone.

Keywords: video prompting, least-to-most prompting, intellectual disabilities, iPad®
Dedication

There have been so many people that have helped me get to where I am at this moment in time. I dedicate this piece of myself to them. To my parents, Joseph and Maureen Fagan, who have always supported me in all my endeavors. To my husband Jeff, my partner in life and love, who has done everything to make sure that I finish this program. To our children, Kellen, Katie, and Kieran, who are a testimony to perseverance and strength as they have all endured their own struggles and have always encouraged me to finish.

I also would like to express a heartfelt thank you to Dr. Gossett, Dr. Watson, Dr. Chara and my committee members for supporting me through this process. Finally, I would like to thank Dr. Jill Jones who I have felt standing by me and telling me to push through.
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CHAPTER ONE: INTRODUCTION

Background

One of the most significant concerns for parents and teachers of students with intellectual disabilities is their ability to live safe, productive, and independent lives. Students who are able to develop independence have a greater chance of being successful in their lives with and without their caregivers (Pierce & Schreibman, 1994). In 1987, Bucher, Brolin, and Kunce conducted a survey with 713 young adults who had been students in special education programs. They discovered career development activities such as work opportunities, the intensity of job skill preparation, and the percentage of time working on vocational training were predictors of increased employment, self-esteem, independence, and job security. Vocational training should be an integral part of preparing students with intellectual disabilities to enter the world of work (McCrea & Miller, 1999). The unemployment rate for individuals with disabilities in 1986 was around 65% and was reported to be the same nearly 16 years later (Wehman, Brooke, Green, Hewett, & Tipton, 2008). These data indicate the need for a more comprehensive approach to teaching individuals with intellectual disabilities vocational skills that will transition to the workplace.

One component of a functional curriculum for students with intellectual disabilities refers to teaching vocational skills that will increase their employability later in life. Vocational training involves students receiving instruction prior to placement in the work setting as well as instruction within the actual setting where the job skill will be performed. A successful transition from the instructional setting to the vocational setting...
is an essential part of the ability of students with intellectual disabilities to gain employment.

A number of methods have been proven effective in teaching students with intellectual disabilities. Response prompting has been used to teach students with intellectual disabilities functional skills (Lancioni & O’Reilly, 2002; Wolery & Schuster, 1997). Response prompting is the use of systematic strategies to increase the probability of correct responding (Wolery, Ault, & Doyle, 1992). Werts, Caldwell, and Wolery (1996) discovered students with intellectual disabilities can learn new skills by observing peers with or without disabilities. R. D. Horner and Keilitz (1975) demonstrated the effectiveness of the least-to-most prompting method for training individuals with intellectual disabilities how to brush their teeth. Least-to-most prompting involves moving through a hierarchy of prompts until the correct response is achieved (Wolery, Ault, & Doyle, 1992). A number of studies demonstrated video modeling techniques to be effective when teaching students with intellectual disabilities chained tasks (Rehfeldt, Dahman, Young, Cherry, & Davis, 2003). Murzynski and Bourret (2007) combined the use of video modeling with least-to-most prompting to teach the domestic chained tasks of folding clothes and making a sandwich. As new studies have been added to the body of literature, video prompting has appeared as a variation of video modeling (Le Grice & Blampied, 1994).

*Video modeling* involves showing a learner a video of an individual performing a sequence in its entirety and asking the learner to perform the skill depicted. *Video prompting* involves showing a learner a video clip of one step in a sequence and then giving the learner the opportunity to perform the step before viewing and performing
each subsequent step (Cannella-Malone, Sigafoos, O’Reilly, de la Cruz, & Lancioni, 2006; Sigafoos et al., 2005). Video prompting has been shown to be more effective for individuals with disabilities as it requires shorter periods of attention and memory, both of which are often deficient in students with intellectual disabilities. Video prompting offers all the advantages of video modeling as well as the added benefit of reducing the amount of attention and retention required for task completion (Cannella-Malone et al., 2006). In 2011, Canella-Malone et al. conducted a replication of the 2006 study that compared the effectiveness of video modeling to video prompting to teach seven students with intellectual disabilities to wash clothes and was dishes.

The purpose of the current study was to determine the effectiveness of using video prompting presented via an iPad® in conjunction with the least-to-most prompting method to teach students with intellectual disabilities the vocational task of rolling silverware. Rolling silverware was selected as the vocational task because several restaurants in the area serving as community-based instruction sites request this task as a potential job for students.

**Problem Statement**

Students with intellectual disabilities often require many repeated trials to master even a simple task, as they tend to have problems with motor planning and cannot perform tasks without a visual model. This researcher has found many of the available vocational opportunities require off-site practice that can be very time consuming for a teacher to implement. Much of the instruction done with students with intellectual disabilities is teacher-directed. An instructional tool that could provide guided practice would be very helpful, and video prompting has the potential to address these needs.
Purpose Statement

The purpose of this study was to evaluate the effectiveness of using video prompting presented via an iPad® and a system of least-to-most prompting as a treatment package to teach individuals with intellectual disabilities the vocational task of rolling silverware. This researcher conducted a review of literature related to video modeling, video prompting, computer-based instruction, and other systematic prompting strategies used to help individuals with disabilities acquire the skills they need to function in life and society. Although previous research has shown both least-to-most prompting and video prompting to be effective in teaching students with intellectual disabilities a wide range of skills, combining the two procedures as a treatment package has not been thoroughly examined. The use of an iPad® as a delivery system has also not been explored.

Significance of the Study

Students with intellectual disabilities often encounter significant challenges when trying to obtain employment after exiting their secondary education programs. One factor in moving successfully into a workplace is the individual’s ability to transition to an employment setting and decrease the amount of support needed to complete a specific job (Brooke, Revell, & Wehman, 2009). This study offers the potential to create self-sustaining support specific to a job when an individual might need repetitive training both in the educational setting and on vocational job sites. As the effects of integrating children with disabilities into the general education setting become more prevalent, teachers will continue to explore ways to effectively teach this very diverse population. Teachers of students with intellectual disabilities continue to struggle with teaching more
heterogeneous groupings of students with varying abilities and time management for instructional purposes. This research study was designed to show there is a positive relationship between the use of video prompting with a system of least-to-most prompting and the acquisition of a vocational skill by students with intellectual disabilities. Teachers of students with moderate intellectual disabilities often have a wide range of students who require highly individualized and specialized instruction. Teachers often cannot teach in a group setting due to the individualized needs of the students.

As video technology continues to become more accessible, easier to use, and more widely available, it is necessary to explore the possible areas in which this technology could be beneficial with students with intellectual disabilities (Sturmey, 2003). A medium that would allow for students to repeatedly practice a task without direct teacher supervision would not only help to develop the independent living skills of these students, but also give the teacher an opportunity to work with other students. Video prompting is promising as an alternative means of presenting tasks to students efficiently and systematically. Identifying effective research-based methods for teaching functional skills to students with disabilities is critical for maximizing independent functioning (Ducker, Didden, & Sigafoos, 2004).

**Research Questions and Hypotheses**

The following research questions and hypotheses were addressed in this study:

Research Question 1: How effective is video prompting, presented via an iPad®, in facilitating the correct, independent completion of steps in rolling silverware by students with intellectual disabilities?
Research Question 2: How effective is video prompting, presented via an iPad®, in combination with a system of least-to-most prompting, in facilitating the correct, independent completion of steps in rolling silverware by students with intellectual disabilities?

Research Question 3: What are the perceptions of the participants and interventionists regarding the use of video prompting as an intervention with regard to acceptability and effectiveness in teaching individuals with intellectual disabilities the vocational task of rolling silverware?

If empirical evidence shows video prompting alone and video prompting combined with a system of least-to-most prompting to be effective in teaching students with intellectual disabilities a vocational skill, this could be useful to classroom teachers in program planning. The processing speed, screen size and resolution, touch screen operation, extended battery life, and portability of the iPad® were also of interest to this researcher as these features make the iPad® an ideal tool for this application. This researcher had an interest in this question because it impacts how instruction is carried out for students with intellectual disabilities. If instruction using video prompting is effective, as previous literature has shown, it will influence the delivery of instruction for this special population of students, particularly in the vocational setting. As technology advances and manipulation of digital media becomes more widely available, the natural progression would be for a successful application of this technology to be used in job training and special education classrooms.
Definition of Key Terms and Abbreviations

The following definitions are provided to ensure uniformity and understanding of these terms throughout the study.

*Adaptive behavior* – the age-appropriate behaviors necessary for people to live independently and function in society.

*Autism* – developmental disability that usually appears during the first 3 years of life, characterized by significant deficits in social interaction and communication, and coupled with an extremely limited range of activities and interests. Autism runs along a continuum and can be mild to severe.

*Baseline* – a measurement used as a basis for comparison.

*Behavioral reproduction* – the process of organizing one’s own responses in accordance with the modeled pattern of behavior.

*Chained task* – a type of task that is presented sequentially.

*Cognitive rehearsal* – using imagination to think about having a positive interaction or experience.

*Competitive employment* – employment in an integrated setting, at or above minimum wage.

*Computer-based video instruction* (CBVI) – a type of simulated training that is delivered in video segments via a computer.

*Continuous time delay* (CTD) – a response prompting strategy designed to provide and fade prompts in a systematic manner on a time dimension.

*Developmental disabilities* – a term used to describe a severe, chronic disability of an individual due to a mental or physical impairment or a combination of both.
**Error correction procedure** – a procedure used to communicate that a response is incorrect and to facilitate the learner in making the correct response.

**Individualized education plan (IEP)** – a plan developed by an educational team for each student receiving special education services.

**Intellectual disability (ID)** – a condition of arrested or incomplete development of the mind characterized by impairment of skills and overall intelligence in areas such as cognition, language, and motor and social abilities. An intellectual disability can occur with or without any other physical or mental disorders.

**In-vivo modeling** – in-person or live-modeling.

**iPad®** – a tablet computer designed, developed, and marketed by Apple primarily as a platform for audio-visual media such as books, periodicals, movies, and multiple computer applications.

**Keynote** – an application made for the iPad® that allows the user to create, edit, and share multimedia presentations with graphics, animations, and charts.

**Least-to-most prompting** – a systematic method of assisting students in the learning and skill acquisition process. Prompts are only used as a support to students when necessary and only for as long as is necessary, and there is a plan in place for phasing out all levels of prompts starting with a minimal prompt.

**Mental retardation** – a disability characterized by significant limitations both in intellectual functioning and adaptive behavior as expressed in conceptual, social, and practical adaptive skills (American Association on Mental Retardation, 2002).

**Moderate intellectual disabilities** – intellectual functioning ranging from an upper I.Q. limit of approximately 55 to a lower limit of approximately 40.
Personal digital assistant (PDA) – a handheld device designed to facilitate organizational ability from a mobile platform.

Procedural fidelity – the degree to which an independent variable is implemented.

Prompt – a cue or assistance to illicit a response.

Prompt hierarchy – a systematic strategy used to assist students in learning and retaining a skill. The level of prompt given can be from least-to-most support or most-to-least support and is faded as soon as possible.

Reinforce – a reward or stimulus given to encourage a response or action in order to increase the chances that the response will occur again.

Single subject research design – a type of experimental study designed to investigate the effects of the independent variables on the behavior of individual subjects. Single subject designs are primarily used to show the changes an individual demonstrates as a result of some sort of treatment or intervention and are primarily used in the fields of psychology, special education, and human behavior.

Systematic instruction – sequence of instruction that is carefully planned, organized, and presented.

Task analysis – the technique of carefully examining a particular task to discover the elements it comprises and the processes required to perform the task.

Video iPod® – a pocket sized device produced and marketed by Apple that can play music and video files.

Video modeling – presentation of a video of a model completing a total chained task participants are required to view at the beginning of a training session (Le Grice & Blampied, 1994).
Video prompting – presentation of a video clip of one step in a task and then giving the person the opportunity to complete that step before the next step is shown.

Identification of Variables

The independent variables in this study were the use of video prompting presented via an iPad®, and the use of video prompting presented via an iPad® with a system of least-to-most prompting.

The dependent variable was the percentage of steps of the task analysis the students completed correctly in the vocational task of rolling silverware.

Assumptions

Assumptions made for this research study were the students included in the study represented the sample of students with intellectual disabilities for which this research was intended. Participants were screened for the visual attention, motor skills, and the ability to follow a video prompt. The participants in this study were not aware they were in an experiment and had adequate vision and behavior to participate. The video sequence for rolling silverware was identical through all phases.

Limitations

Limitations of the study included the small sample size due to the low incidence of this population. To control threats to external validity, experimental effects were replicated across participants. The follow-up phase was relatively short and replications across settings and within the actual restaurant were difficult due to time constraints and limited availability of transportation to and from the restaurant.
Research Plan

The study utilized a single subject research design. R.D. Horner (2005) stated single subject designs are used to study behavioral changes that occur with the implementation of a treatment or intervention. Single subject research has long been recognized as providing specific value to the field of special education (Kennedy, 2005). In fact, many of the best practices used with students in special education today are the result of single subject research designs (R. D. Horner et al., 2005). This design helped determine whether there was a functional relationship between the introduction of video prompting presented via an iPad® and the correct, independent completion of steps in rolling silverware by students with intellectual disabilities. This study also determined whether the supplementary effect of combining least-to-most prompting with video prompting presented via the iPad® was more effective than video prompting alone. This study also examined the social validity or acceptability of using an iPad® and a system of least-to-most prompting to teach individuals with intellectual disabilities the vocational task of rolling silverware. An iPad® 3Gs was used in the study, and Keynote was used on the iPad® to present the video clips. The video clips were filmed using a high resolution camcorder from the student’s perspective. Each video clip demonstrated a step in the task analysis paired with a verbal prompt. The clip included a model that only showed the arms of the subject. The clips were edited and converted to a supporting format. According to Tankersley, Harjusola-Webb, and Landrum (2008), single subject research designs are aligned with the primary goal of special education—individualized instruction and continuous monitoring of student progress and offer a powerful method in determining effective interventions for individuals with disabilities.
CHAPTER TWO: REVIEW OF LITERATURE

Introduction

One of the fundamental goals of vocational training for students with intellectual disabilities is to help them perform job related skills as independently as possible (Van Laarhoven, Johnson, Van Laarhoven, Grider, & Grider, 2009). For individuals with a disability, the ability to perform a vocational task has been shown to lead to more functional activity and increased involvement within the community (Reid, Green, & Parsons, 1998). Slaton, Schuster, Collins, and Carnine (1994) defined the term functional to “describe skills that (a) are immediately useful, (b) are required in a variety of settings such as school, vocational settings, and/or home, (c) promote independence, and (d) encourage youth with disabilities to participate in natural environments” (p. 150). The purpose of this chapter is to provide a comprehensive overview of issues and research related to the use of video modeling to teach students with disabilities. The current study was designed to investigate the effectiveness of using an iPad® and a system of least-to-most prompting to teach individuals with intellectual disabilities the vocational task of rolling silverware.

Although there have been numerous advances in job training programs and incentives for employers, a large number of individuals with disabilities are unable to obtain competitive employment. In a 2004 Harris Survey, it was discovered that only 35% of individuals with disabilities were employed either full-time or part-time as compared to 78% of those without a disability (Brooke et al., 2009). A number of factors contribute to individuals with disabilities not being able to secure employment. Rusch and Braddock (2004) reported that for every one individual participating in a competitive
employment setting, three people are being served in center-based programs or sheltered workshops. States like Alaska, Connecticut, Indiana, Louisiana, Massachusetts, New Hampshire, Oklahoma, Pennsylvania, and Vermont have much higher rates of participation in competitive employment by persons with disabilities (Braddock et al., 2005). Research indicates the use of evidence-based practices that work toward moving the traditional center-based training centers into community integrated programs as being responsible for individuals being able to gain competitive employment (Becker, Xie, McHugo, Halliday, & Martinez, 2006). Furthermore, a survey conducted on consumer attitudes toward companies that employ individuals with disabilities indicated nearly 87% of those surveyed would prefer to give their business to a company that employs individuals with disabilities (Siperstein, Romano, Mohler, & Parker, 2006).

As students with disabilities exit special education programs within the public school system, it is imperative that both parents and educators continue to find ways for people with disabilities to secure jobs in competitive employment settings (Brooke et al., 2009). One of the most important factors for the successful transition of individuals to the workplace is the provision of necessary supports. These supports include the use of systematic instruction and a wide range of workplace accommodations. Most job tasks or job routines used in employment settings by individuals with disabilities are chained tasks that consist of multiple steps. These tasks are analyzed and broken into smaller sequential steps that are then taught using a systematic prompting procedure (Snell & Brown, 2006).

Potential employers are aware of the fact that individuals with intellectual disabilities often require a significant amount of training to develop vocational skills that
will be useful in competitive employment settings (Cimera, 2006). Researchers have found the use of simulated training to be very helpful in facilitating a successful transition by students with intellectual disabilities to a job site (Lattimore, Parsons, & Reid, 2007). A growing body of research also reveals video modeling to be an effective and efficient way to teach students with intellectual disabilities different skills. The use of video modeling consists of an individual viewing a video of a skill sequence either in its entirety or in segments, and then being given an opportunity to perform that skill. The video can be presented alone or in conjunction with other instructional techniques, such as prompting hierarchies (Ayres & Langone, 2005; Bellini & Akullian, 2007; Delano, 2007). Video modeling, when used with students with disabilities, comprises varying presentation formats, including video prompting and video priming (Cannella-Malone et al., 2006), video self-modeling (Hitchcock, Dowrick, & Prater, 2003), and computer-assisted instruction (Alberto, Cihak, & Gama, 2005).

**Conceptual or Theoretical Framework**

To a large extent, human learning occurs through observing others. Observational learning occurs as a result of observing others and then organizing and rehearsing the modeled behavior (Bandura, 1968). Bandura’s (1977) social learning theory highlights the function of observational learning and accentuates the potential benefits of behavioral modeling. Bandura (1977) states: "Learning would be exceedingly laborious, not to mention hazardous, if people had to rely solely on the effects of their own actions to inform them what to do. Fortunately, most human behavior is learned observationally through modeling: from observing others one forms an idea of how new behaviors are performed, and on later occasions this coded information serves as a guide for action."
According to Bandura (1986), there are four factors in observational learning: attention, retention, production, and motivation. The attending process involves a person attending to and responding to stimuli. Video modeling facilitates this process by selectively focusing attention on selected stimulus and helping the learner process the information for retention through visual imagery. The production process occurs when the individual can imitate or model the behavior and the motivational process involves learning in the context of reinforcement. Students with intellectual disabilities respond best when they are able to focus their attention on relevant stimuli. Presentation in video format provides a highly predictable, repetitive, and routine format that remains consistent throughout the intervention. Video modeling is an extension of behavioral modeling and uses advances in technology to expand on the concept of observational learning. Video modeling has been used with children and adults with and without disabilities. Information is retained through the use of visual monitoring, cognitive rehearsal, and behavioral reproduction (Carroll & Bandura, 1986). Video presents the mental imagery students with intellectual disabilities might have a difficult time generating. The video model provides the prompt the student might need for cognitive rehearsal and the isolation of the viewing area of the computer screen might help to minimize distractions (Sherer et al., 2001). Many children with intellectual disabilities do not consistently attend to stimulus in their natural environment (Darden-Brunson, Green, & Goldstein, 2008). The use of an iPad® has the potential to provide students with intellectual disabilities another opportunity via a different modality to learn a skill through observation.
Review of the Literature

Mental retardation and intellectual disabilities

Mental retardation is viewed as a life-long condition that results in reduced cognitive capacity and a varying degree of adaptive behavior difficulties ranging from mild to profound. Over the past 10 years, Schalock et al. (2007) reported the term *intellectual disability* is being used in place of the term *mental retardation* in peer-reviewed literature. This is in response to many disability sensitivity initiatives and has raised a number of questions regarding the meaning. The term intellectual disabilities encompasses the same population of individuals who were previously diagnosed with mental retardation and emphasizes the need for the same individualized level of support.

Daily, Ardinger, and Holmes (2000) reported intellectual disability is present in approximately 2% to 3% of the population either by itself or as part of a syndrome or related disorder. The cause of the intellectual disability is attributable to an identifying factor in less than 50% of cases. It has been estimated that approximately 10% of individuals with intellectual disabilities fall in the moderate range of cognitive functioning. Individuals with moderate intellectual disabilities can carry out vocational and daily living tasks with a moderate level of supervision. Patton (1986) noted the ability to separate stimuli from background noise or distractions and the use of abstract terminology or verbal cues present challenges to individuals with intellectual disabilities. Although many evidence-based practices have been utilized with individuals with disabilities, the use of visual supports and prompting strategies are some of the most common. Combining a system of least-to-most prompting and video prompting has the
potential to be an effective treatment package for teaching a chained task to individuals with disabilities.

**Early pioneers in special education**

One of the most innovative researchers in the field of special education was Dr. Marc Gold, who believed the level at which a person with mental retardation can function is directly related to the ability of society to effectively train that individual (Gold, 1980). Dr. Gold developed a systematic training program called *Try Another Way*, based on a framework of training individuals with severe disabilities to perform tasks that could help them acquire employment outside of sheltered settings. Gold (1980) based his research on six philosophical beliefs: (a) individuals with disabilities are best served by training them to complete marketable tasks, (b) individuals labeled mentally retarded are more successful in learning situations that are based on their strengths, (c) individuals with even the most significant disabilities have the ability to learn and complete tasks when given appropriate instruction, (d) lack of acquisition of a skill should be first viewed as an instructional deficit before being attributed to a learner deficit, (e) testing an individual limits an individual with a label such as mental retardation, and (f) labeling an individual with a disability serves no function other than to develop barriers (Gold, 1980).

Dr. Gold (1980) had a strong opinion about the difference between being intelligent and being able to be taught a valuable skill. His belief was that one did not have to be intelligent (by I.Q. tests) to be able to complete a job that had worth or value. He felt that it was up to the teachers to identify skills that were of value and could be broken down into teachable components. Gold (1980) emphasized breaking tasks down into very small instructional parts through task analysis. He did not believe individuals
with disabilities should be relegated to meaningless tasks, but rather should be taught tasks that could help them in the vocational setting. The use of an instructional tool like video modeling has been shown to be effective in helping individuals with disabilities acquire various skills. Gold believed an individual’s ability to perform a specific task is dependent upon the type of support provided as well as systematic instruction that is in place. He also believed decreasing dependency on support staff is critical for successful vocational training to occur. Video modeling has demonstrated the potential to fulfill Dr. Gold’s vision to *Try Another Way*.

**History of video modeling**

Research into the use of video modeling with individuals with disabilities began over 30 years ago and includes about 150 published studies (Dorwick, 1999). The majority of the published studies focused on teaching individuals with disabilities skills that will enable them to function more independently in society. Video modeling has been successfully used to teach a variety of skills to individuals with disabilities (Collins, Gast, Wolery, Holcombe, & Leatherby, 1991). Under some conditions, video modeling achieved better results for skill acquisition, generalization, and maintenance in students with autism than did live presentation (Charlop-Christy, Le, & Freeman, 2000).

One of the first research studies documenting the use of video modeling began at the Denver National Asthma Center. While working with a child with social deficiencies, psychologists Creer and Miklich (1970) videotaped the same child role-playing socially appropriate behavior. The child then viewed the tape and his social skills behavior improved. Creer and Miklich (1970) discovered it was not the role-playing exercise that improved the child’s social behavior, but rather the child viewing
himself modeling the appropriate social behavior. Daily living skills have also been taught using video modeling. Rehfeldt et al. (2003) used video modeling to teach three adults with intellectual disabilities how to prepare a simple meal for themselves. Three individuals with moderate to severe mental retardation watched a 2.5 minute video of an adult with a disability making a peanut butter and jelly sandwich. After baseline and probe data were collected, the participants were given the verbal prompt, “make a sandwich.” If the step was completed correctly, the participant was verbally praised. If the participant did not perform the step correctly, the instructor completed that step. If the participant did not perform all the steps correctly they viewed the video again and were then given another opportunity to make the sandwich. The intervention continued until the participant could perform 100% of the steps correctly. All of the participants mastered the task and were able to generalize sandwich making to another setting. The participants were able to demonstrate the skill at follow-up one month later.

As individuals with disabilities develop more independence, it is only natural that they receive less supervision and support. With decreased supervision, preparing individuals to manage an emergency situation through safety skill instruction becomes important (Taber, Alberto, Hughes & Seltzer, 2002). Several studies address safety skill instruction in the literature. In a 2009 study, Mechling, Gast, and Gustafson used a video modeling procedure to successfully teach individuals with moderate intellectual disabilities how to extinguish cooking related fires. Using a multiple probe design, three individuals with intellectual disabilities were taught three fire extinguishing behaviors. The individuals were all able to extinguish the fire and generalize the skill to other environments. The skill was maintained even after the video model was no longer
present. Results of this study illustrate that video modeling could be effective in teaching individuals with intellectual disabilities a safety skill.

Video modeling has also been used to develop conversation skills. Charlop and Walsh (1986) used video modeling as an instructional prompt to facilitate communication and help students with autism make affectionate statements to members of their families. In another study done by Charlop and Milstein (1989), children with autism were taught basic conversational speech using video modeling procedures. The children were shown a video of adults modeling a scripted conversation about toys. During the training phase, the students were given edible reinforcers; however, during the generalization phase the reinforcers were withdrawn. All three children acquired the scripted conversation skills and also began to make unsolicited statements about the toys that were not part of the script. The positive results show that video modeling can be an effective tool used to teach students with autism conversation skills. The study also demonstrated a more rapid acquisition of skills using video modeling as compared to a live model, and skills learned through video modeling were generalized across environments and maintained through the follow-up phase.

D’Ateno, Mangiapanello, and Taylor (2003) conducted a study that showed video modeling by an adult to be an effective strategy for teaching a child how to pretend to have a tea party and increase imaginative play skills in children with autism. The child not only participated in this pretend play without prompting, the child learned to do this after watching only a 5-minute video. It was determined that video modeling can be an effective tool used to teach students with autism play-related conversation skills. The study also demonstrated a more rapid acquisition of skills using video modeling as
compared to a live model, and skills learned through video modeling were generalized across environments and maintained through the follow-up phase.

Allen, Wallace, and Renes (2010) conducted a research study into the use of video modeling to teach vocational skills to individuals with autism spectrum disorders. In this study, four adolescents diagnosed with autism were trained using a video model to wear a Walk Around Mascot costume and entertain customers in a store. The video demonstrated the interactions that they were to have with the customers. All four participants learned the skills necessary to perform the job, including shaking hands, waving, and interacting with customers. Results of this study support the use of video modeling to teach a vocational skill embedded in a social setting to individuals with autism.

In a study conducted by Bidwell and Rehfeldt (2004) three adults with mental retardation were taught a domestic skill (making coffee) with a social component (sitting down with a peer) through video modeling. The skill was generalized across settings and to different social partners. The results of this study support video modeling as an effective intervention to teach a domestic skill with a social component to individuals with intellectual disabilities.

**Video prompting**

Video prompting is a variation of video modeling in that the video clip is broken down into smaller clips that are viewed individually. Video prompting requires the student to perform a motor response before advancing to the next step in the task (Crusco, Carter, & McGrath, 1986). Many times, watching the entire skill all at one time is too difficult for individuals with disabilities. Breaking the stops down into more manageable
parts could be a useful technique when teaching more complex task sequences to individuals with disabilities. In a 2005 study conducted by Sigafoos et al. video prompting was used to teach students with mental retardation how to use a microwave to pop popcorn. Participants viewed each of the 10 steps in the task sequence of operating the microwave one at a time. The participants were instructed to perform each step immediately after viewing the video model clip. Two of the three participants acquired the skill and maintained the skill even after the video prompting intervention was withdrawn. The third participant did not acquire the skill. Results showed video prompting may be an effective strategy to teach individuals with disabilities daily living skills. The results were maintained through a 10-week follow-up. In an expanded study in 2007, Sigafoos et al. determined video segments could be chunked together as the participant began to master the steps within the task sequence. As the participant began to perform the steps in the task sequence of dishwashing, the video was chunked into 3-step segments. The participant viewed the 3-step segment clip and then was given a verbal prompt to perform the sequence. As the participant met criterion, the video clips were chunked into two 5-step segments. When the video prompt was withdrawn there was some deterioration in correct responding. The video prompt was then faded through a 3-step fading procedure. The participant was able to learn and retain the skill using this method. This research supports the use of video prompting and fading to teach individuals with intellectual disabilities a vocational task.

Using a multiple baseline design, Horn et al. (2008) evaluated the amount of steps that were required in a video model for three individuals with mental retardation to complete a 10 step laundry task. Participants viewed the complete video and then were
shown shorter segments until they were able to perform all of the steps accurately. One student learned the task within two views while another student learned the task in three views. The third participant needed least-to-most prompting to learn the skill. Overall the study showed that each student needed the task broken down into a different number of segments to successfully complete the task. The findings illustrate the highly individualized nature of instruction within this population and the flexibility that video prompting might be able to provide. The existing research demonstrates video prompting alone can help increase student independence and decrease reliance on support staff across many skills (Cihak, Alberto, Taber-Doughty, & Gama, 2006; Sigafoos et al., 2007).

As the body of literature continues to grow, the research suggests that video prompting might be a more effective strategy than video modeling for individuals with intellectual disabilities (Sigafoos et al., 2007). Video prompting shows the video clips whereas video modeling shows the skill in its entirety. For individuals with intellectual disabilities memory and attention may affect the ability to master the skill. In a study conducted Canella-Malone et al. (2006) results indicated that video prompting was more effective than video modeling in teaching two daily living skills to individuals with intellectual disabilities. In a replication of the same study (Canella-Malone et al., 2011) results indicated that video prompting was more effective than video modeling when teaching daily living skills to individuals with intellectual disabilities. Miltenberg (1997) notes that for modeling to be effective the observer must watch the entire sequence. Video prompting is delivered in short video clip sequences compared to a clip in its entirety in video modeling.
Computer-assisted instruction

As school systems continue to experience funding cuts and reductions in allotments, recent attention has been given to studies that simulate real life field experiences using video presented instruction. Computer-based instruction involves simulated training using video clips and the computer. One of the benefits of using computer-assisted instruction is that it is highly interactive and includes video of an environment in which the skill would normally be taught. The use of this medium extends into simulations that have been shown to be effective when instruction in the actual community setting is not possible due to extraneous factors (Shafer, Inge, & Hill, 1986). Mechling, Gast, and Langone (2002) concluded a computer-based video program could be used to successfully teach students with moderate intellectual disabilities how to read grocery aisle signs and locate items in a store. In addition, the students were able to generalize this skill to a grocery store simulated on the instructional video. This form of multimedia promotes attention in students with disabilities, attention that is often difficult to acquire and maintain (Mechling & Gast, 2003).

Mechling and Ortega-Hurndon (2007) used a computer-based video instruction program to teach three adults with moderate intellectual disabilities the domestic tasks of delivering mail, changing paper towels, and watering plants. Results of the study indicated the use of computer-based video instruction was effective in teaching generalized multi-step job tasks to individuals with intellectual disabilities that were maintained over time. A multimedia approach that includes video modeling creates an interactive environment in which students are actively engaged. Using a computer-based video simulation program, Wissick, Lloyd, and Kinzie (1992) taught students with
intellectual disabilities to purchase items from a convenience store. In the simulation program students followed a shopping sequence that included selecting items from the appropriate locations within the store. Participants were able to generalize skills to the actual environment.

Ayres, Maguire and McClimon (2009) taught three elementary aged students with autism three domestic chained tasks using video modeling and computer based simulation training only. All instruction took place on the computer and the students’ ability to perform the tasks as shown was measured. All three students mastered the skills demonstrated on the computer in the natural setting. The skills were maintained at follow-up. Ayres et al. (2009) notes that the advantage to this type of instruction is similar to that of video modeling. Computer based instruction allows for independent learning and provides systematic, consistent instruction and allows the student to independently practice the skill because the prompts are given within the instructional program (Ayres et al., 2009).

**Single subject research design**

R. D. Horner et al. (2005) described single subject research as “a rigorous, scientific methodology used to define the basic principles of behavior and establish evidence-based practices” (p. 165). The Council for Exceptional Children’s Division for Research Task Force (2003) identified four types of research methodologies in the field of special education and quality indicators for each. The four research methodologies identified were: (a) single subject, (b) correlational, (c) qualitative, and (d) experimental group designs. The justification for having four different methodologies was based on the complex nature of special education and the variability of the population served.
Single subject research employs methodologies that involve the treatment of an individual or small group under both a baseline and intervention condition. Researchers measure performance repeatedly under both conditions to determine the effectiveness of an intervention (Tankersley et al., 2008). Single subject research designs are particularly useful in special education settings because participants usually have very different characteristics (Garmezy, 1982).

The low incidence of individuals with intellectual disabilities presents significant challenges in using group comparison designs. Odom et al. (2005) noted the highly complex nature of the special education field as well as the variability in the population. The Individuals with Disabilities Act (IDEA) recognizes 12 categories of eligibility (Office of Special Education and Rehabilitation Services, 1997). Within each of the 12 categories are sub-sets and varying degrees of severity with which a disability presents. Special education also covers the population of individuals served beyond traditional education, ranging from infant and pre-school programs through individuals in their early 20s. The continuum of services associated with special education only complicates an already challenging situation. Infants and toddlers are often served through a family service model while school-age children can be served in a variety of settings as determined by an IEP team (Odom et al., 2005). While conducting special education research, investigators not only must identify effective practice, but also the context in which the practice is effective (Guralnick, 1999).

Historically, special education research derived from the medical field at a time where services for individuals with disabilities occurred in residential facilities (Odom et al., 2005). As the fields of psychology and sociology advanced, research methods
applicable to the field of special education emerged. Many of the research methods utilized today have their underpinnings in general education and educational psychology (Odom et al., 2005). The experimental nature of single subject research design fits the unique and individualized characteristics of individuals with disabilities (R. D. Horner et al., 2005). Research questions often guide the research methodology utilized. Single subject research designs provide the most information when trying to evaluate the performance of something under specific conditions (R. D. Horner et al., 2005). “Single-subject designs emphasize the clinical significance of an individual rather than statistical significance among groups” (Alberto & Troutman, 2006, p. 121).

**Analyzing single subject research data**

The traditional approach to analyzing data from single subject research “involves systematic visual comparison of responding within and across conditions of a study” (R. D. Horner et al., 2005, p.122). The research base to support visual analysis as the primary method of analysis in single subject research first appeared in 1981 (Wampold & Furlong, 1981). The use of statistical analysis appeared in less than 20% of the research reviewed (Brossart, Parker, Olson, & Mahadevan, 2006). When visually inspecting data, the vertical axis represents the dependent variable and the horizontal access represents the time continuum. Conclusions drawn from single subject research designs should be based on the consistency of changes in how the data pattern appeared. An intervention can be considered effective when changes occurred in the data each time experimental conditions were manipulated. Changes that occur are analyzed within and across conditions (Wolery & Dunlap, 2001). Comparing data across these conditions allows the researcher to determine whether a functional relationship exists between the independent
and dependent variables (Tankersley et al., 2008). Researchers can make conclusions when variability, level, and trend of data are consistent with the intervention. Tankersley et al. (2008) asserted that “repeated measurement of target behaviors is critical to single-subject research” (p 280.). Kazdin (1992) added the practice of repeatedly measuring performance over time helps to identify patterns and trends during baseline and intervention phases.

The use of statistical methods to analyze data is controversial within research circles. Wolery and Harris (1982) stated a combination of visual and statistical analysis can be useful when drawing conclusions on data collected and whether changes have occurred within and between experimental conditions. This researcher used both visual and statistical analyses.

**Instructional strategies**

An individual with an intellectual disability learns visual and auditory discriminations more slowly than same-age peers. Generalizing information from one stimulus or situation to another is difficult and short-term memory and recall is also affected. Instruction of students with intellectual disabilities and autism requires teachers to utilize strategies that are explicit and concrete in nature. This instruction includes the use of teaching aids that are structured, systematic, and anchored with a visual reference.

Common characteristics of students with intellectual disabilities include the inability to attend, deficits in memory, inability to generalize skills, and poor incidental and observational learning. Due to deficits in these areas, students with intellectual disabilities need some type of cognitive scaffolding as a support to their learning. This scaffolding supports systematic teaching, task analyzed activities, and visual management
tools. Visual tools appear in work schedules, sequenced tasks, and visual communication systems within special education settings. Picture prompting systems have been used to teach multi-step tasks, including food preparation (Singh, Oswald, Ellis, & Singh, 1995), and vocational job tasks (Copeland & Hughes, 2000). Wacker, Wiggins, Fowler, and Berg (1988) used picture prompt books to teach daily living skills to students with moderate to severe disabilities that were generalized to other settings. The picture prompt books had photographed pictures of task analyzed sequences of simple jobs. Students referred to these picture sequences to complete the task.

**Least-to-most prompting**

According to West and Billingsley (2005), teachers provide response prompts to students with intellectual disabilities in the form of verbal directions, gestures, and physical assistance. These prompts increase the likelihood that the students will perform the behavior in a natural setting. The system of least prompts is a widely held instructional strategy used to teach individuals with disabilities (Wolery, Ault, & Doyle, 1992). The system of least-to-most prompting is designed to elicit a correct response when given a natural cue. The system of least-to-most prompting involves using the least intrusive prompt to the most intrusive prompt required to achieve the correct response and moving along a continuum. Libby, Weiss, Bancroft, and Ahearn (2008) conducted a study comparing least-to-most prompting to most-to-least prompting on the acquisition of solitary play skills in students with autism. The results of the study indicated that although the students experienced fewer errors with most-to-least prompting, they acquired the play skills more quickly using least-to-most prompting. Libby et al. (2009) found the least-to-most prompting strategy allows the learner to make errors, but
encourages independent responding to instruction. If a student responds incorrectly or
does not respond within the designated time frame, a system of prompts is provided
ranging from the least-to-most intrusive. With the opportunity to respond independently,
the learner is only given the level of support necessary to make a correct response. One
advantage of the system of least-to-most prompting is that it does not require a baseline
to be established before implementing and the implementation is systematic (West &
Billingsley, 2005).

Mechling, Gast, and Gustafson (2009) noted picture and video prompts have been
shown to be effective in providing the instructional support necessary for individuals with
intellectual disabilities to independently complete cooking related tasks. Both pictures
and videos were effective in increasing performance levels on tasks; however,
participants showed greater independent responding when using video prompting. Many
times video modeling and video prompting are used together. Individuals first view a
video from beginning to end followed by video clips or segments of each step in the task
(Norman, Collins, & Schuster, 2001). Video prompting breaks the task down into
smaller units, thereby allowing students to digest the material (Hitchcock et al., 2003).

Martin, Mithaug, and Frazier (1992) used picture sequencing paired with a video
prompt to teach a vocational task. In a study conducted by Goodson, Sigafoos, O’Reilly,
Cannella, and Lancioni (2007), the researchers evaluated the effectiveness of video
modeling in teaching four men with intellectual disabilities to set a table. It was
discovered that video prompting alone may not be sufficient for an individual to acquire
the skill to the level of mastery and researchers added an additional error correction
procedure that allowed the individual to watch the video clip for a second time that
provided the opportunity to perform the skill again. If the individual did not perform the skill correctly, the teacher modeled the correct procedure. The combination of video prompting and the error correction procedure resulted in all four participants reaching 100% mastery.

Response prompting strategies have been used as an instructional methodology to teach students with intellectual disabilities throughout the literature (Lancioni & O’Reilly, 2002). The methodology involves the delivery of a prompt to achieve the correct response. The prompt can be verbal, gestural, modeled, partial physical, or full physical (Wolery, Bailey, & Sugai, 1988). The goal is to fade the prompt so independent responding can occur (Wolery, Ault, & Doyle, 1992). Mechling, Gast, and Fields (2008) demonstrated the effectiveness of combining both video prompting with a system of least prompts to teach a cooking task to students with moderate intellectual disabilities. In this study, the video served as a self-prompting tool by delivering prompts for the individuals to complete cooking tasks.

Graves, Collins, Shuster, and Kleinert (2005) demonstrated the effectiveness of video prompting paired with the prompting procedure of constant time delay to teach meal preparation skills to individuals with disabilities. In a study conducted by Murzynski and Bourret (2007), two boys diagnosed with autism were taught daily living skills using video modeling and least-to-most prompting. In the study, four skills were targeted; two using least-to-most prompting and two using least-to-most prompting in conjunction with a video modeling procedure. Both participants taught with video modeling and the least-to-most prompting method together mastered the skills in fewer trials than did participants who received video modeling alone. The results of the study
indicated the efficiency of training can be enhanced with the combined use of video modeling and least-to-most prompting.

In a study conducted by Norman et al. (2001), students with moderate intellectual disabilities were taught three self-care tasks using constant time delay (CTD). The researchers determined the use of CTD and video modeling was effective in teaching students with moderate intellectual disabilities self-care tasks. In a study comparing the effects of video prompting to video modeling, Cannella-Malone et al. (2006) concluded video prompting was the more effective strategy used to teach daily living skills to individuals with intellectual disabilities.

Gardner and Wolfe (2013) conducted a review of video modeling and video prompting interventions for teaching daily living skills to individuals with autism. The findings suggest that video prompting is more effective than video modeling as an intervention for teaching daily living skills with autism. Gardner and Wolfe (2013) also noted that the various factors related to video prompting and video modeling such as the type of presentation (video cassette recorder, laptop, smartphone, IPad®, etc.) the model used in the video, the length of video and error correction procedures are factors that need to be analyzed when considering the use of video modeling or video prompting.

**Technology use and individuals with intellectual disabilities**

Digital media is present in the lives of nearly everyone. With televisions capable of presenting interactive programming in high definition and 3-D at any given time in the day, utilizing this medium for training and teaching is the next logical step. Colleges and universities use video podcasts to present information and to teach courses. Countless video segments are readily available on the Internet, videotapes, and DVDs (Boster et al.,
The moving graphic images provide a stimulating way to present many forms of information. Research has shown students are more interested in instruction and show increased levels of alertness, attentiveness, and interest when multimedia formats are used (Lehman & Brickner, 1996).

Technology has been recognized as a way for individuals with intellectual disabilities to improve job training skills and employment options (Wehmeyer et al., 2006). Favorable results have come from the use of technology with individuals with intellectual disabilities on improvement of independent job performance and related social skills. Davies, Stock, and Wehmeyer (2002) used a self-directed handheld computer that provided audio and video prompts to teach two different vocational tasks to individuals with intellectual disabilities. Results indicated the use of the prompting system was very effective in facilitating correct task performance by individuals with intellectual disabilities while assembling pizza boxes and packaging software. The participants also reported positive reactions to the system. In 2001, Furniss et al. used a portable prompting system that gave pictorial instructions and audio prompts to individuals with intellectual disabilities to complete various vocational tasks. Results indicated the computer-aided prompting system helped individuals with intellectual disabilities accurately complete task sequences.

Kagohara et al. (2012) conducted a review of studies that involved the use of iPod®s, iPad®s and similar devices in teaching individuals with intellectual disabilities. The review found 15 studies that utilized these devices to deliver instructional prompts in areas of communication, academics, vocational tasks, leisure and transitions. There were 47 total participants within the 15 studies ranging in age from four to 27. The results of
the studies were mostly positive and support the use of portable devices to teach individuals with disabilities a wide range of skills.

Kellems (2010) suggested that presenting video modeling on a portable device increases the effectiveness of the intervention compared to traditional video modeling. His research showed that individuals were more motivated to participate in the intervention and the social validity of the intervention increased. Cihak et al. (2007) noted that handheld devices available to the general population are more preferable than the custom devices of the past. Mass produced devices cost less, blend into the community, and are socially appropriate.

**Video modeling**

Corbett and Abdullah (2005) found video modeling to be an effective intervention for students with autism because it focuses their attention on one stimulus in a designated area, draws attention to visual cues, and removes the social interaction component with which individuals with autism often times have difficulty. Hume, Loftin and Lantz (2009) assert that video modeling is one of the few interventions that encourage independence. Video modeling requires the student to focus their attention on instruction that involves minimal assistance from the teacher.

Different types of models have been used with video modeling. These include the use of disabled versus non-disabled peers and adults (Charlop & Milstein, 1989). Norman et al. (2001) changed the perspective of the video from the person filming the video to the perspective of the learner. Video self-modeling allows the individual to see someone else performing the target behavior (Bray & Kehle, 1998). Sherer et al. (2001) used video with the learner using the “self” as model or someone else in the video and
found no difference in the rate of acquisition of skills based on the person doing the modeling. In another study, Ihrig and Wolchik (1988) concluded there were no differences in task acquisition if the model was a peer or an adult. However, these results were not consistent with those of N. J. Barry and Overmann (1977), who found live modeling by peers to be more effective than by adults. Sherer et al. (2001) compared using the “self” as a model versus “other” as model. The self-as-model involved children viewing themselves as the videotaped model while the other-as-model had a peer demonstrating the skill. The results of this study indicated no overall difference in acquisition of the skill whether it was modeled by the student or someone else.

Palechka (2010) compared the effect of a commercially available video model to an instructor made video model on the acquisition of play skills in three children with autism. Each child watched one commercially available video and one instructor made video of different play scenarios. Two of the children learned the play skills faster using the instructor made video while the other child learned the play skills at the same rate for both video conditions. Palechka (2010) noted that the instructor created videos more closely simulated what would actually occur during free play.

Schreibman, Whalen, and Stahmer (2000) successfully reduced disruptive behaviors that occurred during transitions by students with autism using the video priming technique. The students were shown a video of the upcoming transition from their perspective. This proved to be an effective way to signal a previously unpredictable event, thereby reducing the disruption associated with the event. Wert and Neisworth (2003) introduced the concept of video self-monitoring, which involves taking a video tape of the child’s behavior and then editing the video tape to insert a model of a child
using appropriate behavior. Their study revealed this was effective in increasing spontaneous requests in four students with autism. The effects were all maintained during a short maintenance period. Video modeling has also been used to help students with autism and other moderate to severe disabilities generalize their shopping skills (Haring, Breen, Weiner, & Kennedy, 1995). In a study by Haymes (1995), students with autism were taught to initiate conversations with peers using video modeling. Several studies also have been successfully conducted with students on how to avoid potential abductors by role modeling children saying “no” and running away from potential predators (Poche, Yoder, & Miltenberger, 1988). Video modeling has been used to teach parent training for conduct disordered children. Norman et al. (2001) conducted several studies using video modeling and demonstrated self-help skills such as cleaning sunglasses, putting on a wrist watch, and zipping up a coat could also be taught and maintained using video modeling.

Video Modeling provides the opportunity for a multitude of presentation formats that show promise in teaching students with intellectual disabilities. There are several advantages to using video modeling as an instructional strategy. First, several students can watch the same video and the video does not change. Instructional methods for students with intellectual disabilities stress the importance of consistency in instruction. The video can also be used over and over again with the same or different students. This is not possible when using in-vivo modeling and is a limitation to its use. Another advantage, as pointed out by Morgan and Salzberg (1992), is videotaped modeling standardizes instruction and has been shown to be a useful control method.
Video modeling also makes it easier for the teacher to delegate instructional duties. The instruction is arranged so very little knowledge of the task or prompting is needed by the instructor to implement video modeling. The instructor can watch the video to see the sequence and rely on the video model for instructional prompting. Limited research exists that demonstrates the effectiveness of using video based modeling or prompting on handheld devices (Van Laarhoven et al., 2009). Mechling, Gast, and Seid (2009) used a personal digital assistant (PDA) to demonstrate increased task completion by students with autism. Results showed students were able to adjust prompt levels and maintain their ability to use the device over time; however, it was noted that the PDA used in the study may be difficult for some learners to operate. Expanding on this research, Van Laarhoven et al. (2009) conducted a study that evaluated the effectiveness of using a video iPod® as a prompting device to teach job skills to an individual with intellectual disabilities in a community-based setting. Results showed the individual made substantial gains in correct responding as well as reducing the level of prompting necessary for the student to complete the tasks. Van Laarhoven et al. (2009) and Mechling, Gast, and Seid (2009) suggested the need for further research surrounding this technology.

**Multimedia**

As advances in technology continue to increase, several mediums that can utilize this technology have come to light. One of the primary characteristics of multimedia instruction is that it is presented in both a visual and auditory manner (Mayer, Moreno, Boire, & Vagge, 1999). Moreno and Mayer (2000) found information that is presented both verbally and visually positively impacts performance.
In 2008, Cihak and Schrader showed students with autism video clips of themselves performing vocational tasks using a laptop. The portability of the laptop allowed the video to be viewed and used within the work setting and students learned and retained the skill. Ayres and Langone (2005) noted digital video makes video modeling even more useful because the digital output of the video can easily be used within multiple interfaces. Cihak, Kessler, and Alberto (2008) found the use of a handheld computer helped facilitate independent transitions for students with severe intellectual disabilities to a different location while performing vocational tasks. Cihak, Fahrenkrog, Ayres, and Smith (2009) evaluated the efficacy of video modeling presented via a video iPod® to increase independent transitioning within the school for four elementary aged students with autism. During the intervention, students watched ten video modeling segments exhibiting appropriate transition behavior. If the student did not transition appropriately a system of least-to-most prompting was added. All participants reached criterion (100% correct responding during three consecutive sessions) between nine and 15 sessions. The results of this study suggest that prompting and video modeling delivered via an iPod® is an effective intervention that can be used to teach students with autism appropriate transitioning within the school setting.

Hammond, Whatley, Ayres, and Gast (2010) used video modeling to teach iPod® use to individuals with moderate intellectual disabilities. The video model was presented via a computer and resulted in three high school students with moderate intellectual disabilities being able to independently operate an iPod® to watch a movie, listen to music and look at pictures. Individuals were able to generalize and maintain the skill on follow up. Hammond et al. asserted that the iPod® was reinforcing and age-appropriate
for use with middle school students and the participants were excited to be using technology used by their same-age peer.

Dupere, MacDonald and Ahearn (2013) conducted a study that used video modeling with a substitutable loop to teach varied play to young children with autism. The substitutable loop allowed for various play schemes to be modeled for the children. Following the video modeling intervention with the substitutable loop the children were able to imitate play routines with different characters from the video models. As digital media becomes easier to use, this type of substitutable video could possibly be used to teach other skills.

**Summary**

In summary, several areas need further investigation in using video prompting and a system of least prompts to instruct students with intellectual disabilities a chained task. Using a prompting hierarchy in conjunction with video prompting has not been researched to the same extent as video prompting alone. Suggestions for future research include utilizing a self-prompting system that students can independently operate. The use of a video iPod® has been explored in very recent literature, but to date, there are no published studies on the use of an iPad® to teach vocational tasks to individuals with disabilities. The iPad® is unique in that it projects high quality video on a high definition screen. Its portability and ease of use, including its touch screen operation, make this a unique tool that is very different from other devices such as PDAs and DVD players. Herbert (2010) noted the iPad® has the potential to be an all-inclusive device in special education because it has the capability to function as a visual scheduling system, a communication system, a prompting device, and a visual learning tool. Numerous
applications are available, specifically for special education, which provide visual schedules, reinforce positive behavior, and even collect data. The iPad® sells for a fraction of the cost of many devices sold exclusively for students with disabilities. Incorporating the use of technology when instructing individuals with disabilities has the potential to have a positive effect on acquisition and retention of new skills.

Research demonstrates that the use of evidence-based practice leads to more positive outcomes for individuals with disabilities. Even with this knowledge, many evidence-based practices are not utilized by teachers due to lack of perceived efficacy (Alexander, Ayres, Smith, Shepley, & Mataras, 2013). Designing and planning efficient programs that require less time and fewer resources is critical for individuals with disabilities to receive quality instruction and increase their opportunity for positive outcomes (Horner et al., 2005). As the body of literature continues to grow, video modeling and video prompting have the potential to become a very efficient and useful instructional strategy to teach a wide range of skills to individuals with disabilities.
CHAPTER THREE: METHODOLOGY

Introduction

Teaching students with moderate intellectual disabilities the skills they need to obtain and maintain a job is one of the primary focuses within a self-contained special education classroom. Video prompting appears to be a promising tool that can be used to instruct students with intellectual disabilities on how to complete multi-step tasks in a wide range of settings. This quantitative study evaluated the effectiveness of video prompting delivered via an iPad® in combination with a system of least-to-most prompting to teach individuals with intellectual disabilities the vocational task of rolling silverware.

Research Design

The study utilized a single subject research design. In the field of special education, single subject design has been used to explore effective intervention strategies to improve social behavior (Carr et al., 1999), determine appropriate academic interventions (Greenwood, Tapia, Abbott, & Walton, 2003), and reduce problem behavior (Carr et al., 1999). Single subject designs are used to study the behavioral change an individual exhibits after being exposed to a treatment method. The individual participates in both a baseline and treatment phase and data are collected and measured during both phases (Gay & Airasian, 2003). R. D. Horner et al. (2005) asserted that evidence-based practices should be operationally defined, implemented with fidelity, and be functionally related to a change in a dependent measure as well as replication of experimental effects across a number of studies. With those standards being met, single
subject research design is a very powerful tool in determining research-based practices that are effective in teaching individuals with disabilities.

**Research Questions and Hypotheses**

Research Question 1: How effective is video prompting, presented via an iPad®, in facilitating the correct, independent completion of steps in rolling silverware by students with intellectual disabilities?

H1: There will be a statistically significant difference between pre and posttest scores in the correct, independent completion of steps in rolling silverware by students with intellectual disabilities upon implementation of video prompting presented via an iPad®.

Research Question 2: How effective is video prompting, presented via an iPad® in combination with a system of least-to-most prompting, in facilitating the correct, independent completion of steps in rolling silverware by students with intellectual disabilities?

H2: There will be a statistically significant difference between pre and posttest scores in the correct, independent completion of steps in rolling silverware by students with intellectual disabilities upon implementation of video prompting presented via an iPad® in combination with a system of least-to-most prompting.

Research Question 3: What are the perceptions of the participants and interventionists regarding the use of video prompting as an intervention with regard to acceptability and effectiveness in teaching individuals with intellectual disabilities the vocational task of rolling silverware?
H3: Video prompting presented via an iPad® will be perceived positively by participants and interventionists regarding the acceptability and effectiveness in teaching individuals with intellectual disabilities the vocational task of rolling silverware.

Participants

According to the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.; *DSM-IV-TR*; American Psychiatric Association, 2000), the term *moderate intellectual disabilities* is used to describe students characterized by significant limitations both in intellectual functioning (e.g., reasoning, learning, problem-solving) and in adaptive behavior, which covers a range of everyday social and practical skills. One criterion used to determine intellectual disabilities is an IQ test. Moderate intellectual disability refers to individuals with an IQ between 40 and 55. The determination of an intellectual disability is multi-faceted and is made by a multi-disciplinary team of professionals. Students were selected for inclusion in the study based on identified Individualized Educational Program (IEP) objectives in the area of vocational skills. Students were screened and primed for prerequisite skills such as visual attention, the ability to follow a video model, and required motor planning skills on an unrelated task using a modeling skills evaluation assessment prior to participating in the study.

Of the 11 students considered for participation in the study, only four met the criteria to participate. Four participants of high school age were originally targeted for the study. Prior to the implementation of the research, however, two of the students were removed from the study. One student moved suddenly due to financial difficulties experienced by her family before the baseline phase. Another student suffered a
significant seizure that resulted in concerns about cognitive and motor functioning. The study design was not affected and data collection proceeded as proposed with two participants rather than four. Both of the participants were 17-year-old students enrolled in a suburban high school in Georgia who received special education services in a self-contained classroom for students with intellectual disabilities.

Raney is a 17-year-old Caucasian female with a diagnosis of microcephaly and moderate intellectual disabilities. Raney has received special education services since pre-school in the moderate intellectual disabilities program. Raney’s full scale IQ on the Wechsler Intelligence Scale for Children (Fourth edition) is 41, with Verbal Comprehension of 53, Reasoning of 49, Working Memory of 50, and Processing Speed of 50. Raney is described as a hard worker and has good behavior at school. She has no motor difficulties of note. Raney’s IEP focuses on daily living skills and vocational skills in the school and community settings.

Betsy is a 17-year-old African American female with a history of lead poisoning in early childhood that resulted in overall global developmental delays. Betsy has received special education services within the moderate intellectual disabilities program since elementary school. On the Universal Non-verbal Intelligence Test (UNIT), Betsy’s full scale IQ is a 41. On the Differential Ability Scale (DAS), her verbal score is a 59, her non-verbal reasoning is a 52, and her conceptual ability is reported as a 48. Betsy is reported to have good social skills but needs redirection and prompting to complete tasks. She also demonstrates weaknesses in the area of listening comprehension and memory. Betsy’s IEP focuses on activities of daily living and vocational skills in the school and community settings.
Setting

The study was conducted in a self-contained special education high school classroom for students with moderate or severe intellectual disabilities. The school is located in a North Metro Atlanta suburb. The screening, baseline, and intervention phases of the treatment were conducted within the designated vocational area of the classroom. The area was free from distraction. After intervention, the generalization phase was conducted in the school cafeteria. Individual instruction took place daily according to the classroom schedule for vocational training.

Instrumentation

A task analysis was developed by the researcher for the task of rolling silverware. This was done by identifying the target skill, identifying the pre-requisite skills of the learner and the materials needed, breaking the task into small parts, and confirming the task analysis was complete by having a separate individual follow the task analysis verbatim. This researcher tested the task analysis on both an adult and a 6-year-old child (the approximate developmental age of the students who participated in the study). The task analysis resulted in 15 steps in the task sequence, each of which was operationally defined (See Table 1).

Table 1

<table>
<thead>
<tr>
<th>Task Analysis Results for Rolling Silverware</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
</tr>
<tr>
<td>Step</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>4.</td>
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<tr>
<td>5.</td>
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<td>6.</td>
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<td>7.</td>
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<td>8.</td>
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<td>9.</td>
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<td>10.</td>
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<td>11.</td>
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<tr>
<td>12.</td>
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<tr>
<td>13.</td>
</tr>
<tr>
<td>14.</td>
</tr>
<tr>
<td>15.</td>
</tr>
</tbody>
</table>

A video was made from the learner’s perspective performing each step in the sequence. During the study, data were collected on each step as operationally defined, using the Task Analysis Recording Sheet (See Appendix B) for the assigned condition (i.e., video prompting alone or video prompting with a system of least-to-most prompting).

To assess intervention acceptability, or social validity, a survey was given to both the students and interventionists during the generalization phase (See Appendix C).

**Procedures**

IRB approval for the study was obtained in August of 2011 from Liberty University (See Appendix D). Approval was also obtained from the public school district used in this study in August of 2011 to elicit student participation and conduct the research study. The required protocol was followed with regard to subject participation.
agreements and consent (See Appendix E). Participants were identified by their inclusion in a high school classroom for students with moderate intellectual disabilities and then chosen for having IEP goals and objectives related to vocational tasks.

**Interventionist training**

The two interventionists were the classroom teacher and paraprofessional. Training was provided to the interventionists on the vocational task of rolling silverware and the operational definitions of each step in the task analysis as well as on the video prompting procedures for each condition, operation of the iPad®, and procedures for scoring. Additional training was provided on the least-to-most prompting method. Both the teacher and paraprofessional practiced each step involved in conducting the study. Practice sessions were video recorded and reviewed by the researcher and interventionists on a daily basis. Feedback was provided to the interventionists on program fidelity.

**Prompting skills priming/training evaluation**

Prior to beginning the study, the students who returned the permission form participated in a priming/screening session. The students viewed a practice video and three video clips on the iPad® depicting an action. Before viewing a clip, the students were told that after watching the video they would have to do what they saw on the screen. The videos used were as follows:

- **Practice Video** - a practice video clip (paired with a verbal prompt) from a subjective (i.e., learner’s) point of view showing an individual clapping hands.
- **Video 1** - a video clip (paired with a verbal prompt) from a subjective point of view showing an individual picking up a cup and turning it upside down on a table.
• Video 2 - a video clip (paired with a verbal prompt) from a subjective point of view showing an individual sorting two different colored straws into two different colored containers.
• Video 3 - a video clip (paired with a verbal prompt) from a subjective point of view depicting an individual folding three wash clothes.

At the end of each clip the interventionist asked the student to perform the action he or she just saw on the video clip. If the student did not respond or said he or she did not know, the student was allowed to watch the clip again. After a short practice, the student was evaluated using a prompting skills evaluation form (See Appendix F). For inclusion in the study, the student had to imitate the tasks on the clips in less than five trials per video. Both students who participated in the study completed the prompting skills within one trial without error.

**Target behaviors**

A task analysis of the steps required to roll silverware is included in Appendix A. Each of the 15 steps within the task analysis was operationally defined and then videotaped in sequenced clips showing the desired behavior and the correct performance of the step. The video was taken from a subjective point of view.

**Materials**

All video clips were filmed using an Olympus SP-800UZ digital camera recorded to a SanDisk SD card. Each clip consisted of a step within the task analysis and matched the operational definition as described. The clips were then sequenced and converted to a first generation iPad® compatible format using AVS video converter. The completed sequence was then imported into Keynote on the iPad®. The video clips were available
for viewing on an iPad® locked in a horizontal position and placed on a secure stand. The video was created with Piagetian principles of cognitive development in mind. Students with intellectual disabilities often function at a lower mental age than their chronological age. According to Weisz and Yeates (1981), individuals with intellectual disabilities often pass through the same cognitive developmental stages described by Piaget in an identical order to peers without intellectual disabilities, albeit at a slower rate. Typically, individuals with moderate intellectual disabilities perform at the preoperational stage. Therefore, video prompting needs to show concrete actions to follow, as was the case in the videos developed for the current study. If an individual is still functioning at the preoperational stage, perspective-taking is a problem. Thus, filming from the subjective point of view, as was done in the present study, was necessary (Weisz & Yeates, 1981).

Data Collection

Treatment groups

The participants were randomly assigned to either Treatment Group A - Video prompting only or Treatment Group B - Video prompting paired with a system of least-to-most prompting. Students’ names were put in a container and drawn by an individual not affiliated with the study.

Baseline phase

The baseline phase was identical for both treatment groups. To assess the level of performance during baseline, the researcher presented the student with the materials required to complete each step in the task analysis using a multiple opportunity method (Cooper, Heron, & Heward, 1987). The participant was verbally prompted to complete
the task (i.e., “Let’s roll silverware”) and given 5 seconds to respond. If the participant made an error that would prevent performance of the next response in the chain or if the participant made no response, the researcher completed the step. The participants did not receive any prompting, consequences, or feedback for performance during baseline. The participants were given a + or – for each step completed correctly. The baseline phase consisted of the pre-determined amount of five trials.

**Intervention**

**Research Question 1:** How effective is video prompting, presented via an iPad®, in facilitating the correct, independent completion of steps in rolling silverware by students with intellectual disabilities? This question was tested with Betsy, who was in Treatment Group A.

During the intervention, the trial began with a session that was identical to the baseline phase. Betsy viewed a video clip of a model performing the first step in the task of rolling silverware paired with a verbal prompt. The video clip automatically stopped after the first step. After viewing the first video clip, Betsy was instructed to complete the step as shown. Using the Task Analysis Recording Sheet (See Appendix B), the interventionist recorded a + for yes or – for a no if Betsy was able to complete a step of the rolling silverware task sequence following the video prompt, using the operational definitions for each step. If Betsy completed a step correctly, the interventionist verbally praised her and instructed her to advance the video clip. If Betsy did not complete a step correctly, did not respond within 5 seconds, or did not complete the step within a 15 second time frame, the session was terminated.
Sessions continued until Betsy could independently and accurately complete all 15 steps for two successive trials. The number of trials needed to achieve this with 100% accuracy, and thus end the intervention phase, was recorded as a dependent variable.

**Research Question 2:** How effective is video prompting, presented via an iPad® in combination with a system of least-to-most prompting, in facilitating the correct, independent completion of steps in rolling silverware by students with intellectual disabilities? This question was tested with Raney, who was in Treatment Group B.

During the intervention, the trial began with a session that was identical to the baseline phase. Raney then viewed the video clip of a model performing the first step in the task of rolling silverware paired with a verbal prompt. The video clip automatically stopped after the first step. After viewing the first video clip, Raney was instructed to complete the step as shown. If Raney completed the step as operationally defined, the interventionist verbally praised her and instructed her to advance the video clip. If Raney did not complete the step correctly, did not respond within 5 seconds, or did not complete the step within a 15 second time frame, the interventionist used the least-to-most prompting method (moving along a continuum) starting with a verbal prompt (V), then gestural (G), partial physical (PP), and finally full physical (FP) for the step to be completed. The level of prompt was recorded on the data sheet (See Appendix B).

Prompting needed for task completion was assessed using a 4-point scale rating the amount of prompting required for the task to be completed. A rating of 4 was given if Raney did not make any attempt to respond or required a full physical prompt to complete the task. A rating of 3 was given if Raney attempted to complete the step but did not do so correctly, requiring a partial physical prompt. A rating of 2 was given if
Raney completed the task correctly after the interventionist made a gestural prompt. A rating of 1 was given if Raney completed the task correctly after receiving a direct verbal prompt. A rating of 0 was given if Raney independently initiated the task and completed the step correctly within 5 seconds of viewing the video clip (L. Barry & Burlew, 2004).

The researcher utilized the prompting hierarchy to ensure each step in the task analysis was completed correctly before advancing to the next step. Percentages for levels of prompt required to complete the task were calculated by adding up the scores from each step in the task analysis, dividing by the number of points possible, and multiplying this number by 100. Sessions continued until Raney could accurately complete all 15 steps in the task analysis at the independent prompt level (i.e., score of 0) in two consecutive trials. The number of trials needed to achieve this at 100% accuracy, and thus end the intervention phase, was recorded as a dependent variable.

**Generalization and maintenance**

Generalization probes were conducted for both students in the high school cafeteria immediately following the demonstration of mastery on 100% of the 15 steps in order to determine whether the students could perform the task in another setting. The generalization sessions were conducted again at 1 week and 1 month after the conclusion of the intervention phase. If the students did not perform the task with 100% accuracy during any of the generalization probes, they were given an additional training session conducted in the training classroom setting. Maintenance probes were conducted 1 month after completing the study.
Social validity

Research Question 3: What are the perceptions of the participants and interventionists regarding the use of video prompting as an intervention with regard to acceptability and effectiveness in teaching individuals with intellectual disabilities the vocational task of rolling silverware? Upon completion of the study, participants and interventionists were given a social validity rating scale and spoke with the researcher (See Appendix C). Social validity is used to assess treatment acceptability and to document interventions that are related to change in socially important situations (Wolf, 1978). Social validity survey data were averaged across participants, analyzed, and reported as averages. Anecdotal information was also reported.

Internal Validity

By design, single subject research has high internal validity because participants serve as their own controls. However, when data collection relies on the interpretations of observers, safeguards must be in place to determine the reliability of these observations.

Inter-observer agreement

Kazdin (1983) defined inter-observer agreement as the degree to which two or more observers concur that a behavior has indeed occurred as operationally defined. In this study, inter-observer agreement checks were assessed at a minimum of 30% of the total performance observations and at least once in every condition (i.e., intervention, generalization, and maintenance) for each participant. A reviewer was trained on the operational definition of each step in the task analysis as well as data collection procedures and standards. The trained, independent reviewer observed sessions
conducted by the interventionists and rated each step performed. Inter-observer reliability data were calculated using the point-by-point method and dividing the total number of agreements plus disagreements and multiplying by 100 (Snell & Brown, 2000).

**Procedural fidelity**

Procedural fidelity data (Billingsley, White, & Munson, 1980) were collected by another independent reviewer to determine whether the procedures were implemented accurately and consistently across participants and conditions. The mean procedural fidelity across interventionists for each phase was assessed and expressed as a percentage of compliance with the described procedures. Procedural fidelity was calculated by dividing the number of observed steps by the number of prescribed steps and multiplied by 100.

**External Validity**

Applications of the results of this study to a realistic setting were assessed during the generalization phase and through a survey given to all participants (i.e., students and interventionists).

**Data Analysis**

The ability to roll silverware according to the guidelines set in the task analysis was the target behavior for this study. Data collected were analyzed visually and statistically for the baseline, intervention, and generalization stages. Conclusions on the effectiveness of the interventions are only drawn when reliable changes occur in the data when experimental conditions are implemented (Wolery & Dunlap, 2001). Social validity was based on surveys completed by both the interventionists and participants.
Research question 1

How effective is video prompting, presented via an iPad®, in facilitating the correct, independent completion of steps in rolling silverware by students with intellectual disabilities?

The percentage of steps in the task sequence completed correctly was calculated for each trial. The data were visually inspected and means and trends for each phase were compared. Visual analysis is a systematic process that evaluates the graphic representation of data that are continuously gathered during baseline and intervention conditions (Tankersley et al., 2008). According to Kazdin (1983), “Visual analysis refers to reaching a judgment about the reliability or consistency of intervention effects by visually examining graphed data” (p. 232). When utilizing visual analysis in single subject research, data are plotted on graphs and visually inspected. Visual analysis involves review of the level, trend, and variability within and across phases (R. D. Horner et al., 2005). According to Wolery and Harris (1982), researchers must visually inspect graphed data to interpret experimental effects. Data interpretation must establish that the data were reliably collected, whether there were changes within experimental conditions, and whether the changes that occurred between experimental conditions were related to manipulations. Single subject researchers must visually inspect graphed data to interpret experimental effects. A change in trend or direction of data as the intervention is implemented or withdrawn can help determine the effectiveness of an intervention.

Alberto and Troutman (2006) asserted that the effect of the intervention on the behavior is more definite when the time in which the change occurs is sooner rather than later. A two-proportion z test was conducted to determine whether there was a
statistically significant difference between treatment methods in the number of trials needed to reach 100% accuracy in rolling silverware.

**Research question 2**

How effective is video prompting, presented via an iPad® in combination with a system of least-to-most prompting, in facilitating the correct, independent completion of steps in rolling silverware by students with intellectual disabilities?

The percentage of steps in the task sequence completed correctly was calculated for each trial. The data were visually inspected, and trends for each phase were compared. A two-proportion z test was conducted to determine whether there was a statistically significant difference between treatment methods in the number of trials needed to reach 100% accuracy in rolling silverware.

**Research question 3**

What are the perceptions of the participants and interventionists regarding the use of video prompting as an intervention with regard to acceptability and effectiveness in teaching individuals with intellectual disabilities the vocational task of rolling silverware?

Ultimately, the goal of the research was to demonstrate effective instructional strategies that can be utilized when teaching individuals with disabilities vocational tasks. As such, the satisfaction of participants and interventionists with the use of video technology was important to determine. To assess intervention acceptability, or social validity, a survey was given to both the students and interventionists during the generalization phase. The students’ survey had simple statements with which they could agree or disagree (See Appendix C). The questions were read to them and they were asked to point to or circle a smiley face or unsmiling face to indicate whether they agreed
or disagreed. This type of response system is routinely used within this particular classroom. Interventionists were given a 7-question survey that required them to respond on a Likert scale (See Appendix C). Responses were recorded as the mean for each question. Additional narrative comments reported by both participants and interventionists were also analyzed for important themes.
CHAPTER FOUR: RESULTS

In order to evaluate the effectiveness of video prompting delivered via an iPad® in combination with a system of least-to-most prompting to teach individuals with intellectual disabilities the vocational task of rolling silverware, a single subject research design was utilized. Results of the examination of the internal validity issues of inter-observer agreement and procedural fidelity are presented first, followed by the results of each research question. Data regarding the use of the iPad®, with or without least-to-most prompting, were analyzed visually and statistically, with reliable changes in the data noted when experimental conditions were implemented (Wolery & Dunlap, 2001). Results of the examination of external, or social, validity are presented from the generalization stage as well as from an analysis of the responses to participant surveys.

Inter-observer Agreement

Inter-observer agreement checks were conducted by a trained, independent reviewer on at least 30% of each participant’s sessions and at least once in every condition (i.e., baseline, intervention, generalization, and maintenance) for each participant. Inter-observer agreement, or reliability, is defined as whether agreement or disagreement occurred when two separate individuals observed a step in the task of rolling silverware. Inter-observer reliability is based on the principle of direct observation of behavior and the agreement of others in that direct observation (Watkins & Pacheco, 2000). Table 2 reports the mean percentage of inter-observer agreement. Thirteen out of the 36 sessions (36%) for Treatment Group A (Betsy; video prompting alone) were checked for inter-observer agreement, and 11 out of the 31 sessions (35.5%) were checked for Treatment Group B (Raney; video plus least-to-most prompting) for
agreement..

Table 2

*Mean and Range of Inter-observer Agreement*

<table>
<thead>
<tr>
<th></th>
<th>Mean (%)</th>
<th>Range (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Betsy (N = 13)</td>
<td>98.2</td>
<td>89.7-100</td>
</tr>
<tr>
<td>Raney (N = 11)</td>
<td>99.1</td>
<td>92.1-100</td>
</tr>
</tbody>
</table>

**Procedural Fidelity**

To obtain procedural fidelity data, another trained independent reviewer completed a data collection form to ensure compliance. Data were collected for a minimum of 30% of the sessions with each participant. The form listed a description of the action to be performed and was scored using a “yes” for correct implementation of the task and a “no” for incorrect implementation of the task. A percentage was reached by dividing the total of yes responses by the total number of actions performed. The overall procedural integrity scores across all observed sessions was a mean of 98% with a range of 96% to 100%. The results indicate the intervention was implemented with a high level of procedural integrity.

**Research Questions 1 and 2**

Research Question 1 was: How effective is video prompting, presented via an iPad®, in facilitating the correct, independent completion of steps in rolling silverware by students with intellectual disabilities?

Research Question 2 was: How effective is video prompting, presented via an iPad® in combination with a system of least-to-most prompting, in facilitating the correct, independent completion of steps in rolling silverware by students with
intellectual disabilities?

**Video prompting only**

During baseline, Betsy was given the verbal prompt and materials to roll silverware. She made an attempt but failed to complete any of the steps correctly over the five baseline trials. During intervention, Betsy began with a session identical to the baseline phase. Betsy then viewed the video clip of a model performing the first step in the task of rolling silverware paired with a verbal prompt. Within five video prompting only sessions, Betsy was able to complete five of the 15 steps (33%) correctly for rolling silverware and increased her accuracy with each additional session. Within 15 intervention sessions, Betsy was completing 67% of the steps correctly. The trend continued until she reached 100% accuracy by session 25 over two consecutive sessions. Eighty-nine to 100% accuracy was maintained through the generalization phase. At maintenance, Betsy’s completions were constant at 100% (See Figure 1).
Video plus least-to-most prompting

During baseline, Raney was given the verbal prompt and materials to roll silverware. She made an attempt but failed to complete any of the steps correctly over the five baseline trials. During the intervention phase, Raney began with a session that was identical to the baseline phase. Raney then viewed the video clip of a model performing the first step in the task of rolling silverware paired with a verbal prompt.

Upon implementation of the video prompting and a least-to-most prompting intervention, Raney’s percent of completions began at 53% (eight of the 15 steps) and reached 100% by trial 13. At generalization, Raney’s percent of completions ranged from 78% to 100%. At maintenance, Raney’s completions were constant at 100% (See Figure 2).
Figure 2. Raney video plus least-to-most prompting.

Statistical analysis

In addition to the visual analysis conducted to explore Research Questions 1 and 2, means and standard deviations were conducted on the independent completion of the steps in silverware rolling. The numbers presented are in the form of percentages to indicate the percent of steps independently completed at each stage (i.e., baseline through maintenance). Betsy received video prompting only via an iPad® and Raney received video prompting paired with the least-to-most prompting method via an iPad®. At baseline, for both Betsy and Raney, percent of completions remained constant at 0%. At intervention, Betsy’s percent of completions ranged from 22% to 100%, while Raney’s percent of completions ranged from 53% to 100%. During generalization, Betsy’s percent of completions ranged from 89% to 100% and Raney’s ranged from 78% to
100%. At maintenance, both Betsy and Raney remained stable at 100%. Means and standard deviations of the percent of steps completed independently over the trials at each stage of the research are presented in Table 3.

Table 3

*Means and Standard Deviations for Independent Completion of Steps by Participant at Each Time*

<table>
<thead>
<tr>
<th>Time</th>
<th>Raney*</th>
<th></th>
<th>Betsy</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$M$</td>
<td>$SD$</td>
</tr>
<tr>
<td>Baseline</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Intervention</td>
<td>88.25</td>
<td>16.52</td>
<td>55.05</td>
<td>27.73</td>
</tr>
<tr>
<td>Generalization</td>
<td>95.44</td>
<td>7.37</td>
<td>98.17</td>
<td>4.49</td>
</tr>
<tr>
<td>Maintenance</td>
<td>100.00</td>
<td>0.00</td>
<td>100.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

*Note.* * Indicates participant who received least-to-most video prompting.

To further assess Research Questions 1 and 2, a two proportion $z$ test was conducted to determine whether there was a statistically significant difference between video prompting methods in the number of trials needed to reach independent completion on 100% of the steps in rolling silverware. For a student to have been considered as reaching 100% completion, she needed to independently complete all 15 silverware rolling steps in at least two consecutive trials. Betsy reached 100% at attempt 23 and 24; for Betsy, attempt 25 was considered the point at which she achieved completion. Raney reached 100% at attempt 13 and 14; for Raney, attempt 15 was considered the point at which she achieved completion.

The result of the two-proportion $z$ test was statistically significant, $z = 2.67$, $p = .008$, indicating there were differences in the amount of time it took each student to
achieve completion. Raney achieved completion \( (n = 15) \) in significantly fewer attempts than Betsy \( (n = 25) \). Results of the \( z \) test are presented in Table 4.

Table 4

Two-proportion \( z \) Test to Assess Differences in Time of Completion Between Students

<table>
<thead>
<tr>
<th>Variable</th>
<th>Raney*</th>
<th>Betsy</th>
<th>( z )</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trial at which independent completion was achieved</td>
<td>15</td>
<td>25</td>
<td>2.67</td>
<td>.008</td>
</tr>
</tbody>
</table>

* Indicates participant who received least-to-most video prompting.

Research Question 3

Research Question 3 was: What are the perceptions of the participants and interventionists regarding the use of video prompting as an intervention with regard to acceptability and effectiveness in teaching individuals with intellectual disabilities the vocational task of rolling silverware?

At the conclusion of the study, social validity data were collected from participants and interventionists to determine their overall satisfaction with the video prompting intervention (See Appendix C). The survey used for the participants was modified to a simple 5-question format that was read aloud to them. The survey asked the participants to indicate by pointing to or circling a smiley face or unsmiling face to indicate their answer. Both participants chose all smiley faces regarding the statements. Additional comments were, “it was easy” and “it was fun.” Betsy and Raney indicated they liked the video sessions and thought watching the video on the iPad® was easy. Both participants indicated they liked learning by watching the video and they would like to do it again.
The interventionists were given a 7-question Likert-type survey to indicate their agreement or disagreement with the statements. Social validity data from the research assistants were analyzed descriptively. The responses were averaged and are presented in Table 5.

### Table 5

**Interventionist Social Validity Questions Mean Responses**

<table>
<thead>
<tr>
<th>Question</th>
<th>Mean</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. This intervention was appropriate to use to teach a vocational task.</td>
<td>4.7</td>
<td>4-5</td>
</tr>
<tr>
<td>2. I was willing to carry out this intervention.</td>
<td>4.7</td>
<td>4-5</td>
</tr>
<tr>
<td>3. The cost, training, and implementation of this type of intervention involved appear to be minimal.</td>
<td>3.6</td>
<td>3-4</td>
</tr>
<tr>
<td>4. The participant appeared to enjoy the intervention.</td>
<td>4.7</td>
<td>4-5</td>
</tr>
<tr>
<td>5. This intervention is likely to improve vocational skills for students with moderate intellectual disabilities.</td>
<td>3.6</td>
<td>3-4</td>
</tr>
<tr>
<td>6. I could see this intervention being implemented in a variety of training settings.</td>
<td>4.0</td>
<td>3-5</td>
</tr>
<tr>
<td>7. I am confident that this intervention was effective.</td>
<td>3.6</td>
<td>3-4</td>
</tr>
</tbody>
</table>

Additional anecdotal information was also encouraged. Both indicated they thought training students on the vocational task of rolling silverware by using video modeling via the iPad® an effective way to teach a vocational task. One comment was that it was nice to see the kids doing something like the other high school students as far as interacting with technology. The interventionists also reported they thought the participants enjoyed using the iPad® as they were willing and eager to begin the sessions and often asked about it during the school day. One of the interventionists reported Raney was often very negative (i.e., complaining about) work related tasks prior to
participating in the study. The interventionist noted Raney was very excited about her work sessions every day and kept asking if she could do it again. The portability, ease of use, and social acceptability of having a tablet or iPad® out in public were listed in the comment section as both age and socially appropriate. Interventionists also said they thought video prompting was particularly useful with this age group as far as being highly motivating. During the generalization phase, passers-by in the lunchroom (i.e., teachers and students alike) stated they thought it was really “neat” that the participants were using technology in such a manner (i.e., as training tools for students with intellectual disabilities).
CHAPTER FIVE: DISCUSSION

Individuals with intellectual disabilities have a greater chance of being successful in their lives if they develop some independent job skills (Pierce & Schreibman, 1994). Adults with intellectual disabilities often struggle to find employment opportunities throughout their lifetime. A successful transition from the instructional setting to the vocational setting is an essential part of the ability of students with intellectual disabilities to gain employment and vocational training within secondary schools should be an integral part of the curriculum focus (McCrea & Miller, 1999).

The primary purpose of this study was to determine the effectiveness of the use of video prompting presented via an iPad® in facilitating the correct, independent completion of steps in rolling silverware by students with intellectual disabilities. Furthermore, the question of whether video prompting in combination with a system of least-to-most prompting is more effective than video prompting alone was examined. This chapter includes current findings, limitations to the study, implications for future research, and implications for practitioners in the field of special education.

Although previous research has shown both least-to-most prompting and video prompting to be effective in teaching students with intellectual disabilities a wide range of skills, combining the two procedures as a treatment package has not been thoroughly examined. The use of an iPad® as a delivery system has also not been explored.

Current Findings

The findings from this study support the use of video prompting delivered via an iPad® to increase the correct independent responding of individuals with moderate intellectual disabilities on the vocational task of rolling silverware. Additionally,
findings support the pairing of a system of least-to-most prompting with video prompting. This study showed that although both were effective, using the system of least-to-most prompting in conjunction with video prompting resulted in acquisition of skills in fewer trials than video prompting alone.

Data indicate video prompting and video prompting paired with a system of least-to-most prompting were effective to teach students with intellectual disabilities the vocational task of rolling silverware. Performance levels prior to intervention were 0% for both participants. When video prompting was introduced, performance levels increased for both participants.

*Betsy.* Upon visual inspection, it was evident that the introduction of the video prompt during intervention, lead to Betsy being able to complete five of the 15 steps (33%) correctly within five sessions. The trend continued until she reached 100% accuracy by session 25 over two consecutive sessions. At maintenance, Betsy’s completion rate was constant at 100%.

*Raney.* Upon implementation of the video prompting paired with the least-to-most prompting method, Raney completed eight of 15 steps (53%) within the first trial and reached 100% by trial 13.

Although both interventions were effective, video prompting paired with a system of least-to-most prompting led to a quicker acquisition of the skill and required fewer sessions to reach criterion. Additionally, performance of the skill in the generalization and maintenance phases was more consistently close to 100% independent completion for Raney, who received video plus least-to-most prompting.
The use of video prompting and video prompting paired with a system of least-to-
most prompting is based on utilizing task analysis, repetition, and corrective feedback
which have all been shown to help individuals with developmental disabilities acquire
skills (Giangreco, 2011; Snell, 2007).

The body of research that exists on using video modeling to teach a wide range of
skills to individuals with intellectual disabilities and autism is growing. Research on the
use of video modeling has increased over the past several years, as manipulation of
digital media has become more mainstream and devices have become more portable and
inexpensive. As such, opportunities for application outside of the classroom continue to
emerge. Cihak et al. (2009) demonstrated video technology can effectively deliver
instruction to individuals with intellectual disabilities on a wide range of skills. The body
of research is much smaller on the type of device that the video prompting is presented on
(Sigafoos et al., 2007;) therefore, there is a need to evaluate the effectiveness of this
technology in conjunction with other instructional methods and in other types of
presentation formats. This study begins to fill the gap in the literature.

Because existing research shows lack of experience and job training to be major
barriers for individuals with disabilities in securing employment (Loprest & Maag, 2001),
teaching skills that can help increase the employability of these individuals is of great
value. Video prompting can help facilitate this task. In addition, the method of least-to-
most prompting when teaching vocational skills allows for an individual to attempt a
response with the least amount of assistance required for correct completion by providing
assistance along a continuum to elicit a correct response (Cooper et al., 1987). Although
both video prompting and the use of a least-to-most prompting system appear in the literature, combining the two to augment the skill has received minimal exploration.

The current study adds to the existing body of research on video modeling by not only investigating the effectiveness of using video prompting to teach the vocational task of rolling silverware to individuals with moderate intellectual disabilities, but by also examining the addition of the system of least-to-most prompting to augment the acquisition of the vocational task of rolling silverware. The finding that least-to-most prompting resulted in acquisition of skills in fewer trials than video prompting alone can help make job skills training more efficient.

The utilization of an iPad® in the current study was also unique, as many prior studies utilized a laptop or TV/VCR display. Stock, Davies, Davies, and Wehmeyer (2006) identified many of the limitations faced by individuals with intellectual disabilities in the operation of a PDA used as a video prompting tool. Van Laarhoven et al. (2009) found the video iPod® had a much less complex user interface than handheld PDAs that were used in other studies. The iPod®, and by extension the iPad®, addresses many of the noted deficits in PDAs. The quality of the high-definition video is crisp, clear, and visually appealing. Additionally, the iPad® is more portable than a laptop computer, without sacrificing video quality.

Knowledge that an iPad® can effectively train individuals with moderate intellectual disabilities on vocational skills, as discovered in the current study, is quite useful. As indicated by responses to the social validity survey, an iPad® is a very natural, socially acceptable support in any setting, and students with intellectual
disabilities find it “easy” and “fun” to use. Furthermore, the iPad® can easily be used to retrain someone who might need a refresher by efficiently re-showing the original video.

Implications for Practice

An important implication for this study for practitioners is the short amount of time that it took for criterion to be reached on the vocational task of rolling silverware by Raney and Betsy. Although video prompting paired with the system of least-to-most prompting resulted in faster acquisition of the skill, both were effective in terms of being able to independently complete the task. Video prompting alone did not require the prompting support of the teacher and could be used as the next best intervention. A suggestion would be for video modeling alone to be implemented and should the student note make adequate progress in a set amount of time, the system of least-to-most prompting could be added to augment the skill. Teachers continually have to balance instructional scheduling and the needs of their students. Both video modeling alone and video modeling paired with a system of least-to-most prompting accomplish the goal of teaching the vocational task and allow for flexibility in the amount of support needed resulting a very practical teaching intervention.

This study assessed both generalization and social validity, however, in a 2011 review of video prompting studies with persons with developmental disabilities conducted by Banda, Dogoe, and Matuszny, found that of that only five of 18 studies reviewed assessed generalization of the skill to other settings. Generalization of a skill from one setting to another is often difficult for individuals with intellectual disabilities. It is important for practitioners to provide training in other settings and assess the ability to generalize the skill. Banda, Dogoe, and Matuszny (2011) also reported that social
validity was assessed in only four of the 18 studies they reviewed. Social validity data is a critical piece in special education research when trying to determine the ease of implementing an intervention and the overall satisfaction from interventionists and participants.

**Limitations**

The results of this study should be interpreted with an understanding of the study’s limitations. The small sample size warrants caution for generalizability, or external validity, although single subject case studies are a common method employed in special education research. The current study was originally designed to include four participants, but due to circumstances beyond the researcher’s control, only two individuals with intellectual disabilities participated. A larger number and wider variety of participants would increase generalizability to the population of individuals with intellectual disabilities.

However, the fact that the two individuals who did participate in the study were somewhat homogenous in intellect (i.e., moderately intellectually disabled with IQs in the same range) and motoric ability (i.e., not affected by IQ) contributes to the internal validity of the study. Because the individuals were randomly assigned to the treatment groups, a quasi-experimental design was simulated. This helped internal validity by reducing participant differences as causes for vocational skill improvement, thus making a stronger argument for intervention (i.e., video prompting plus least-to-most prompting) as an influence on skill performance.

Because rolling silverware requires some dexterity, other vocational tasks that are easier might apply to a wider group of individuals with intellectual disabilities. The
variability in the difficulty of different vocational tasks typically done by this population makes it hard to gauge the effectiveness of the intervention in broad terms.

Another limitation to the generalizability of the study is the use of only one vocational task (i.e., rolling silverware) rather than a treatment package that addressed several vocational tasks. Future studies should investigate whether results differ based on the type of vocational task being taught through video prompting and least-to-most prompting.

A limitation to the replication of the study is the complex act of creating the prompting videos. Although this researcher was able to design, develop, and implement the video for use, there were some more technical components that some people without advanced video editing experience might find challenging.

A possible limitation to the internal validity of the study is the fact that one of the interventionists was a paraprofessional who had worked with both of the students for over 2 years. The relationship between the students and the paraprofessional might have influenced their responding. However, a high inter-observer agreement on performance observations helped mitigate this concern.

**Future Research**

The body of research investigating the use of video prompting is growing. During the course of the present study, several upgrades to the iPad® were released to the market. Other brands of tablet devices also were also released, and the price of this technology has decreased dramatically. Future researchers could investigate the generalizability of learning a vocational task from an iPad® to other types of tablet devices. Future researchers should also investigate whether screen size (e.g., iPad® vs.
iPad® Mini vs. iPod®) is relevant when utilizing a video prompting treatment package.

In addition to exploring the effects of the medium by which the video is presented, future researchers should explore the effectiveness of video prompting or least-to-most prompting with other vocational tasks. Finally, including students with more severe intellectual disabilities as well as students with autism in future studies could provide additional information for practitioners when utilizing this type of intervention.

Further researchers could also compare the effectiveness of video prompting between individuals with a primary diagnosis of intellectual disability compared to individuals with a primary diagnosis of autism.

**Conclusion**

As technology continues to expand and provide more options for people, individuals with disabilities can expect to see features that could reduce limitations related to accessibility and create learning opportunities for them. Touch screens and camera’s on the front and back of devices as well as emerging special education software, might be able to help individuals with disabilities acquire, practice and retain skills without the assistance of a teacher. This study works towards that goal.

There are several reasons video prompting is a promising intervention for practitioners. Video prompting can be used in multiple settings and used as often as needed for the individual to learn the targeted skill. Once the video is completed, it can be used to teach other students. This adds to support for the efficacy of the use of video prompting (McCoy & Hermansen, 2007). The use of prompting is a good alternative for a live model and the instruction can be precisely replicated each time. This would be very difficult to do with a live model (Ayres & Langone, 2005). Another reason video
prompting is a promising intervention is that staff might not require the amount of training that they would otherwise need to conduct live instruction (Sherer et al., 2001). This could be an important factor considering limited time for staff training that many districts experience.

This study contributes to the body of literature and provides support for using video prompting and video prompting paired with a system of least-to-most prompting to teach students with moderate intellectual disabilities the vocational task of rolling silverware. The positive outcome of the current study suggests video prompting paired with a system of least-to-most prompting is more effective than video prompting alone. However, the use of an iPad® for video prompting resulted in both participants learning a new vocational skill and is therefore a promising strategy that warrants further exploration within the field of special education.
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doi:10.1177/00224669970310010

## APPENDIX A: OPERATIONAL DEFINITIONS

<table>
<thead>
<tr>
<th>Task Analysis</th>
<th>Operational Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pick up napkin</td>
<td>Picks up napkin from stack</td>
</tr>
<tr>
<td>2. Place napkin in front of you</td>
<td>Lays napkin down flat in triangle</td>
</tr>
<tr>
<td>3. Fold napkin in half</td>
<td>Fold napkin corner to corner to form triangle</td>
</tr>
<tr>
<td>4. Turn napkin</td>
<td>Turn napkin so long end is closest to you</td>
</tr>
<tr>
<td>5. Pick up knife</td>
<td>Takes knife from bin</td>
</tr>
<tr>
<td>6. Place knife on napkin</td>
<td>Knife is placed long ways on napkin</td>
</tr>
<tr>
<td>7. Pick up fork</td>
<td>Takes fork from bin</td>
</tr>
<tr>
<td>8. Place fork on napkin</td>
<td>Fork is placed on top of knife in same direction</td>
</tr>
<tr>
<td>9. Pick up second fork</td>
<td>Takes second fork from bin</td>
</tr>
<tr>
<td>10. Places second fork on napkin</td>
<td>Places second fork top of fork 1 and knife</td>
</tr>
<tr>
<td>11. Roll napkin two turns</td>
<td>Roll napkin and silverware two turns</td>
</tr>
<tr>
<td>12. Stop</td>
<td>Student stops rolling</td>
</tr>
<tr>
<td>13. Fold left side of napkin in</td>
<td>Folds left side corner of napkin in half way</td>
</tr>
<tr>
<td>14. Fold right side of napkin in</td>
<td>Folds right side corner of napkin in half way</td>
</tr>
<tr>
<td>15. Roll to end</td>
<td>Rolls to end</td>
</tr>
</tbody>
</table>
APPENDIX B: DATA COLLECTION SHEETS

Treatment Group A- Data Collection Sheet

Student: ______________________

Instructor: _____________________

Date: _________________________

Observer: ______________________

Group A

Steps:
1. Pick up napkin
2. Place napkin in front of you
3. Fold napkin in half
4. Turn napkin
5. Pick up knife
6. Place knife on napkin
7. Pick up fork
8. Place fork on napkin on knife
9. Pick up fork
10. Place fork on top of other fork
11. Roll napkin two turns
12. Stop
13. Fold napkin side in
14. Fold other napkin side in
15. Roll to end

Dates**
Treatment Group B- Data Collection Sheet

Student: __________________________
Instructor: __________________________
Date: __________________________
Observer: __________________________

KEY:  0. Independent (I)
       1. Verbal prompt (V)
       2. Gestural (G)
       3. Partial physical prompt (PP)
       4. Full physical prompt (FP)

Steps:

<table>
<thead>
<tr>
<th>Steps</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pick up napkin</td>
<td></td>
</tr>
<tr>
<td>2. Place napkin in front of you</td>
<td></td>
</tr>
<tr>
<td>3. Fold napkin in half</td>
<td></td>
</tr>
<tr>
<td>4. Turn napkin</td>
<td></td>
</tr>
<tr>
<td>5. Pick up knife</td>
<td></td>
</tr>
<tr>
<td>6. Place knife on napkin</td>
<td></td>
</tr>
<tr>
<td>7. Pick up fork</td>
<td></td>
</tr>
<tr>
<td>8. Place fork on napkin on knife</td>
<td></td>
</tr>
<tr>
<td>9. Pick up fork</td>
<td></td>
</tr>
<tr>
<td>10. Place fork on top of other fork</td>
<td></td>
</tr>
<tr>
<td>11. Roll napkin two turns</td>
<td></td>
</tr>
<tr>
<td>12. Stop</td>
<td></td>
</tr>
<tr>
<td>13. Fold napkin side in</td>
<td></td>
</tr>
<tr>
<td>14. Fold other napkin side in</td>
<td></td>
</tr>
<tr>
<td>15. Roll to end</td>
<td></td>
</tr>
</tbody>
</table>

Dates**
APPENDIX C: SOCIAL VALIDITY SURVEYS

Instructor Social Validity Survey

1. This intervention was appropriate to use to teach a vocational task.

   Strongly disagree    Strongly agree

2. I was willing to carry out this intervention.

   Strongly disagree    Strongly agree

3. The cost, training and implementation of this type of intervention involved appears to be minimal.

   Strongly disagree    Strongly agree

4. The participant appeared to enjoy the intervention.

   Strongly disagree    Strongly agree

5. This intervention is likely to improve vocational skills for students with moderate intellectual disabilities.

   Strongly disagree    Strongly agree

6. I could see this intervention being implemented in a variety of training settings.

   Strongly disagree    Strongly agree

7. I am confident that this intervention was effective.

   Strongly disagree    Strongly agree
Participant Modified Social Validity Scale

Social Validity Form

1. I like the video sessions.

2. Watching the video on the iPad® was easy.

3. I like learning by watching a video.

4. I want to learn more things using the iPad®.

5. I would like to do this again.
APPENDIX D: IRB APPLICATION

Ref. # ______________

APPLICATION TO USE HUMAN RESEARCH SUBJECTS

Liberty University

Committee On The Use of Human Research Subjects

1. Project Title The use of video prompting delivered via an iPad® in combination with a system of least-to-most prompting to teach individuals with intellectual disabilities the vocational task of rolling silverware.

2. Full Review [ ] Expedited Review [X]

3. Funding Source (State N/A if not applicable): N/A

4. Principal Investigator:
   Kelly F. Williams
   Kwilliams6@liberty.edu
   Name and Title
   404-545-9872, 

5. Faculty Sponsor (if student is PI), also list co-investigators below Faculty Sponsor, and key personnel:

   Dr. Kenneth Gossett, Dissertation Chair
   kjdgossett@liberty.edu
   320-743-6896

6. Non-key personnel:
   Dr. Jessica Talada, committee member
   javanderpool@liberty.edu
   434-582-2445

   Dr. Kathleen Chara
   drkathleenchara@gmail.com
   651-636-5549

7. Consultants:
   Dr. Judy Shoemaker
   jshoemaker@liberty.edu

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8. The principal investigator agrees to carry out the proposed project as stated in the application and to promptly report to the Human Subjects Committee any proposed changes and/or unanticipated problems involving risks to subjects or others participating in approved project in accordance with the Liberty Way and the Confidentiality Statement. The principal investigator has access to copies of 45 CFR 46 and the Belmont Report. The principal investigator agrees to inform the Human Subjects Committee and complete all necessary reports should the principal investigator terminate University association. Additionally s/he agrees to maintain records and keep informed consent documents for three years after completion of the project even if the principal investigator terminates association with the University.

________________________________________
________________________________________
Principal Investigator Signature Date

______Kenneth

Faculty Sponsor (If applicable) Date

Submit the original request to: Liberty University Institutional Review Board, CN Suite 1582, 1971 University Blvd., Lynchburg, VA 24502. Submit also via email to irb@liberty.edu

APPLICATION TO USE HUMAN RESEARCH SUBJECTS

10. This project will be conducted at the following location(s): (please indicate city & state)
- Liberty University Campus
- Other (Specify): Archer High School, Lawrenceville, Georgia 30045

11. This project will involve the following subject types: (check-mark types to be studied)
- Normal Volunteers (Age 18-65)
- Subjects Incapable Of Giving Consent
In Patients
Prisoners Or Institutionalized
Out Patients
Patient Controls
Fetuses
Minors (Under Age 18)
Over Age 65
University Students (PSYC Dept. subject pool ___)
Cognitively Disabled
Other Potentially Elevated
Physically Disabled
Pregnant Women

12. Do you intend to use LU students, staff or faculty as participants in your study? If you do not intend to use LU participants in your study, please check “no” and proceed directly to item 13.

YES □  NO X□

If so, please list the department and/classes you hope to enlist and the number of participants you would like to enroll.

________________________________________

In order to process your request to use LU subjects, we must ensure that you have contacted the appropriate department and gained permission to collect data from them.

Signature of Department Chair:

________________________________________

Department Chair Signature(s) Date

13. Estimated number of subjects to be enrolled in this protocol: 6

14. Does this project call for: (check-mark all that apply to this study)

□ Use of Voice, Video, Digital, or Image Recordings?
□ Subject Compensation? Patients $_____ Volunteers $_____
□ Participant Payment Disclosure Form
□ Advertising For Subjects? □ More Than Minimal Risk?
□ More Than Minimal Psychological Stress? □ Alcohol Consumption?
15. This project involves the use of an **Investigational New Drug** (IND) or an **Approved Drug For An Unapproved Use**.
   - [ ] YES  [X] NO
   - Drug name, IND number and company:  N/A

16. This project involves the use of an **Investigational Medical Device** or an **Approved Medical Device For An Unapproved Use**.
   - [ ] YES  [X] NO
   - Device name, IDE number and company:  N/A

17. The project involves the use of **Radiation or Radioisotopes**:
   - [ ] YES  [X] NO

18. Does investigator or key personnel have a potential conflict of interest in this study?
   - [ ] YES  [X] NO

**EXPEDITED/FULL REVIEW APPLICATION NARRATIVE**

**A. PROPOSED RESEARCH RATIONALE** The purpose of this study is to examine the effectiveness of the use of video modeling presented via an iPad® in conjunction with a system of least to most prompting to teach a vocational task (rolling silverware) to students with moderate intellectual disabilities. This study offers the potential to create a self-sustaining support specific to a job when an individual might need repetitive training both in the educational setting and on vocational job sites.
SPECIFIC PROCEDURES TO BE FOLLOWED

After obtaining consent from the student’s parent or guardian, students selected will participate in a priming/screening session. The student will view 3 video clips on the iPad® depicting an action. Before viewing the clip, the student would be told that after watching the video, they would have to do what they saw on the screen.

Video 1 - a video clip (paired with a verbal prompt) from a subjective point of view showing an individual picking up a cup and turn it upside down on the table (this is attached to the application as a sample for review).

Video 2 - a video clip (paired with a verbal prompt) from a subjective point of view showing an individual sorting 2 different colored straws into 2 different colored containers.

Video 3 - a video clip (paired with a verbal prompt) from a subjective point of view) depicting an individual folding 3 wash clothes.

At the end of each clip an instructor, with whom the student is familiar, will ask the student to perform the action that they just saw on the video clip. If the student does not respond or says they do not know, they can watch the clip again. After a short practice the student will be evaluated using a prompting skills evaluation form. The student must be able to imitate the tasks on the clips to participate in the study in less than 5 trials. The participants will be randomly assigned to either Treatment Group A or Treatment Group B. The baseline phase will be identical for both groups. Student’s names will be put in a container and drawn by an individual not affiliated with the study.

Baseline phase. To assess the level of performance during baseline, the researcher will present the student with the materials required to complete each step in the task analysis using a multiple opportunity method. The participant will be verbally prompted to complete the task (“Let’s roll silverware”) and given 5s to respond. If the participant makes an error that would prevent performance of the next response in the chain, or if the participant made no response, the researcher will complete the step. The participant will not receive any prompting, consequences or feedback for performance during baseline. The participant will be given a + or – for each step completed correctly.

Intervention Phase. During the intervention phase, each session will begin with a session that is identical to the baseline phase. The student will then view a video clip of a model performing the first step in the task of rolling silverware paired with a verbal prompt. The video clip will automatically stop after the first step. After viewing the first video clip, the student will complete the step as shown. If the student completes the step correctly, the instructor will verbally praise the student and the instructor will instruct the student on how to advance the video clip. If the student does not complete the step correctly, does not respond within 5s, or does not complete the step within a 15s time frame, the instructor will use the least-to-most prompting method (moving along a
continuum) starting with a verbal prompt (V), then gestural (G), partial physical (PP) and finally full physical (FP) for the step to be completed. Prompting needed for task completion will be assessed using a 5-point scale rating the amount of prompting required for the task to be completed. A rating of 5 will be given if the participant does not respond to all or requires a full physical prompt to complete the task. A rating of 4 will be given if the student attempts to complete the step but did not do so correctly requiring a partial physical prompt. A rating of 3 will be given if the student completes the task correctly after the teacher makes a gestural prompt. A rating of 2 will be given if the student completes the task correctly after receiving a direct verbal prompt. A rating of 1 will be given if the student independently initiates the task and completes the step correctly within 5s of viewing the video clip. The researcher will utilize the prompting hierarchy to ensure that each step in the task analysis is completed correctly before advancing to the next step. Percentages for levels of prompt required to complete the task will be calculated by adding up the scores from each step in the task analysis, dividing by the number of points possible and multiplying by this number by 100. The participant will have met criterion when all steps in the task analysis are completed at the independent prompt level in 3 consecutive training sessions.

**Generalization.** Generalization probes will be conducted in a vocational setting where the task would typically be performed (a restaurant or dining hall) immediately following the student demonstrating mastery on 100% of the steps involved in the task. If the student does not perform the task with 100% accuracy, the student will have an additional session conducted in the training setting.

**Maintenance.** Maintenance probes will be conducted two weeks after the establishment of criterion performance. Maintenance probes will be conducted in the vocational setting.

C. **SUBJECTS**

Who do you want to include in your study? Please describe in nonscientific language:

- Both male and female students ranging in age from 14-22 year old students at Archer High School currently being served in a classroom for students with moderate intellectual disabilities. Students will be selected based on identified Individualized Educational Program (IEP) objectives in the area of vocational skills that are within their current IEP and developed by and IEP team. These goals will be provided by the teacher of students with moderate intellectual disabilities at Archer High School. Students will be screened and primed for prerequisite skills such as visual attention, the ability to follow a video model, and required motor planning skills on an unrelated task using a video prompting evaluation assessment prior the participating in the study. Consent will be obtained from the parents or guardian before any contact is made with the students.
● Students that do not have the visual attention skills or the ability to follow a video model will be excluded from the study. Students that do not want to participate or do not obtain consent from their parents will be excluded as well.

● This study will investigate the effectiveness of video prompting with student with moderate intellectual disabilities. This type of intervention is appropriate for this population of students.

● The maximum number of students that will participate in the research study will be 6.

D. RECRUITMENT OF SUBJECTS AND OBTAINING INFORMED CONSENT

● Principal investigator will contact the teacher of students within the self-contained classroom for students with moderate disabilities for a list of possible participants. The teachers classroom is located within the same hallway within Archer High School and contact will be made in person. The teacher will be given the recruitment letter and consent forms for review. A signed application from the Principal of Archer High School is attached, the original will be mailed. An email from instructional support personnel within Gwinnett County Schools is also included outlining county policy regarding local research requests. Policy is stated as follows:

GCPS Employee requesting to conduct research only at the school where they are employed:

When GCPS employees plan to conduct research at their own schools only, an abbreviated research plan must be submitted to the employee’s principal on a Local School Research Request Form. This form must be completed by the employee and approved/signed by the employee’s principal. A photo copy or fax (678-301-7088) must be sent to the Department of Research and Evaluation at the Instructional Support Center for documentation and filing. No further approval is necessary or available.

● Recruitment letter and consent form will be sent to parents (form attached) in the students daily folder. This is the usual method of communication used between special education staff and parents to obtain signatures and consent for meetings within Gwinnett County. Researcher will be available for any questions parents may have regarding their child’s participation. If parents do not respond, investigator will attempt to call parents personally,

● Students of parents that have provided consent will be screened for pre-requisite skills using prompting evaluation form. The screening consists of the student being able to follow a video model, visual attention skills, and the motor planning skills necessary to complete the task.
 Students will be identified for the study and parents will be informed of their participation by letter sent home with the student.

E. **PROCEDURES FOR PAYMENT OF SUBJECTS**
No compensation will be provided for participation in this study.
No external funding was obtained for this project.

F. **CONFIDENTIALITY**

The records of this study will be kept confidential, to the extent permitted by law. The verbiage on the parental consent form is as follows:

There are federal laws that say we must keep your child’s study records private. We will keep the records of this study private by not recording your child’s name. Your child will be assigned a number.

The data obtained through this study will be kept for three (3) years after this study concludes will be stored in a locked cabinet and office at Archer High School within the special education department. Only individuals authorized to access educational records will have access to these files. The results of this research study might be published, but the child’s name will not be used and other identifying information will be removed. After the three year period, all documents will be destroyed.

However, certain people may need to see your child’s study records. By law, anyone who looks at your child’s records must keep them completely confidential. The only people who will be allowed to see these records are:

- Certain government and university people who need to know more about the study. For example, individuals who provide oversight on this study may need to look at your child’s records. These include the Liberty University Review Board (IRB) and the staff that work for the IRB. Individuals who work for Gwinnett County Public Schools that provide other kinds of oversight to research studies may also need to look at your child’s records.

- Other individuals who may look at your child’s records include: agencies of the federal, state, or local government that regulates this research. This includes the Department of Health and Human Services (DHHS) and the Office for Human Research Protections. They also need to make sure that we are protecting your child’s rights and safety.

- We may publish what we learn from this study. If we do, we will not let anyone know your child’s name. We will not publish anything else that would let people know who your child is.

G. **POTENTIAL RISKS TO SUBJECTS**
There are no known physical or financial risks known in this study.
H. BENEFITS TO BE GAINED BY THE INDIVIDUAL AND/OR SOCIETY

A teaching tool that would allow for students to repeatedly practice a task without direct teacher supervision would not only help to develop the independent living skills of these students, but also give the teacher an opportunity to work with other students. Video prompting is promising as an alternative means of presenting tasks to students efficiently and systematically. Identifying effective research-based methods for teaching functional skills to students with disabilities is critical for maximizing independent functioning.

I. INVESTIGATOR’S EVALUATION OF THE RISK-BENEFIT RATIO

Video prompting appears to be a promising tool that can be used to instruct students with intellectual disabilities multi-step tasks in a wide range of settings.

J. WRITTEN INFORMED CONSENT FORM

Please see attached form.

K. WAIVER OF INFORMED CONSENT OR SIGNED CONSENT

L. SUPPORTING DOCUMENTS attached

M. COPIES:

For investigators requesting Expedited Review or Full Review, email the application along with all supporting materials to the IRB (irb@liberty.edu). Submit one hard copy with all supporting documents as well to the Liberty University Institutional Review Board, Campus North Suite 1582, 1971 University Blvd., Lynchburg, VA 24502.
APPENDIX E: PARTICIPATION AGREEMENT AND CONSENT

July 22, 2011

Dear Parents:

Thank you for allowing your child to be screened for participation in the research study:

THE USE OF VIDEO PROMPTING VIA AN IPAD® AND A SYSTEM OF LEAST-TO-MOST PROMPTING TO TEACH INDIVIDUALS WITH MODERATE INTELLECTUAL DISABILITIES THE VOCATIONAL TASK OF ROLLING SILVERWARE

Your child meets criteria for participation in the research study which will begin on October 1, 2011. Your child will be working one-on-one with either myself or Ms. Haywood on the vocational task of rolling silverware. Your child is not being graded or scored and will be allowed to pick a small treat (a piece of candy) at the end of each session.

Please feel free to ask any questions you have now, or at any point in the future. You can reach me at Kelly_f_Williams@gwinnett.k12.ga.us If you have any questions or concerns about your child's rights as a research subject, you may contact the Liberty University Institutional Review Board (IRB) at irb@liberty.edu.

Sincerely,

Kelly F. Williams
## APPENDIX F: MODELING SKILLS EVALUATION FORM

Participant ID:

Date:

<table>
<thead>
<tr>
<th>Behavior on Video Clips</th>
<th>Modeled Skill</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Practice clip: Clapping hands</td>
<td></td>
</tr>
<tr>
<td>1. Turning cup over</td>
<td></td>
</tr>
<tr>
<td>2. Sorting colored straws</td>
<td></td>
</tr>
<tr>
<td>3. Folding napkin in half</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX G: INTER OBSERVER AGREEMENT FORMS

Inter observer Agreement Form- Video Prompting Only

Participant:  
Date:

Name of data collector:

Initial prompt:

<table>
<thead>
<tr>
<th>Task Analysis</th>
<th>Independent Completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Picks up napkin from stack</td>
<td>Y  N</td>
</tr>
<tr>
<td>2. Lays napkin down flat in triangle</td>
<td>Y  N</td>
</tr>
<tr>
<td>3. Fold napkin corner to corner to form triangle</td>
<td>Y  N</td>
</tr>
<tr>
<td>4. Turn napkin so long end is closest to you</td>
<td>Y  N</td>
</tr>
<tr>
<td>5. Takes knife from bin</td>
<td>Y  N</td>
</tr>
<tr>
<td>6. Knife is placed long ways on napkin</td>
<td>Y  N</td>
</tr>
<tr>
<td>7. Takes fork from bin</td>
<td>Y  N</td>
</tr>
<tr>
<td>8. Fork is placed on top of knife in same direction</td>
<td>Y  N</td>
</tr>
<tr>
<td>9. Takes second fork from bin</td>
<td>Y  N</td>
</tr>
<tr>
<td>10. Places second fork top of fork 1 and knife</td>
<td>Y  N</td>
</tr>
<tr>
<td>11. Roll napkin and silverware two turns</td>
<td>Y  N</td>
</tr>
<tr>
<td>12. Roll napkin and silverware two turns</td>
<td>Y  N</td>
</tr>
<tr>
<td>13. Folds left side corner of napkin in half way</td>
<td>Y  N</td>
</tr>
<tr>
<td>14. Folds right side corner of napkin in half way</td>
<td>Y  N</td>
</tr>
<tr>
<td>15. Rolls to end</td>
<td>Y  N</td>
</tr>
</tbody>
</table>
Inter observer Agreement Form- Video Prompting and Least-to-most Prompting

Participant: [Blank]

Name of data collector: [Blank]

**KEY:**
- 0. Independent (I)
- 1. Verbal prompt (V)
- 2. Gestural (G)
- 3 Partial physical prompt (PP)
- 4. Full physical prompt (FP)

<table>
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