EFFECTIVENESS OF VIDEO MODELING DELIVERED VIA AN *IPOD* TO TEACH STUDENTS WITH AUTISM TO LOCATE LIBRARY BOOKS

by

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(Under the Direction of David Gast)

ABSTRACT

The primary purpose of this study was to examine the effectiveness of video modeling delivered on an *iPod* to increase percentage of accuracy of task completion. A single subject combination design replicated across four elementary school participants diagnosed with autism was used to evaluate the percentage of steps completed accurately. Videos were created in subjective view, as if participants were performing the task, and downloaded to an *iPod* Nano. Multiple opportunity initial probe trials will be conducted to establish the percentage of accuracy participants performed the target behavior. During instruction videos were presented the entire task to participants and post video modeling probe trials were conducted to assess percentage of accuracy after instruction. Additional efficiency data were collected on number of sessions and errors to criterion. Data on types of errors, duration, latency, and topographical errors were also collected.

INDEX WORDS: Portable video-based instruction, functional skills, video modeling, autism, *iPod*

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DEDICATION

To mom, I finished! To my family and friends, whom without your support, this would have been impossible. To all students with disabilities in hopes that research continues to identify and question ways to provide quality instruction.

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CHAPTER 1

INTRODUCTION

The term "functional skills" is typically used to refer to life skills people need to independently live or work within their community, work place, or home (Sowers & Powers, 1995). Systematic response prompting procedures have successfully been used to teach participants with a variety of diagnoses functional skills (Collins, Gast, Wolery, Holcombe, & Leatherby, 1991; Hughes, Schuster, & Nelson, 1993; Schoen, Lentz, & Suppa, 1988). Presently, there is growing literature on the use of video supported instruction for functional skills, by integrating technology and systematic response prompting procedures (Norman, Collins, & Schuster, 2001). One theoretical basis of video instruction is rooted in observational learning (Bandura, 1969) and discussed further in *Social Learning Theory* (Bandura, 1977). Bandura discusses students' ability to engage in observational learning or learning skills by watching models of persons performing those skills. Existing literature demonstrates that participants with intellectual disabilities have the ability to learn functional skills through observational learning (Clark, Kehle, Jenson, & Beck, 1992; Farmer, Gast, Wolery, Winterling, 1991; Gast, Doyle, Wolery, Ault, & Baklarz, 1991; Griffen, Wolery, & Schuster, 1992). It can be argued that video instruction, i.e., the presentation of a model via video, provides another opportunity for participants to learn through observation, in contrast to live demonstration.

Mechling (2005) and others have cited several benefits of video technology. Video offers an opportunity for participants to view the same model as often as necessary (Ayres & Langone, 2005; LeGrice & Blampied, 1994), can be used by a variety of instructors (Charlop-Christy, Le, & Freeman, 2002), can be used outside the classroom, and is potentially cost-efficient (Branham, Collins, Schuster, & Kleinert, 1999) when compared to in-vivo training. In addition, Ayres and Langone (2005) pointed out that video modeling is superior to using live models regarding time, scheduling and availability of live models. An additional benefit of video over live models includes the possibility of editing the video examples to provide greater clarity and structure of skills targeted for instruction. For example, video footage can be customized for participants by emphasizing salient task features and manipulating video length (McCoy & Hermanson, 2007). Finally, video footage can also be downloaded onto portable devices and played on demand where live models may not be accessible or where multiple sets of materials are necessary, but not available. This can be advantageous on community based instruction (CBI) or on vocational training sites. Portability can help students to use, as needed, video clips to learn new skills and complete learned skills across novel settings with relative ease.

Purpose of Study

The primary purpose of this study was to examine the effectiveness of video modeling delivered on an *iPod* to increase percentage of accuracy of task completion for children diagnosed with ASD. Therefore, this current study was designed to evaluate video modeling as a means to teach independent and accurate completion of a functional skill. The research question addressed is: Will video modeling presented on a portable device (*iPod*) increase learners' with ASD independent and accurate ability to locate library books using the computerized media catalog system?

Definitions

Video Modeling: Definitions within the field of special education exist to differentiate video modeling from video prompting. Video modeling is the presentation of the entire target behavior to participants (Haring, Kennedy, Adams, & Pitts-Conway, 1987; Le Grice & Blampied, 1994), upon which after viewing participants are asked to perform the entire target behavior.

Video Prompting: Video prompting refers to playing a video clip of each step of the target behavior that is being completed in isolation (Cihak, Alberto, Taber-Doughty, & Gama, 2006). Participants view a video clip of one step in the task analysis and then complete the step viewed.

Observational Learning: Broadly defined, observational learning refers to the ability for people to learn new behaviors by watching others perform those behaviors (Bandura, 1986; Browder, Schoen, & Lentz, 2001).

Autism Spectrum Disorders: Autism (ASD) is a disability characterized by impairments in social interaction, communication, and restricted repetitive and stereotyped patterns of behavior, interests and activities, with onset prior to age 3 years. A diagnosis of ASD includes total of six (or more) items from social interactions, communication, and repetitive interest, with at least two from social interaction, and one each from communication and repetitive interests.

Qualitative impairment in social interactions must be manifested by at least two of the following: 1) marked impairments in the use of multiple nonverbal behaviors such as eye-to-eye gaze, facial expression, body posture, and gestures to regulate social interaction; 2) failure to develop peer relationships appropriate to developmental level; 3) a lack of spontaneous seeking to share enjoyment, interests, or achievements with other people; and 4) lack of social or emotional reciprocity. Qualitative impairments in communication must include at least one of the following: 1) delay in, or total lack of, the development of spoken language; 2) in individuals with adequate speech, marked impairment in the ability to initiate or sustain a conversation with others; 3) stereotyped and repetitive use of language or idiosyncratic language; and 4) lack of varied, spontaneous make-believe play or social imitative play appropriate to developmental level. Restricted repetitive and stereotyped patterns of behavior, interests and activities, must be manifested by at least two of the following: 1) encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus; 2) apparently inflexible adherence to specific, nonfunctional routines or rituals; 3) stereotyped and repetitive motor mannerisms; and 4) persistent preoccupation with parts of objects. (American Psychiatric Association [APA], 2000)

Delivery Device(s): Technology used to present video models or clips, regardless of independent variable, which can include, individually or in combination, video modeling, video prompting, or computer based video instruction.

CHAPTER 2

REVIEW OF RELATED LITERATURE

This chapter presents a review of observational learning, the theoretical foundation for video modeling, along with characteristics of ASD as they relate to observational learning. Empirical research using video during instruction of functional skills, including information on delivery devices, video modeling, video prompting, and the use of video to present the discriminative stimulus will also be reviewed. Articles using video modeling to teach participants with ASD functional skills are then evaluated on single subject quality indicators (Horner et al., 2005).

Observational Learning

Observational learning has occurred when a participant acquires a new behavior not in their repertoire only after models perform the behavior (Bandura, 1986). The theoretical basis for observational learning began with the work of Bandura when preschool children were found to engage in more aggressive behaviors after observing a more aggressive model (Bandura, Ross, & Ross, 1961). Bandura's early work demonstrated the ability for preschool children to vicariously learn aggressive behavior through modeling without reinforcement (Artino, 2007). The ability for these preschool children to engage in behaviors simply by observing them was contrary to current behaviorist models.

Behaviorists focus on shaping behavior by using the principles of reinforcement (Morris, Smith, & Altus, 2005), where the model is presented to a student, the student imitates the model and is then reinforced for correct responding and incorrect responding is either ignored or punished. Though this pattern explains acquisition of new behaviors, it does not explain when observed or new behaviors are emitted or organized into original behaviors in novel context without models. Further, Bandura (1977) argued that consequences of modeled behaviors may affect motivation for observational learning, but that reinforcement, particularly reinforcement history, did not explain why people learn through observation.

Many terms have been used to refer to learning through observation including imitation or co-active imitation (Sternberg, McNervey, Pegnatore, 1985). Bandura (1986) defined imitation as modeled behavior close in time and cautioned limiting observational learning to imitation training. Observational learning leads to a change in behavior by observing a model and can differ from imitation. For example, a person can alter their behavior from observing the consequences of another engaging in deviant behavior. Browder et al. (2001) created an observational learning or imitation hierarchy, which represents a learning continuum from non-imitative to generalized imitation.

Within the hierarchy created by Browder et al. (2001), during the first stage of observational learning, students are still learning to imitate another’s behavior and imitative abilities are viewed as a pre-requisite to learning through modeling. During initial imitation training, students need to be taught which relevant aspects of the models behavior to attend to and under which circumstances. Once students are taught basic imitation, instructors should scaffold skills to encourage more complex sequences of imitation with increased focus on functionality. At this level, students would be expected to model another’s behavior absent of direct instruction and teachers are required to assess and reinforce appropriate models. According to Browder et al., the final stage of imitation is to independently acquire skills by observing a model and then generalizing the learned behavior in new context without the model. Reinforcement for correctly modeled behaviors is still provided to participants, though the model is absent.

The explanation for why people learn through observation has roots in four processes: attention, memory or retention, production and motivation (Bandura, 1986). Selective covert attention refers to concentrating on salient features of a modeled behavior and ignoring irrelevant stimuli (Artino, 2007). Attending to and distinguishing between modeled behaviors is critical to participants' ability to learn through observation. Participants' selective or sustained attending behaviors can be influenced by (a) properties of modeled activities, (b) observer characteristics, (c) behavior functionality, (d) model attraction, (e) model enhancement, and (f) structural arrangements. Bandura suggests that providing feedback can direct participants to salient aspects of modeled behavior, but cautioned against providing too much feedback or modeled information. Badets, Blandin, Wright and Shea (2006) assessed the effects of an error correction incorporating knowledge of results (KR) by comparing KR on every trial (100%) to KR on a faded schedule (50%). The purpose was to enhance participants' attention to the model's performance of physical behaviors by providing participants' feedback and drawing their attention to relevant features of behaviors. Results indicated that participants provided with KR on a faded schedule performed the observed physical behaviors with greater stability. Badets et al. suggest KR feedback on a faded schedule reduced responding errors and allowed participants an opportunity to construct symbolic representations of the task observed.

Memory refers to a persons' ability to store or encode, retain and retrieve information about the observed behavior (Ozonoff & Strayer, 2001). While watching modeled behaviors, participants first attend to then transform the relevant features of the behavior into mental representations. As a behavior is modeled by different people in slightly different ways, students' mental representations are repeatedly shaped and merged into one mental image of the modeled behavior. Students can then combine mental images to perform novel behaviors or retrieve specific images upon certain discriminative stimuli. Imitating a model's behavior without transforming the actions into mental representations will not improve retention, which is already impaired for people with cognitive deficits.

Production, as theorized by Bandura (1977, 1986) refers to the physical reproduction of observed behaviors. This requires that participants recall mental representations of observed behavior and transform those images into visible behavior. Students must have the physical ability to reproduce modeled behaviors. Production is closely tied to attention. If students do not attend to critical aspects of models, during production, errors can occur, either generating incorrect or fragmented steps of the behavior. Production can be enhanced through repeated exposure to models, teaching necessary component skills needed to perform the behavior, or drawing students' attention to relevant aspects of modeled behavior through feedback. When discussing motivation, social cognition is closely linked to the principle of reinforcement in behaviorism; people are more likely to reproduce behaviors which have in the past resulted in reinforcing effects compared to behaviors which have resulted in punishment. Performing skills are then differentially reinforced; preferred modeled behaviors are reinforced and deviant behaviors are either ignored or punished. The result is that the student's behavior is being shaped so that preferred modeled behaviors are emitted. Reinforcement principles explain when behaviors are emitted in the absence of a model (i.e., stimulus control) but do not explain when previous modeled behaviors are combined into new behaviors. These four processes, attention, retention, production and motivation, operating concurrently, allow people to watch modeled events and transform them to matching or novel responses.

Autism Spectrum Disorders

People with ASD are typically characterized as being aloof, exhibiting sensory abnormalities (O'Neill & Jones, 1997) with a failure to attend to and respond to environmental stimuli (Pascualvaca, Fantie, Papagerogiou, & Mirsky, 1998). Reportedly, people diagnosed with ASD have deficits with sustained attention, shifting attention, joint attention (McArthur & Adamson, 1996), over-selectivity (Reed & Gibson, 2005), and have difficulty processing more complex stimuli (Burke & Cerniglia, 1990). Garretson, Rein, and Waterhouse (1990) compared the sustained attention of children with ASD to mental age typical peers and found evidence that deficits in sustained attention may be attributed to task complexity, participant motivation, and developmental delay instead of a primary impairment in attention due to ASD. Pascualvaca et al. assessed the ability for children with higher functioning ASD to focus, sustain and shift attention. Results indicate that children with higher functioning ASD had no difficulty focusing or sustaining attention compared to matched controls. Results also indicated children with ASD processed visual information better and were more impulsive processing auditory information. Since there were no deficits compared to the controls, this could also suggest focusing, sustaining, and shifting attention can be more attributed to a developmental delay than inherit in ASD.

Joint attention, the ability to alert another to an interest through non-verbal means, has received considerable research. Joint attention involves gaining the attention of a social partner using gestures or eye gaze to share interest in an object (Charman et al., 1997), either calling attention to an object or following another's attention to an object (Schertz & Odom, 2004) and is characterized by a relationship between self, other, and object (Naber et al., 2007). Underlying joint attention is motivation to share interest with others including an ability to understand the intentions of others (Mundy & Stella, 2000). Research has supported that people diagnosed with ASD have deficits in joint attention (Charman et al.; Kasari, Sigman, Mundy, & Yirmiya, 1990; Leekam & Ramsden, 2006) and may have abnormal eye movements and visual search patterns, which would affect joint attention and imitation (Brenner, Turner, & Muller, 2007). Research also supports the ability to teach joint attention to those diagnosed with ASD. Taylor and Hoch (2008) taught three participants with ASD to respond to bids for joint attention and initiate joint attention. Teaching children with ASD to initiate and respond to joint attention bids can have collateral effects on language (McArthur & Adamson, 1996) and opportunities to learn by observing the environment.

Bandura, Grusec, and Menlove (1966) emphasized that one component of attending is not overwhelming the observer with complex models, increasing the chance that the observer will have the ability to focus on the critical features of a model's performance of a behavior. Research confirms that when children with ASD are presented with complex stimuli involving multiple components, they have limited responses (Libby, Powell, Messer, & Jordan, 1997), although people diagnosed with ASD have successfully been taught to respond to multicomponent stimuli (Libby et al.). Teaching people with ASD to respond to multicomponent stimuli can enhance observational learning (Burke & Cerniglia, 1990). Another component of attending to a model's behavior is discerning whether modeled actions are intentional or accidental. Observational learning not only implies learning a modeled behavior, but also discriminating which behaviors to model and under which contexts modeled behaviors are or are not appropriate to imitate (Bandura, 1986). Results from D'Entremont and Yazbek (2007) indicate that children with ASD imitated as many intentional as accidental modeled behaviors. This suggests that children with ASD are unable to understand the intentions behind a person's actions, possibly due to theory of mind (TOM) deficits. Carpenter, Pennington, and Rogers, (2001) also found differences in children's ability to understand other's intentions, however impairments were not as marked as on traditional TOM tasks. The implications are that children with ASD may not be able to discern which modeled behaviors to emulate because they do not possess the ability to understand the purpose behind the models actions.

Marked deficits in imitation are also well documented (Ganz, Bourgeois, Flores, & Campos, 2008; Ingersoll, 2008; Roeyers, Van Oost, & Bothyune, 1998; Ross, & Greer, 2003; Stone, Ousley, & Littleford, 1997; Williams, Whiten, & Singh, 2004), including cognitive imitation (Subiaul et al., 2007). Despite deficits, people with ASD can be taught imitation and have successfully been taught to imitate live models of peers (Carr & Darcy, 1990; McGee, Almeida, Sulzer-Azaroff, & Feldman, 1992), adults, including parents (Charlop & Trasowech, 1991; Ingersoll & Gergans, 2007; Laski, Charlop, &

Schreibman, 1988), siblings (Jones & Schwartz, 2004; Knott, Lewis & Williams, 2007; Reagon, Higbee, & Endicott, 2006) and video models (Hine & Wolery, 2006; Nikopoulos & Keenan, 2007; Paterson & Arco, 2007) . Beadle-Brown and Whiten (2004) conducted “do-as-I-do” instruction in 1:1 arrangements for adults and children with ASD. Contrary to research on autism and imitation, Beadle-Brown and Whiten found that two groups of people with ASD had no general deficits, when compared to typical peers and same age peers with intellectual disabilities. They demonstrated an ability to learn imitation and would imitate when encouraged to do so. There were significant differences in imitative abilities between 3-4 year olds and 5-6 year olds with ASD with the 5-6 year olds imitating actions more accurately. A substantial literature base supports teaching imitation to people with ASD in 1:1 format using structured teaching and reinforcement, but little research has explored teaching people with ASD imitation within natural context (Brown, Brown, & Poulson, 2008) or in group arrangements.

Several different memory processes exist, though research on ASD and their memory is scant and mixed (Millward, Powell, Messer & Jordan, 2000). Generally, people with ASD are considered to have good rote memory, echoic memory (Boucher, 1978), and associative memory (Millward et al.). Deficits in event or episodic memory (Boucher, 1981; Boucher, Bignam, Mayes, & Muskett, 2008) and recall memory (Boucher & Lewis, 1989; Millward et al.) have been noted for participants with ASD. Working memory is thought to be an executive function (Ozonoff & Strayer, 2001) and research suggests executive functioning is difficult for persons with ASD (Verte, Geurts, Roeyers, Oosterlann, & Sergeant, 2006). The limited ability to recall events or behaviors engaged in by persons with ASD compared to what those persons observe others doing has been documented (Milllward et al.). Millward et al. were interested in the recall of children with autism compared to typically developing children. Results indicate that children with ASD had memory recall deficits compared to typical children. In addition, children with ASD had more difficulty recalling events they participated in compared to recalling events they watched their peers participate in. These results could have implications for people with ASD including using video for instruction.

Methods

An electronic (ERIC, PsyINFO) search of journals focusing on education and intervention for people with disabilities was conducted using the following keywords: *video modeling, videotape modeling, video model, video prompting, computer based video, video based, self-modeling*, *video self-modeling*, *videotape self-modeling, video-based simulation, video simulation, video instruction, videotape instruction, VSM, video interventions, portable device, iPod, iPhone*, and *video feedback*. An ancestral search of previous meta-analysis and literature reviews (Ayres & Langone, 2005; Bellini & Akullian, 2007; Delano, 2007; Hichcock, Dorwick, & Prater, 2003; McCoy & Hermansen, 2007; Mechling, 2005; Mechling, 2007; Wissick et al., 1999) was conducted. Additionally, reviewing reference lists for articles located was conducted. A hand search (1985-2010) of the following journals was also conducted in an effort to locate all articles; *Education and Training in Autism and Developmental Disabilities* (ETADD), *Education and Treatment of Children* (ETC), *Exceptionality, Journal of Applied Behavior Analysis* (JABA), *Journal of Autism and Developmental Disabilities* (JADD), *Journal of Special Education* (JSE), *Journal of Special Education Technology* (JSET), *Research and Practice for Persons with Severe Disabilities* (RPPSD), and *Topics in*

Early Childhood Special Education (TECSE). An author search was also conducted on Ayres, Kevin; Cihak, David; Langone, John; Mechling, Linda and Van Laarhooven, Toni.

Use of Video During Instruction

Table 1 presents an overview of identified studies. Forty seven studies, published between 1987 and 2010 were identified as using video within instruction (i.e., video prompting, video modeling, video error correction, etc.) to teach functional skills. Studies were published in various special education journals (see Table 2) and targeted a variety of functional skills (see Table 3). Studies included a total of 168 participants (male: N = 104; female: N = 51, not reported N = 14) with a variety of diagnoses (intellectual disability, N = 125; ASD, N = 60; other, N = 6; not reported, N = 3). Participants ranged in age from 5 years 1 month to 72 years. A variety of single subject research designs were used, including; multiple probe (MP; N = 23), multiple baseline (N = 13), adapted alternating treatments design (AATD; N = 9), and a combination design (N = 2; MP with AATD and alternating treatments design with withdrawal design). Most studies (N = 45) conducted intervention sessions individually and two studies conducted video instruction in a group arrangement (Alberto et al., 2004; Norman et al., 2001).

Video presentation during instruction was categorized into 8 different delivery devices: television, projector screen, computer, laptop computer, pocket PC, portable DVD player, augmentative and alternative communication (AAC) devices, and *iPod*. Table 4 presents video delivery devices across years and Table 5 presents delivery devices categorized by disability and independent variable. A majority of the studies (N = 15) delivered video instruction on a laptop computer or television. Portable DVD players were used in five studies, computers were used in six studies, AAC (*Mercury Mini Merc*) computers were used in four studies, pocket PC and *iPod* were both used in two studies and one study used a projector screen to present video during instruction. With advancements in technology, computers offer a variety of adaptations beyond playing video. Multimedia strategies for instruction incorporated sound, photographs, response prompting procedures and video into computer based video instruction (CBVI). By incorporating the above elements, in addition to reinforcement, participants, when trained to use the computer program, could independently teach themselves skills. All necessary aspects of direct instruction could be incorporated into the computer. Though laptop computers were used to deliver instruction in some of the studies, devices which offer more portability exist and the next generation of research is beginning to extend the application of video instruction to these devices.

Video Model or Prompt

Video Modeling. Table 6 categorizes the independent variable by disability. Table 7 provides a list of the studies categorized by how video was used in the study (i.e., video modeling, video prompting, video modeling and video prompting, set occasion). An important component of video modeling or prompting is that the response topography must be shown on the video. In reviewed studies, video modeling or prompting occurred pre-session to community based instruction (CBI) or classroom training.

Alcantara (1994) used video modeling prior to CBI sessions, where participants were required to engage in the target behavior. A video model of the entire task was presented to participants within the classroom setting in 1:1 arrangements. Ayres and

Langone (2007) used video modeling to teach participants to put away food items, however, the video clips were segmented by item with an active attentional cue that was built in between each video clip. Ayres, Maguire, and McClimon (2009) combined video modeling with CBVI to teach 3 elementary age students with ASD a cooking task. During CBVI, students watched video clips, captured in first person, of each target behavior. Subsequent to the video model and using system of least prompts (SLP) students completed a computer simulation of each step in the cooking task. Video modeling paired with computer simulation was effective in teaching students to perform targeted cooking tasks in vivo. Ayres and Cihak (2010) replicated Ayres et al. (2009) with middle school participants with middle school participants with intellectual disabilities.

Bidwell and Rehfeldt (2004) evaluated video modeling to teach three adult participants with intellectual disabilities how to make coffee. Multiple opportunity initial probe trials were conducted to assess responding. During instruction, participants performed an initial probe trial, if responding was not at criterion levels, participants watched the video clip of the task being completed, followed by another probe trial. Video modeling was effective in teaching all participants to make coffee. Cihak and Schrader (2008) compared video modeling perspectives, self-model compared to adult model in task acquisition. Four participants with ASD learned and maintained vocational and pre-vocational task during both conditions and prefer on type of model varied by participants. Haring et al. (1987) and Haring, Breen, Weiner, Kennedy and Bednersh (1995) used video modeling to teach participants to purchase items in a store. Participants viewed the video model then participants were asked to watch the video model again while answering questions related to the videotape. Videotape training was effective in teaching participants to purchase items in a store.

Lasater and Brady (1995) used 15 s to 30 s self-modeling vignettes demonstrating correct and incorrect topographies. Participants were required to view these video models and answer questions related to the accuracy of task completion prior to performing the task themselves. Participants' rate of responding increased upon introduction of video modeling. Mechling, Gast, and Gustafson (2009) taught fire safety (i.e., putting out a fire) using a portable DVD player. The student watched the video of extinguishing a fire and was then immediately asked to perform the modeled behavior. Video modeling was effective in teaching all participants three different ways to put out a fire. Rehfeldt, Dahman, Young, Cherry and Davis (2003) taught three adults how to make a peanut butter and jelly sandwich using video modeling and results indicate video modeling was effective in teaching all three participants to make a sandwich.

Shipley-Benamou, Latsker, and Taubman (2002) used video modeling prior to classroom probe sessions to teach students with ASD daily living skills. Video modeling resulted in acquisition of targeted skills. Taber-Doughty, Patton, and Brennan (2008) taught participants with moderate intellectual disabilities to conduct a computer search to locate books in a library. Taber-Doughty et al. compared simultaneous video modeling to delayed video modeling. Both types of video modeling were effective and efficiency measures varied for participants. Van Laarhoven, Van Laarhoven-Myers, and Zurita (2007) used video modeling to teach two men vocational tasks on a job site. Both men learned all three tasks. Van Laarhoven, Zurita, Johnson, Grider, and Grider (2009) compared video perspectives (self, other, and subjective) using video modeling to teach daily living skills. There were no significant differences between video models and all participants learned most tasks regardless of the model.

Video Prompting. Alberto, Cihak, and Gama (2005) compared video prompting to static pictures for six participants with intellectual disabilities. Two target behaviors, withdrawing money from the ATM and purchasing two items, were randomly assigned to interventions. Results indicated both interventions were effective in teaching targeted behaviors and were mixed regarding superiority of interventions. Goodson, Sigafoos, O'Reilly, Cannella, and Lancioni (2007) implemented video prompting with video clips created in third person to teach four adults to set a table. One participant acquired the skill via video prompting. Subsequently, Goodson et al., collected additional baseline measures and then implemented video prompt error correction. The video prompt error condition was identical to the initial video prompting condition, except the addition of the error correction if participants did not complete step in the task analysis within 30 s. The remaining three participants acquired the targeted task with this modification.

Graves, Collins, Schuster, and Kleinert (2005) used video prompting paired with constant time delay (CTD) to teach cooking skills. Pairing video prompting with a 5 s CTD procedure resulted in acquisition of targeted tasks for all three participants. Le Grice and Blampied (1994) used video prompting prior to classroom trials to teach participants to use classroom technology. Video clips, ranging in length from 10 s to 15 s showed a model starting the step in the task analysis and then transitioned to showing a close up of the relevant features of the step. Video prompting was effective in teaching four participants to turn on and off a video recorder and computer.

Mechling, Gast, and Fields (2008) incorporated video prompting onto a DVD. Each task was presented using total task sequence paired with system of least prompts (SLP). All participants learned how to make all three meals. Mechling, Gast, and Seid (2009) combined pictoral, auditory and video prompts delivered on a pocket PC to teach three cooking tasks to students with ASD. Participants could self-select the prompt necessary to complete the step in the task analysis. Video was incorporated in the form of a video prompt and once the step was viewed, participants performed the step in the task analysis. Self-prompting using the pocket PC was effective in teaching all participants all cooking tasks. Mechling and Gustafson (2008), Mechling and Gustafson (2009) and Mechling and Stephens (2009) compared video prompting to static picture prompts to teach cooking tasks. All participants performed at higher rates of correct responding during the video prompts condition. Mechling and Ortega-Hurndon (2007) used Powerpoint to embed video clips linked to static photographs to teach participants three job skills. Using 3 s CTD with the video clips as the controlling prompt resulted in all participants learning all targeted tasks. Sigafoos et al. (2005) and Sigafoos et al. (2007) evaluated video prompting to teach adults with ASD and moderate intellectual disabilities to make microwave popcorn and to wash dishes. Both studies demonstrated the effectiveness of video prompting in teaching functional skills to participants with ASD and intellectual disabilities.

Video Model and Prompt

Branham et al. (1999) used CTD and compared three intervention orders: (a) classroom simulation plus CBI, (b) videotape modeling plus CBI, and (c) videotape modeling plus classroom instruction plus CBI. Regarding the use of video, participants were presented with a video model of the entire task. After the video model, participants viewed each step in the task, which was separated by 10 s still frames. Results varied by participant, however, videotape modeling plus classroom simulation plus CBI was most efficient in number of sessions to criterion. Mechling, Gast, and Barthold (2003) combined video modeling and video prompting during classroom instruction and assessed generalization of skills in novel environments. Participants first watched a video model of the entire task; afterwards video prompts were used as controlling prompts during CTD instruction. All participants learned how to use a debit card. Mechling and O'Brien (2010) taught three students to navigate the city bus system to travel from their instructional site to a retail outlet mall. The bus route was recorded in its entirety and then the video was segmented into video clips based on the task analysis. At the beginning of instruction, participants watched the video model followed by video prompting. The combination of video modeling and video prompting was effective in teaching participants to navigate the city via a bus.

Norman et al. (2001) taught participants self-help skills by allowing them to watch a video model of the task prior to implementing a 5 s CTD procedure where the video clip was the controlling prompt. All participants acquired targeted self-help skills. Van Laarhoven, Johnson, Van Laarhoven-Myers, Grider, and Grider (2009) used video prompting delivered on an *iPod* to teach one participant vocational tasks. Delivering video prompts on an *iPod* was effective in teaching all targeted behaviors. Van Laarhoven and Van Laarhoven-Myers (2006) used video as both a model and prompt and compared video presentation with static pictures on effectiveness and efficiency measures. Though all interventions were effective, video prompting resulted in faster acquisition for all participants. One study, Cannella-Malone, Sigafoos, O'Reilly, de la Cruz, and Lancioni (2006), compared video modeling to video prompting to teach six adults to set the table and put away groceries. Video prompting resulted in fewer sessions to criterion for all participants.

Video Presentation of Discriminative Stimulus

In the studies below, video was used to set the occasion for a response. The response topography is not shown in the video rather the purpose of the video clip is to provide participants with stimulus or setting information. Ayers and Langone (2002) and Ayres, Langone, Boone, and Norman (2006) used video to set the occasion for teaching participants to pay using the "dollar up" method. A video clip of a cashier telling participants a total purchase price was played and afterwards participants used the computer to select the appropriate dollar amount. Using 4 s CTD, Cuvo and Klatt (1992) compared CBI, videotape and flashcard instruction to teach community signs to six participants. Video was used to present the discriminative stimulus to participants. Video clips showed the community signs at a distance for 5 s and close up for 10 s. Using video to present the discriminative stimulus was effective in teaching the target behavior. Kyhl, Alper, and Sinclair (1999) taught community grocery word signs and used video to present overhead signs in a local grocery store within the community. The video clip displayed each target word for 50 s then zoomed in on each target located on the overhead signs. After the video clip, the teacher asked the student "What is this word?" A 5 s CTD procedure combined with the discriminative stimulus displayed on the video was effective in teaching participants target words.

Mechling (2004) and Mechling and Gast (2003) used CBVI to teach participants to read grocery aisle signs and locate corresponding items from a shopping list or provide incidental information. The purpose of video in Mechling was to emulate a person walking down the grocery aisles. Meching and Gast presented incidental information through video when participants responded correctly. The remaining multimedia instructional package consisted of digital photos presented and controlled using the software program *Hyperstudio 3.1 or 4.0* (Roger Wagner, 1997). The CBVI paired with CTD was effective in teaching participants to locate grocery items by reading aisle signs. Mechling and Cronin (2006) and Mechling, Pridgen, and Cronin (2005) used similar procedures to teach participants to use augmentative and alternative communication devices to order and eat in a fast food restaurant. Video was used to present the cashier at a fast food restaurant asking for the participants order. Mechling, Gast, and Langone (2002) used video for two purposes, to set the occasion for the setting and to model appropriate responses. To occasion the setting, they included video clips of the grocery cart progressing down the aisle and a close up of the item being placed into the grocery cart by a familiar person. The video of placing the grocery item into the cart is not considered a video prompt because by definition a video prompt requires the participant to perform the step in the task analysis after viewing the video clip, which was not a requirement for Mechling et al. (2002). Wissick et al. (1992) used video to set up aisles of different shopping environments to teach purchasing items to three participants with moderate to severe intellectual disabilities. The purpose of the video was to set up the occasion for responding by emulating a person walking to the store door and stopping and then later showing a video clip of someone waiting in line at the cash register to pay.

Video clips were also used to display the correct items being removed from the grocery shelf and placed in the cart.

Quality Indicators

All research articles were reviewed and articles including at least one participant diagnosed with ASD and using video modeling were identified. Table 8 presents the studies and the quality indicator information for studies using video modeling with students with ASD. Appropriate quality indicators were applied to each identified article. Single subject research articles were assessed on the following criteria outlined by Horner et al. (2005).

1. *Participants and Setting.* Precise descriptions of participants, including inclusion and exclusion criteria, as well as participant selections are detailed. Participant descriptions should be precise and detailed enough to allow replication and should include demographic information as well as indirect measures of environment-subject interactions (Wolery & Ezell, 1993). The setting should also be described in sufficient detail to allow replication.
2. *Dependent Variables.* Quality single subject research operationally defines the dependent variable by including the behavior dimension (i.e., number, percent, rate, etc.) plus the target behavior to be measured (i.e., number of steps completed correctly, rate of reading fluency, etc.). Dependent variables are (a) repeatedly measured within and across baseline and intervention conditions, (b) assessed for consistency through collection of interobserver agreement and (c) socially valid (Wolf, 1978).

3. *Independent Variable*. The independent variable, or the intervention, should be described in sufficient detail to allow replication. This includes describing research (a) materials, (b) actions, and (c) intervention procedures. The researchers need to also collect data on consistent implementation of intervention procedures, which can be documented through procedural fidelity (Billingsley, White, & Munson, 1980).
4. *Baseline description*. To establish a functional relation in single subject research, repeated responding during one condition (i.e., baseline or comparison condition) is compared to repeated responding during an adjacent condition (i.e., baseline logic). Therefore, it is important researchers collect multiple data measurements during baseline which allows a prediction of future responding. Baseline data should continue to be collected until there is stable responding or a contra-therapeutic trend in participant responding. Baseline procedures should be concisely operationalized with specific details to allow for replication.
5. *Experimental control*. Experimental control is documented when there is a change in the dependent variable upon introduction of the independent variable. Critical to single subject research is the replication of effects across a minimum of three points in time with one participant (within-subject replication) or across participants (inter-subject replication).
6. *External validity*. External validity for single subject research is established through the systematic replication of the independent variable. Articles were evaluated to determine if intervention effects were replicated across (a) participants, (b) settings, or (c) materials.

7. *Social validity*. A focus of applied research and subsequently single subject research has been on behaviors which are socially valid. Social validity refers to the importance of the research (a) goals, (b) procedures, and (c) findings (Wolf, 1978). Social validity data are typically collected from participants' significant others (i.e., family, teachers, etc.) using a Likert Scale survey and data should be reported for each participant on each question. In addition to coding articles on social validity, data were collected on whether researchers collected and reported social validity data from both significant others and the participants.

Each quality indicator was dichotomously coded for each study; 'yes' indicates that the study included sufficient details and adhered to the guidelines in Horner et al. (2005) and 'no' indicates the study lacked detail or did not conform to the guidelines.

Video Modeling to Teach Functional Skills to Students with ASD

Haring et al. (1987) trained three adults diagnosed with ASD to purchase food items by implementing videotape generalization training following shopping training. Videotape generalization instruction was conducted after participants' mastered criterion during the shopping training condition. Participants viewed video models of the same sequence of behaviors previously taught in the shopping condition filmed in generalization stores. While participants watched the video, researchers asked (a) "What store is this?", (b) "What is he doing?", (c) "What will she do next?", and (d) "How much will he pay?" (p. 92). Verbal praise was provided for correct responses, while incorrect responses resulted in the videotape being stopped and the correct response being modeled for participants. The introduction of videotape modeling resulted in increased accurate social responding during generalization probes. Percentage of overlapping data for percentage of social steps correctly completed was low (range = 0% - 16.6%) when compared with the previous condition, shopping training.

Alcantara (1994) taught three students to purchase items in a grocery store using videotape modeling instruction. During individual videotape instructional sessions, participants were directed to sit in front of a television and were verbally primed on the videotape they were about to view. One out of ten videotapes was randomly viewed by participants and when the video was complete, participants were immediately transported to the grocery store. Procedures during videotape instruction plus in-vivo remained identical to videotape instruction alone with the addition of a SLP (Wolery, Ault, & Doyle, 1992) procedure in the community to assist participants through the task analysis. One participant reached criteria in one store with videotape instruction only. All other participants required videotape instruction plus in-vivo instruction to meet criteria in other settings (i.e., Store A, Store B, Store C).

Haring et al. (1995) extended Haring et al. (1987) by examining the sequence of videotape modeling instruction (i.e., after, before, and during) related to in-vivo training and generalization to novel stores. Two participants were first trained to purchase items in vivo (tier 1) using SLP, followed by videotape modeling instruction to purchase items in a record store (N = 1) and a hobby store (N = 1). The second two participants were trained to purchase items in a grocery store with videotape instruction followed by in vivo instruction. The remaining two participants were trained with both methods concurrently, videotape instruction for one type of store and in vivo training in another store. During videotape instruction, participants were required to watch a video that presented the entire task. Following video presentation, the video was presented in segments and participants were asked questions as in Haring et al. (1987). Results indicate no significant differences in acquisition of target behaviors regardless of intervention order (i.e., sequential or concurrent). Results of Haring et al. (1995) replicate those from Haring et al. (1987) in that participants acquired the ability to make purchases after video instruction.

Lasater and Brady (1995) implemented an instructional package which included self-assessment, behavioral rehearsal, and self-modeling to improve the fluency (i.e., rate per minute) of self-help skills for two boys diagnosed with an ASD. Participants were filmed completing each step in the task analysis and video footage was later edited into training VHS tapes. The training tapes, each 15 s to 30 s long, showed participants correctly and incorrectly performing each step in the task analysis. These tapes were used during self-assessment, self-modeling and rehearsal sessions. During intervention sessions, participants watched the videotapes and were required to perform a self-assessment and behavior rehearsal prior to task performance. In addition, the trainer asked participants questions, such as “What is happening here?”, as they watched the vignette. Participants responding during baseline across tasks were low and an increase in level of responding was observed upon video instruction. Video instruction, combined with self-modeling, self-assessment, and behavioral rehearsal was effective on increasing fluency of self-help skills. As observed during intervention, high rates of fluency did not maintain during the intervention withdrawal condition.

Charlop-Christy, Le, and Freeman (2000) compared video modeling to in vivo training on a variety of skills, including communication, play, social, and oral comprehension. One participant, Tony, was taught functional self-help skills.

Videotapes were created for each task analysis using adult models performing the task at a slower speed. During video modeling instruction, participants were required to sit in front of the television and attend to a video depicting the entire task twice. Tony mastered criteria during video modeling instruction after three sessions and maintained responding during probes across people, settings, and stimuli. In vivo modeling also resulted in acquisition of target behaviors after seven sessions, however generalization was not achieved.

Shipley-Benamou, Lutzker, and Taubman (2002) used video modeling to teach three participants a variety of daily living skills. Single opportunity baseline probe trials (Cooper, Heron, & Heward, 2007) were conducted by placing task materials in front of participants and stating the appropriate task direction. Participants' baseline data varied; Amy responded correctly from 0% - 30%, Danny responded 0% - 60%, and David responded 0% of opportunities. During intervention sessions, participants were positioned in front of the television and were required to watch the entire video of the task analysis. Subsequently, each participant was provided with the appropriate task direction and provided with the opportunity to perform the task. Modifications to the intervention were made for one participant, Amy, during school intervention sessions. The television was lowered to her eye level and a gesture prompt was added to focus her attention on the television during intervention. All participants reached criteria and maintained skills during no-video and follow-up probes.

Cannella-Malone et al. (2006) compared video modeling to video prompting on the effectiveness and efficiency of teaching daily living skills to six adult participants. Two skills, setting the table and putting away groceries were counterbalanced across interventions and participants. Each task was filmed twice, one video to be used for video modeling sessions and the other to be used for video prompting sessions. A one sentence voice over statement describing the completed step in the task analysis was added to the videos. During video modeling sessions, participants watched a video film from a third persons' perspective of the entire task completed by a familiar adult. Video prompting footage, filmed in subjective view, allowed participants to view clips of each step being completed. Low levels (range = 0% - 30%) of responding across all participants and tasks was established during baseline measures. Video prompting resulted in faster acquisition for both targeted skills and was replicated across participants. Participants did not reach criterion on tasks instructed using video modeling, so the authors introduced video prompting to teach skills not mastered to participants using video prompting. Though an error correction procedure was introduced for one participant, data replicated the previous video prompting condition and all participants mastered criterion, 100% correct responding on targeted skills.

Van Laarhoven and Van Laarhoven-Myers (2006) compared three video based instructional procedures; video rehearsal, video rehearsal plus photos, and video rehearsal plus in-vivo video prompting. These interventions were compared to teach three participants to microwave pizza, fold laundry and wash a table. Video rehearsal involved participants viewing the task analysis sequence prior to performing the task. During the video rehearsal plus photos condition still photos printed from the video were used as a prompting aid while participants performed the task. During the video rehearsal and in-vivo video prompting, participants viewed the video based task analysis prior to and while performing the skill. *Pinnacle Studio 8*™ (Pinnacle Systems, 2002) was used to create the video task analysis and was later transferred to *Powerpoint*. Each *Powerpoint* slide contained written directions to the left with a still photo depicting the step in the task analysis on the right. Each still photo was linked to a video clip of the task step and participants were required to “click” on the still photo to view the video clip and then “click” again to advance to the next slide. Data on steps completed independently on pre-instructional probe trials were low (range=0% - 20%) across participants and target skills. All interventions were effective on increasing independent correct responding. Video rehearsal and in-vivo video prompting resulted in the highest level of independent responding. During maintenance probes, all participants decreased independent responding, but data were higher than initial pre-instructional probes.

Ayres and Langone (2007) trained four elementary aged participants diagnosed with ASD to put away three categories (refrigerator, freezer, pantry/cabinet) of groceries. The purpose of the study was to evaluate video modeling perspectives, first person (i.e., subjective view) compared to third person modeling. Thirty six grocery items were divided into six sets, six items per set. Building in general attentional responses, CBVI was created using *Aurthorware* (Macromedia, 2003) and used video clips to model putting away each grocery item. This study implemented four conditions: (a) pre-test, (b) computer based probe sessions, (c) CBVI, and (d) post-test. During pre-post test probe sessions, participants were given the task direction to put away the groceries and 10 min to complete the task. Responding across participants varied, ranging from one to six items correctly put away. Computer based probes sessions were conducted individually, where participants were shown static photographs on the bottom of the computer screen. After the computer provided the direction, participants were required to select the items storage location among four choices, refrigerator, freezer, cabinet/pantry or a neutral location. Number of correct responses remained variable ranging from zero to five. CBVI was implemented and all participants increased responding across sets and type of video model to 100% correct responding. No differences in number of correct responses were noted between type of video models during post-test (generalization) probe trials and while some students post-test data improved over pre-test data. Replication did not occur for all participants across all sets of groceries.

Cihak and Scrader (2008) compared video model, self and adult on effectiveness and efficiency measures to teach four participants with ASD to package first aid kits and family packs, make copies, and send a fax. Tasks were counterbalanced across participants and tasks. During the self-model condition, participants viewed a video of themselves completing the target behavior and during the adult model condition participants viewed an unfamiliar adult completing the task. Immediately after watching the video model, participants were asked to complete the target behavior. Error correction procedures were developed and if participants made an error, the video clip of the step was re-played. If participants continued to make an error and least-to-most hierarchy was implemented. Results are mixed regarding preferred model. Three participants responded to self-model better than an adult model on sessions to criterion however one participant demonstrated no preference.

Summary

Video modeling has been effectively combined with response prompting procedures and video prompting to teach functional skills to individuals diagnosed with ASD. Video modeling alone has also been effectively used to teach functional skills to participants with ASD. Effectiveness has been replicated across a variety of functional skills, a broad range of ages, 6 years, 2 months to 41 years and an IQ range of 45 to 95. Delivery devices have been limited to a computer, laptop computer, and the television. All of the studies have been conducted in a 1:1 arrangement and none of the studies reported included or collected data on acquisition of incidental information. In keeping with advancements in technology, further research should explore delivering video instruction using devices with more portability, such as *iPod*s, *iPhones*, *iPads*, PDAs, and other portable devices. Further research is necessary to evaluate the longevity of video interventions, i.e., are participants maintaining skills post intervention during maintenance and follow-up probes? Research is also necessary comparing and combining video modeling and video prompting on portable devices, isolating which strategies would be most appropriate for certain participants and tasks and if combining the two instructional strategies would be beneficial. Research should also focus on implementing video instruction in-group arrangements, while assessing for observational learning and acquisition of incidental information.

CHAPTER 3

METHODS

This chapter describes the methods which were used in the investigation. These descriptions include: participants, instructional settings and arrangements, equipment and materials, experimental design, instructional procedures, data collection, and data analysis. Permission from parents and consent from students to participate in the study were obtained in addition to human subjects study approval from the University of Georgia Human Subjects Review Board.

Participants

Four participants, Jon, Tom, Carl, and Max with chronological ages ranging from 9 to 10 years participated in this study. Participants attended a suburban elementary school in Georgia and were served in a self-contained classroom for students with ASD. Participants' descriptive data are listed in Table 9. Participants targeted for instruction had the ability to: (a) follow multi-step directions, (b) navigate through the *iPod* menu to watch a movie, (c) use a palmer grasp to hold *iPod*, (d) visually discriminate video on *iPod Nano* screen according to successfully passing a vision test, (e) attend to task for 20 min, (f) complete movements associated with manipulating *iPod* and computer mouse (g) imitate steps of tasks analysis, (h) have one or fewer absences every 2 weeks, and (i) type letters from a visual model. Participants who did not possess all prerequisite skills, except navigating the *iPod* were excluded from the study. Participants who did not demonstrate 100% mastery of *iPod* navigation were trained to use the *iPod* through video modeling prior to entry into the study. Hammond, Muething, Ayres, and Gast (in review) taught three of the participants (Tom, Carl, and Max) to use the *iPod Nano* through video modeling and the fourth participant (Jon) was not included in the previous study and had not been exposed to video modeling to teach any academic or functional skills. All four participants had a secondary eligibility of speech impairment and all had documented IQ's that fell below average. Carl has a private diagnosis of PDD-NOS and ADHD and Jon has private diagnosis, given by a clinical pschologist of ASD. At the time of this study, one participant was taking Risperdal. All participants received related services, 30 min per week each of occupational therapy and adaptive physical education and 1 hr per week of direct speech services.

Prerequisite Skills Assessment: *iPod* Assessment

IPod single opportunity pre-assessment probes were conducted for each participant to determine if participants could independently and accurately navigate the *iPod Nano* to watch a movie. Single opportunity probe trials provided conservative estimates on student performance and ensured participants could independently navigate the *iPod* Nano without errors. Correct (+) and incorrect (-) data were collected on each participant's ability to independently: (a) press green center button to turn *iPod* on, (b) wait for menu screen to appear, (c) put thumb on "menu" button, (d) scroll clockwise until the word "videos" is highlighted in blue, (e) press green button with thumb to open "videos" menu, (f) press green button again with thumb to open "movies" menu, (g) put thumb on "menu" button, (h) scroll clockwise until task movie is highlighted in blue, (i) press green button with thumb to start task movie, (j) watch and wait for task movie to finish playing, and (k) press and hold "play/pause" button to turn *iPod* off. Corrects were scored if participants initiated correct topographical response within 5 s of task direction ("Ok name, here is the *iPod*"). Probes were discontinued if participants (a) did not initiate within 5 s, (b) did not complete step within 10 s, (c) performed incorrect topographical response, or (d) performed a step out of sequence. Inclusion criteria were established at 100%, therefore data were converted to percentage by dividing number of steps performed independently and correctly by total number of steps in task analysis and multiplying by 100. If participants did not demonstrate 100% responding, video modeling sessions to teach the participant to use the *iPod* to access movies was implemented.

Prerequisite Skill: *iPod* Training Sessions

IPod Training sessions consisted of Pre-Video Modeling probe trials, video modeling instruction, and Post-Video Modeling probe trials. Pre-Video Modeling probe trials were "cold" trials; in other words, the student had not yet received instruction that day for using the *iPod*. The purpose of the Pre-Video Modeling probe trials was to assess participant responding prior to daily instruction. If participants did not reach criteria, 100% accurate responding on the Pre-Video Modeling probe trial, video modeling instruction was implemented. Only Pre-Video Modeling probe trial data were collected and graphed and mastery criterion was established at 100% accurate and independent responding during Pre-Video Modeling probe trials for two sessions for all participants. Establishing acquisition criterion on the Pre-Video Modeling trials is more stringent, requiring participants to maintain target behaviors over a minimum of two days. Once each participant reached mastery criteria, they were included in this study.

Following Pre-Video Modeling probe trials, if the participant failed to respond with 100% accuracy, video modeling sessions were conducted. Instructional sessions were conducted individually and involved the teacher showing participants the entire video clip depicting navigation of the *iPod* to access movies. The researcher directed a participant to the computer and told the participant to sit down ("Have a seat at the computer."). Once the participant was seated, the DVD was inserted into the computer. The teacher directed "Watch this", and the video clip displaying the target skill was shown on the computer, beginning with the task direction. Participants were required to sit at the computer and watch the video clip of the entire task analysis. Immediately following completion of the video clip, a Post-Video Modeling probe trial was conducted identical to Pre-Video Modeling probe trial. Post-Video Modeling trials were conducted to assess immediate recall of target behavior and to provide participants practice with the task analysis immediately after viewing the video clip.

Skill Identification Procedures

Target behavior selection was based on survey outcomes completed by participants' families, teachers, therapists, and participants Individual Education Programs (IEPs). Families, teachers, and related therapists were provided with a survey identifying 100 functional skills and were asked to put a check beside the functional skills they would like participants taught. Task analytic pre-assessment data sessions were conducted once for each participant and each potential target behavior. Multiple opportunity probe trials (Cooper, Heron, & Heward, 2007) were conducted. Participants were provided with the task direction, and given 5 s to initiate the first step in the task analysis. If the first step was initiated within 5 s and completed within 10 s, a correct (+)

was recorded on the data sheet and participants were given 5 s to initiate the next step in the task analysis. If participants (a) failed to initiate the first step within 5 s or (b) initiated the incorrect step, participants responses were blocked and an incorrect (-) was recorded on the data sheet. Participants' view of the materials was then blocked and the teacher completed the step for the participants. Participants were then given 5 s to initiate the next step in the task analysis. This procedure was repeated until the entire task was complete. One functional skill was identified and included because each participant performed the skill with less than 20% accuracy. The identified functional skill, locating a library book using the school library's computerized catalog system, comprised of 9 discrete steps, was identified as the target behavior due to inclusion criteria, IEP goals and objectives and social value of increasing independent community and leisure skills.

Settings and Arrangements

Individual probe trials and intervention sessions were conducted three times per week in a self-contained classroom **(**32 ½ ft x 26 ft**)**, during participants' independent work time. Independent work periods were approximately 30 min long, scheduled between 1:30-2:00PM daily. Instructional sessions and probe trials occurred in the back corner of the classroom using the teacher's laptop computer. When not used, the *iPod* was stored in a locked file cabinet in the classroom. Prior to intervention, the *iPod* was taken out of the file cabinet and placed on the teacher's desk. During Initial Probe trials and Pre-Post Video Modeling probe trials, participants held the *iPod* and afterwards handed the *iPod* to the teacher.

Generalization probe trials were conducted in the library of a public elementary school between 12:00 and 3:15 PM. Probe trials occurred in the back left of the library at the student computer stations. When entering the library, the circulation desk was located in the back, directly in front of the doors. To the right of the entrance was a seating area with a coffee table, located in front of two rows of book shelves. To the left of the entrance were more book shelves lined against the back wall and to the back left were 24 student computer stations.

Data were collected by the students' teacher and reliability data collected by a trained paraprofessional. The teacher stood behind the student while collecting data and when appropriate, the reliability data collector also stood behind the participant. A paraprofessional was responsible for monitoring nonparticipants whom were involved in various activities inside the classroom and library and were not present in the student computer station area unless during their instructional time.

Materials and Equipment

Videos were created by the researcher using a *Sony Handycam* DCR-SR42. Three library topics; dogs, cars, and bugs were identified based on participant feedback on topics of interest. Two videos were created for each library topic. The difference between each of the videos was the book selected, i.e., step four in the task analysis. The result was a total of six videos. Each task analysis was performed by the researcher and recorded in subjective view onto the video camera's hard drive. The resulting video showed only the hands of the researcher performing the task. As the researcher performed each step in the functional skill task analysis, the student's teacher narrated each step, beginning with the task direction. The length of the video clips ranged from 53 s to 1 min 1 s. Video footage was downloaded onto a *Dell Inspiron* 1420 laptop computer. Using *Quicktime Pro 7*, video footage was converted from MPEG to .m4v files for *iPod* compatibility. The .m4v files were saved onto the laptop, imported into *iTunes*, and automatically downloaded to the *iPod* when the laptop computer and *iPod* synchronized.

The *iPod* was an 8GB light green third generation *iPod Nano*, approximately 3in. x 2 in. and 1.7 oz. The viewing screen on the *iPod* measured 1 ¾ in. x 1 ¼ in. Videos for *iPod* training sessions were created similarly in subjective view. A video clip detailing the task analysis for operating an *iPod* to watch a movie was burned, using a *Dell Inspiron* 1420 and Picture Motion Browser, to a Sony DVD. The DVD was approximately 1 min 18 s long and detailed the researcher stating the steps of the *iPod* task analysis as they were completed by the student's teacher. Materials necessary for the functional skill were three preferred book topics for each participant, written on 3 in. x 5 in. unlined white index cards.

Response Definitions and Recording Procedures

***iPod* Assessment and Training Sessions.** Data for *iPod* Assessment and Training sessions were collected using task analysis recording. Upon initial task direction ("Ok <u>name</u>, here is the *iPod*"), participant's had 5 s to initiate the first step in the task analysis, turning the *iPod* on, and 10 s to complete the behavior. For each step in the task analysis, a correct (+) was recorded if participants independently initiated correct topography within 5 s and completed step in the task analysis within 10 s of discriminative stimulus. An incorrect (-) was recorded if task analytic step was (a) not initiated within 5 s (no response), (b) not completed within 10 s of initiation, or (c) completed incorrectly or out of sequence (Mechling & Ortega-Hurdon, 2007). When participants emitted an incorrect response, data were recorded on the type of error emitted. Incorrects were divided into four types of errors: (a) latency errors (L): defined as no initiation within 5 s; (b) duration errors (D): defined as task analysis step not completed within 10 s; (c) topographical errors (T): defined as incorrectly completing behavioral response; and (d) sequencing errors (S): defined as topographically correct, but performed out of order from teaching or task sequence. Recording procedures remained identical for all steps in the task analysis until task completion. After task completion, the percentage of task analytic steps completed independently and accurately was calculated by dividing the number of steps accurately and independently completed by the total number of steps in the task analysis and multiplying by 100. Once the percentage of accurate responding was calculated, data were graphed. The same recording procedure was used for each probe session.

Generalization Probes, Initial Probes, and Video Modeling Probe Trials. The independent variable, video modeling, was implemented and evaluated on percentage of steps accurately and independently completed for the target behavior. During initial probe trials and pre and post video-modeling probe trials, the target behavior was measured using task analysis recording and data was recorded identical to *iPod* Assessment and Training probe trials.

General Procedures

Individual sessions were conducted three times per week, one session per day, with each participant. All probe, intervention, and maintenance trials occurred in the afternoon between the hours of 1:00 and 2:00PM and consisted of one trial. Each session lasted no more than 20 min, including video modeling during intervention condition.

Experimental Design

A combination multiple probe design (Gast & Ledford, 2010) across four participants, replicated across three library topics, was used to evaluate the effects of video modeling to teach participants to use the media center computerized catalog system. Three experimental conditions were conducted for each participant: (a) Initial Probe trials, (b) Video Modeling sessions (Pre-Video Modeling probe trial and Post-Video Modeling probe trial), and (c) Maintenance probe trials. Initial Probe and Maintenance trials consisted of one trial and Video Modeling sessions consisted of two trials, a Pre-Video Modeling trial and a Post-Video Modeling trial.

Initial Probe trial data were collected for all target behaviors; for all four participants, for a minimum of 3 days and 3 sessions and until a stable level and trend were established. Once Initial Probe trial data were stable, video modeling was introduced to Participant 1 on Topic 1 (i.e., dogs) until criterion was met. Once criterion was met, probe trial data were collected on all three topics for all participants. After which video modeling was introduced to Participant 1 to teach Topic 2 (i.e., cars) and for Participant 2 to teach Topic 1. Staggering the introduction of instruction across Topic 1 based on participant skill acquisition allowed for objective replication of effects across participants (inter-subject direct replication). Replication of intervention effectiveness across two additional topics, provides direct intra-subject replication (i.e., repeating the experimental effect with the same participant).

Generalization Pre-Post Trials

Multiple opportunity generalization pre-post test probes were conducted in a novel setting, the school library. Participants were directed (“Let’s go have a seat at the computer.") to a student computer station. Each participant was provided with the task direction, "It's time to find a book about (topic)". After the teacher told the student the topic, she placed the white index card with the topic name on the computer. Generalization Pre-Post Probe trials were conducted identical to sessions for skill identification.

Initial Probe Trials

Multiple opportunity Initial Probe trials were conducted for each participant to gain measures of current responding. Participants were directed ("Let's go have a seat at the computer.") to the teacher's laptop computer. Each participant was provided with the task direction, "It's time to find a book about (topic)". After the teacher told the student the topic, she placed the white index card with the topic name on the computer. Initial Probe trials sessions were conducted identical to sessions for skill identification. If the participant attempted to exit the computer area of the library during Initial Probe trials, he was verbally redirected ("Let's finish") back to the materials and given 5 s to initiate the next step in the task analysis. Sessions were terminated when the participant completed the task analysis. If a participant responded incorrectly, he was turned around and shielded from the materials. The investigator completed the step in the task analysis for the participant and the participant was given 5 s to initiate the next step in the task analysis. Video modeling instruction was implemented after three sessions across a minimum of two days of stable Initial Probe trial data.

Video Modeling Sessions

Video Modeling sessions consisted of Pre-Video Modeling probe trials, video modeling instruction, and Post-Video Modeling probe trials. Pre-Video Modeling probe trials and Post-Video Modeling probe trials were conducted identical to Initial Probe trials. Pre-Video Modeling probe trials were "cold" trials and the student had not yet received instruction that day to complete the target behavior. The purpose of the Pre-Video Modeling probe trials was to assess participant responding prior to daily instruction. Only Pre-Video Modeling probe trial data were graphed and mastery criterion was established at 100% accurate and independent responding during Pre-Video Modeling probe trials for two consecutive sessions for all four participants. Establishing acquisition criterion on the Pre-Video Modeling trials was more stringent, requiring participants to maintain target behaviors over a minimum of two days. If participants did not reach criteria, 100% accurate responding on the Pre-Video Modeling probe trial, video modeling instruction was implemented.

Following Pre-Video Modeling probe trials, if the participant failed to respond with 100% accuracy, video modeling sessions were conducted and began when participants were told, "Ok name, here's the *iPod*". Instructional sessions were conducted individually and involved participants independently navigating the *iPod* as previously taught. Once the participant was seated and the participant had the *iPod* in his hand, the teacher stated, "It's time to find a book about (topic). Let's watch how to do it.", and the participant was expected to navigate to the movie on the *iPod.* Since two video clips were associated with each topic, the video clips were randomly ordered and the same video was not be played more than two times in a row.

Once the appropriate movie title was selected, the video clip displaying the target skill was shown on the *iPod* beginning with the task direction. Participants were required to watch the entire video clip of task analysis. Once the *iPod* was turned off and handed to back to the teacher by participants, Post-Video Modeling Probe trials were conducted identical to Pre-Video Modeling Probe trials. Post-Video Modeling trials were conducted to assess immediate recall of target behaviors and to provide participants practice with the task analysis immediately after viewing the video clip. Data were collected as outlined in recording procedures. Mastery criterion was established at 100% accurate and independent completion of task analysis for two consecutive sessions during Pre-Video Modeling Probes. Once participants reach mastery criterion, each participant continued to be probed for skill maintenance.

Maintenance Probe Trials

Maintenance data were collected on each participant for each skill once mastery criterion was met. A minimum of three maintenance probes were collected per functional skill for each participant. Maintenance probe sessions were conducted identical to Initial Probe trials.

Reliability

Procedural fidelity (PF) and interobserver agreement (IOA) reliability data were simultaneously collected by an independent observer, participant's special education paraprofessional, who was trained on data collection procedures. The reliability data collector was not explicitly provided information on the experimental conditions or expected outcomes. The reliability observer was provided with a copy of the behavioral definitions, a digital timer, a data sheet with which to record data, a clipboard, where the data sheet was stored and a pencil. Reliability data collection training sessions were discontinued when 90% agreement for both PF and IOA were calculated between reliability data collector and the researchers' data.

IOA and PF data were collected a minimum of 20% of sessions and at least once during each condition. IOA was calculated for each step in the task analysis (Mechling & Ortega-Hurdon, 2007) using point by point; dividing the number of agreements by number of agreements plus disagreements multiplied by 100. During Initial Probe trials and Video Modeling Sessions, occurrence (+) or nonoccurrence (-) PF data were collected on (a) adult prompts, (b) delivery of correct task direction, (c) participant's positioning, (d) task direction provided, (e) participant given 5 s to initiate response, (f) participant given 10 s to complete step, and (g) no additional preferred item or activity provided. During Video Modeling instruction, occurrence (+) or nonoccurrence (-) data were collected on above behaviors plus, participant navigated *iPod* independently and error correction was provided according to procedures. PF was converted to percentage by dividing number of correctly emitted researcher behaviors by number of planned researcher behaviors and multiplying by 100 (Billingsley, White, & Munson, 1980). At least 90% agreement was required for both IOA and PF in each condition or reliability raters were retrained.

Social Validity

At the conclusion of the study, social validity data were collected on the perceived outcomes of video modeling using an *iPod* to locate a library book. A survey using a Likert rating scale, ranging from 1, representing strongly disagree, to 5, representing strongly agree was completed for each participant. Surveys were completed by paraprofessionals, general education teachers, therapists, significant others and the special educator. Specifically, social validity data were collected on: (a) the identified behavior was important to increase for the participant; (b) questions regarding the research were answered in a prompt manner and to my satisfaction; (c) the outcomes, increase accuracy of the completion of functional skills, was significant to the participant; (d) the participant became more independent as a result of instruction; (e) I now believe the participant is able to learn from video modeling; (f) *iPods* are useful as instructional tools; (g) I believe video modeling is solely responsible for the participants learning; and (h) my opinions about using video modeling for instruction purposes have changed. Data were aggregated and the mean scores and ranges were reported for each question.

In addition to the Likert rating scale, the social validity questionnaire included open ended and yes/no questions including: (a) During the 2010-2011 school year, did this student have access to a computer at home/school?, (b) If yes, approximately how many minutes per week did the student interact with the computer?, (c) If the student does have access to the computer, approximately how many icons are on displayed on the desktop?, (d) What skills can the student independently complete on the computer (i.e., open up specific files, open up the internet, open up Microsoft word and type, open songs from the iTunes menu, etc.), and (e) In your opinion, please rate the student's computer skills by circling one of the following: beginner, intermediate, advanced. Significant others were also asked to rate three tasks according to the level of support (independent, visual, verbal, gesture, model, and physical) the student required to complete the task. Tasks included: (a) opening computer icons, (b) using a search engine to search topics on the internet, and (c) printing pages.

Participants also contributed to social validity. The following questions were administered in an interview at the end of the study: (a) Did you like using the *iPod*?, (b) Did you like watching the video?, (c) What did the video try to teach you?, (d) Did the video help you learn how to look up a book?, (e) Did you get the chance to pick out books that you like?, (f) Was looking up a book easy or hard?, (g) Did you like using the computer?, (h) Do you think you are good with the computer?, and (i) Do you use the computer at home or at school? Participant responses were recorded by primary investigator.

CHAPTER 4

RESULTS

Reliability

IOA and PF data were collected at least once during each condition for each participant. IOA and procedural fidelity data were collected 32.25% , 40.91%, 31.81%, and 25.57% across all conditions for Jon, Tom, Carl, and Max, respectively. IOA data were 100% agreement for Jon, Tom, and Max and 89% to 100% for Carl. During Pre-generalization probe trials, PF data were 100% for Tom, Carl, and Max and ranged from 91% to 100% for Jon. Procedural reliability errors during pre-generalization included not allowing Jon 5 s to initiate next response in the TA for the topics dogs and bugs. During Initial Probe trials, video modeling instruction, and Maintenance probe trials, mean PF data were 100% for all participants.

Effectiveness of Video Modeling

Jon. Figure 1 presents data on the percentage of steps completed accurately and independently for all four participants. Locating books about ‘dogs’ is represented by an open square (□), locating books about ‘cars’ is represented by an open triangle (△) and locating books about ‘bugs’ is represented by an open circle (○). Pre-generalization and Initial Probe trial data were collected on all tasks during the first four sessions of the study for all participants. Jon demonstrated stable responding with 0% accuracy. Video modeling for the first topic (dogs) was introduced to Jon on session 4 and he mastered the target behavior in 13 sessions. A verbal prompt (“Now you do it.”) was provided by the special education teacher on Post-Video Modeling probe trial during the seventh instructional session (session 12). The verbal prompt was provided because Jon failed to initiate the first step in the task analysis. The first follow-up probe trial was conducted during session 18 and results indicate Jon generalized responding to ‘cars’ and ‘bugs’ with 100% accurate completion of both tasks. Video modeling was introduced to Jon on the second topic ‘cars’ during session 19, because 100% responding was not maintained. Jon mastered criteria in 3 sessions. Jon continued to demonstrate 100% accurate responding on follow-up probe trials on the third topic ‘bugs’ and on all subsequent Probe trials. Post-generalization data were 100% accurate responding for all three book topics.

Tom. Pre-generalization and Initial Probe trial data for Tom, tier 2 of Figure 1, indicate 0% accurate responding on all target behaviors. During session 19, video modeling was introduced to Tom and he mastered topic 1 in 6 sessions. After initial instruction on the topic of “dogs”, Tom’s responding generalized to ‘cars’ and ‘bugs’ and remained at 100% accuracy for all target behaviors on follow-up probe trials and on post-generalization probe trials. Tom’s responding generalized to the other topics as demonstrated by follow-up probes conducted on each topic.

Carl. Carl’s accurate responding during Pre-generalization ranged from 10% to 20%. Initial probe trial data were variable, with responding ranging from 20% to 33% during the initial session and stabilizing at 67% responding for all target behaviors (session 28). Initial Probe trial data were analyzed and Carl demonstrated the same 3 errors on sessions 25, 27, and 28 for all three behaviors. Latency errors occurred on steps 5 and 6 and a topographical error occurred on step 7. During session 26, Carl made the same three errors, in addition to a topographical error on step 1. Since there was a therapeutic trend for data during Initial Probe trials, introduction of instruction for Carl was based on stabilization (3 days of data at or less than 67% accurate responding) of Initial Probe trial data. Upon introduction of video modeling, there was an immediate increase in performance on topic 1 and Carl reached criteria in five sessions (session 33). After initial instruction on topic 1, Carl's responding generalized to the other two behaviors, remaining at 100% accurate responding on follow-up probe trials. Carl's responding on post-generalization probe trials ranged from 89% to 100% accuracy.

Max. Pre-generalization probe trial data for Max ranged from 0% to 10% correct responding. Initial Probe trial data for target behaviors ranged from 0% to 100% accurate responding. Since criteria were mastered during Initial Probe trials, instruction was not implemented. Post-generalization responding on all topics was 100% accurate responding.

Results show a functional relation between the use of video modeling and an increase in the percentage of steps completed accurately and independently to locate library books for Jon and Tom. Since both Jon and Tom generalized responding to the remaining two topics after instruction on the first topic, there was no direct intra-subject replication regarding the independent variable. Direct inter-subject replication was obtained by replication of effects for the first target behavior across the two participants.

Results for Carl demonstrate video modeling was effective for increasing responding from 67% to 100% and replicate findings for Jon and Tom. Max did not require instruction and was able to learn the target behavior and generalize to other topics through repeated exposure to the task during the multiple probe opportunity trials. There was no functional relation between the independent variable and percentage of correct responding for Max.

Efficiency of Video Modeling

Table 11 presents data on the percentage of type of errors for steps in the task analyses for each participant for each condition. Probes trials were conducted using a multiple opportunity method, meaning if the participant made an error, the investigator shielded the participant from the materials, completed the step for the participant and then provided 5 s to initiate the next step in the task analysis. An analysis of the types of errors made, latency (L), duration (D), topographic (T), and sequence was conducted. All errors made by Jon and Tom during initial probes for each behavior were latency errors. Carl demonstrated latency and topographical errors on steps for dogs (latency = 33%; topographical = 14%) and bugs (latency = 28%; topographical = 19%) and made latency, duration, and topographical errors for cars (latency = 35%; duration = 1%; topographical = 19%). Max made latency, duration, and topographical errors for dogs (latency = 19%; duration = .9%; topographical =49%) and cars (latency =10%; duration = 2%; topographical = 69%) and made latency and topographical errors on bugs (latency = 11%; topographical = 4%). During instruction, Carl was the only participant to made topographical errors (4%), while Jon, Tom, and Carl made latency errors.

Jon had the highest number of errors (N = 230) with 228 of those errors categorized as latency errors. Jon made 2 duration errors during instruction for the first topic. Tom made the next largest number of errors (N = 130) and all of Tom’s errors were latency errors. Neither Jon nor Tom made any topographical errors. Carl and Max made the fewest errors, 115 and 62 respectively. Both Carl and Max made all types of errors, except sequence errors. During Initial Probe trials, Jon and Tom made latency errors during probe trials for all library book topics; however Carl and Max's data included latency, duration, and topographical errors. During instruction, Jon, Tom, and Carl made more latency errors during the first library topic than on the following target behaviors. None of the participants made sequence errors.

Social Validity

At the conclusion of the study, social validity data were collected on the perceived outcomes of video modeling as an instructional tool for teaching participants with ASD to locate a library book. Table 12 presents likert scale social validity results. A total of five respondents per participant provided social validity feedback. Mean ratings related to effectiveness of intervention (3.32) and practical implementation of video modeling (3.5) were lower with most respondents reporting an "agree" or "no opinion". One respondent strongly disagreed that video modeling was solely responsible for Max's learning.

Based on social validity forms completed by significant others, participants had access to a computer at home and at school. The participants' teacher reported students had access to a computer for approximately 225 min per week. Social validity forms completed by participants' families indicated participants worked on the computer from 30 min per week (Max) to 180 min per week (Carl). Tom's family reported that he spent 45 min per week on the computer and Jon spent 120 min per week on the computer at home.

The computer used throughout the study, including the computer used for pre – post generalization probe trials included 15 icons. Based on participant social validity feedback, the computers participants used had anywhere from 10 to 15 icons, except the computer used by Tom at home, which had 30 icons located on the desktop. As reported by significant others and professionals, all participants can independently click on computer icons to open preferred computer programs at home and school. All participants have the ability to click on Internet Explorer and use the search features. However, not all participants can spell, so depending on what topic the participants are searching, each would need a visual. It was also reported that all participants could get on the computer and open specific files, open Microsoft Word and type words/sentences, sometimes though, students needed a model.

Participants were asked questions to assess how they liked the procedures and materials and how the liked the target behaviors. All participants responded “yes” that they enjoyed using the *iPod* and watching the video, even Max, who didn’t use the *iPod* or watch any videos. Participants also responded that they liked using the computer and they thought they were good at using the computer. Three participants, Jon, Tom, and Max stated that the video tried to teach them how to watch a movie, but Carl responded accurately, that the video taught him how to look up a book about dogs. Carl’s response makes sense since he only watched the video on how to look up a book about dogs and generalized responding to the other two book topics. Two participants, Jon and Max thought the task was hard and Tom and Carl thought the task was easy. All participants said they thought they were good at using the computer and that they use the computer at home and at school.

CHAPTER 5

DISCUSSION

The primary purpose of this study was to examine the effectiveness of video modeling delivered on an *iPod* to increase participants with ASD ability to use a computerized catalog system to locate library books. A single subject combination design replicated across four elementary school participants diagnosed with autism was used to evaluate the percentage of steps completed accurately. Videos were created in subjective view and downloaded to an *iPod* Nano. During instruction, videos presented the entire task to participants and post video modeling probe trials were conducted to assess percentage of accuracy after instruction. Results from this study demonstrate that participants with ASD have the ability to watch instructional task analyses on portable devices and learn to perform the target behavior. The use of portable devices in this manner is very similar to how people without disabilities would use technology.

Multiple probe opportunity trials were implemented in this study, which allow participants the opportunity to complete the entire task compared to single opportunity probes, in which probe trials are discontinued when the participant makes an error. The benefit of using a multiple opportunity probe trial compared to single opportunity probe trials during initial probes is the ability to capture more valid information because data are collected on all steps of the task analysis. However, a risk associated with the multiple probe opportunity trial is facilitative testing by allowing the participant the opportunity to complete each step in the task analysis. Carl and Max demonstrated acquisition of some or all of the steps in the task analysis by repeatedly being allowed the opportunity to complete each step in the task analysis. A single opportunity probe would have been inappropriate to use because data might not capture the student's ability to sequence topographies already in their repertoire during probe trials. The single opportunity probe might have underestimated the performance for Carl and Max during probes, leading to inaccurate determination of the effectiveness of intervention.

Carl and Max's performance in this study differed from their performance in Hammond, Muething, Ayres, and Gast (in preparation). In Hammond et al., both participants remained at 0% responding during Initial Probe trials, even though a multiple probe opportunity trial was used and an increase in accurate responding was only obtained after introduction of video modeling. Carl and Max responded similarly across tasks though and generalized learned response topographies to similar target behaviors. Difference in responding for Carl and Max could be attributed to history with materials, i.e., more history with the computer than the *iPod*, or familiarity with probe and instructional procedures. Tom's Initial Probe trial responding in Hammond et al., was similar to his responding in this study, however, in this study Tom acquired the target behavior in fewer sessions and generalized to other target behaviors in fewer sessions, presumably due to the similarity of tasks.

Hammond et al. (in preparation) included a verbal prompt at the end of each video model ("Now you do it"), to prompt participants to begin the target behavior. The verbal prompt was removed from the current study to determine if participants who had previously been exposed to the instructional procedure still required the verbal prompt. Carl, Tom, and Max, all participants in a previous video modeling study, did not require a verbal prompt to initiate the task and the task direction was the cue to initiate the behavior. Jon, whom was not included in any previous studies and did not have previous exposure to video modeling as an instructional procedure, required a verbal prompt during one session to initiate the targeted task.

For this study, two video clips were created for each library topic, differing only in the location of the library book selected. During instruction these video clips were randomly alternated so participants would see models of different books being selected. Data were collected on the location of the library book in the video and the location of the book participants selected. Data demonstrate participants did vary book selection and did not perseverate on book location. Anecdotal data were collected and participants were recorded as saying “I want that one”, indicating participants were basing their book selection on which book they wanted instead of on the video model.

An additional observation was made related to the books participants selected. Once a book topic was typed into the search engine, an array of book choices appeared on the computer screen. Some of the books were associated with a photograph of the book cover and others were associated with a general symbol (a white book that was opened). Consistently throughout the study when participants were given the opportunity to select their book, participants always chose a book with an associated visual. During session 38 for Max, accurate responding for the book topic cars, was 89% responding. During this session, when the book options displayed for ‘cars’, none of the books displayed were associated with a visual and Max did not make a book selection within the 5 s, making a latency error.

Limitations

Carl and Max’s learning could be attributed to previously learned response topographies. It is possible that some of the response topographies required for task completion were in their repertoire and the multiple opportunity probe procedure taught both participants the sequence for the target behavior. Both participants have a history of using a computer to conduct an internet search for topics on Google. The target behavior required participants to type a word in the search box and click “go” to search for topics. This series of steps is similar to searching for information on Google, that Carl and Max were able to sequence the steps upon viewing the completed step in the task analysis.

Another possible explanation for learning can be attributed to acquiring the topography of some steps by figuring out how to get to a specific point in the sequence. For example, initially Max did not type the topic into the search box. He was turned around and the word was typed into the search box by the teacher. Afterwards, Max was then repositioned. Between the probe for ‘dogs’ (square) and the probe for ‘cars’ (circle), Max realized that the only difference in the computer screen between step 1 of the TA and step 2 of the TA was the topic word had been typed into the search box. Initially he didn't type the word dogs, or any other word into the search engine, because he didn't know how to respond. However, through repeated probes Max may have learned by looking at the differences between the computer screen on step 1 and step 2 what topography to complete, typing the word into the search box. By cuing into the subtle differences on the computer screen in between each step of the task analysis, Max’s performance increased on each additional probe trial. Similar increase in responding was observed for Carl, particularly for printing the selected book topic.

Prompt dependency is when students always wait for a prompt or cue from an adult before attempting the target skill even when they have already mastered the skill. Possible differences in responding for Jon and Tom compared to Carl and Max could be attributed to each participant's level of prompt dependency, as supported by error analysis. Both Jon and Tom made latency errors only during Initial Probe trials and Jon made an additional two duration errors. Neither participant attempted a step during Initial Probe trials, compared to Tom and Max whom both had topographical errors in addition to latency errors. Jon's data also support this as a probable cause as evidenced by an immediate increase in behavior during session 13, the session after the verbal prompt ("Now you do it"), was provided. After the verbal prompt, Jon met criterion in five sessions.

Anecdotal data support Tom's prompt dependency. Initially, during Post-Video Modeling probe trials (session 19), but subsequently during Daily Probe trials, Tom began to recite each step in the task analysis prior to completing the steps in the TA. Tom continued to repeat the steps in the task analysis through session 42, the completion of the study. During video modeling instruction, Tom also repeated the steps taught during Hammond et al. (in preparation) necessary to operate an *iPod* to watch a movie. Tom's verbal narration of steps leads to questions regarding which had a greater impact on learning, the video model or narrating each step.

Research to Practice

Latency errors were made by both Jon and Tom. Research, as well as practitioners might want to verbally encourage students with ASD to complete as much of the task as possible (i.e., "Do as much of the task as you can.") to reduce latency errors and prompt dependency while completing tasks, which might result in more accurate baseline and instructional data.

Though participants were trained to operate the *iPod*, error correction procedures were developed if participants incorrectly operated the *iPod*. Using the task analysis for navigating the *iPod*, if participants (a) failed to initiate a step within 5 s, (b) failed to complete a step within 10 s, (c) completed the incorrect topography, or (d) performed a step in the task analysis out of order, participants could be provided with a verbal prompt ("Name, you need to step in task analysis"). For example, if participants failed to initiate the first step (press green center button to turn the *iPod* on) in the task analysis of operating an *iPod*, the instructor would provide the prompt "Name, you need to press green center button to turn the *iPod* on". This error correction would be easy and practical to implement if a participant made an error.

Based on acquisition data from Carl and Tom, the multiple probe opportunity trial has implication s for practitioners. Carl and Tom were able to learn most, if not all of the target task by being repeatedly allowed the opportunity to practice steps in the task analysis. Particularly, data from Max demonstrate the potential for students to acquire skills, if provided repeated opportunities to practice the entire task.

Future Research

Future research should compare instructional modalities, video alone, verbal narration alone, or video and verbal combined on rate of acquisition and generalization of behaviors. In addition to examining effectiveness, future research could focus on the social validity of teaching with video alone, assessing whether using video alone would eliminate a participants' narration of each step prior to completion. Future research should also explore the differences in learning using multiple probe opportunity for students who exhibit specific types of errors (latency compared to duration or topographical). Research should also examine participants with ASD and their ability to acquire incidental information via video presented either visually or verbally.

This study documented participants ability to generalize learning to similar behaviors, however, future research could assess when generalization begins to occur. Another interest research question would be if participants with ASD or ID can acquire skills when the complexity of the video model is increased, such as modeling some steps critical to task and some which are not. This study demonstrated that students with ASD have the ability to use technology similar to people without disabilities. Technology has fundamentally changed the way society searches for information (i.e., looking up help topics on portable devices, recording and storing shopping list, etc.) as well as how society communicates with one another (i.e., text messages, e-mail, etc.). With the introduction of portable devices, there has also been an introduction to applications or "apps", which allow people a variety of options which impact independence, such as having an electronic calendar, receiving weather alerts, reading the news, viewing Facebook, listening to music, playing games etc. Research should explore how these recent advancements in technology impact students with disabilities in similar ways to non-disabled students and adults.

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Table 1

Summary of Studies using Video to Teach Functional Skills.

Reference	Participants	Setting/ Arrangement	Independent Variable	Delivery Method	Target Behavior	Dependent Variable	Design
Alberto, Cihak, & Gama (2005)	*Number:* 8 (gender not reported) *Diagnosis:* Moderate intellectual disabilities (N=8) *IQ Range:* 45 - 55 *Age Range:* 11 – 15 yrs	*Setting:* 2 settings. 1: Participants resource room. 2: CBI occurred at local grocery store. *Arrangement:* 1:1	10 cm x 15 cm pictures compared to video (Adult video modeling)	VHS (48 cm television)	Withdrawing $20 from ATM and purchasing two items	1: Percent of correct responses. 2: Number of errors. 3: Number of sessions to acquisition.	AATD
Alcantara (1994)	*Number:*3 (2 males, 1 female) *Diagnosis:* Autism and intellectual disability (N=1); Autism (N=1); intellectual disability and autistic behaviors (N=1) *IQ Range:* 55 (Reported for one participant) *Age Range:* 8 yrs - 9 yrs 11 mon	*Setting:*6 settings: Videotape sessions occurred in 3 settings: 1: School library. 2: Classroom used for science lessons. 3: Room used for meetings and testing. Community probes occurred in 3 settings: 1: Store A, grocery store. 2: Store B, drug store. 3: Convenience store. *Arrangement:*1:1	Videotape instruction and videotape instruction plus in vivo	Videotape (VHS viewed on a television)	Purchasing grocery store items	1: Number of correct steps. 2: Minutes spent per session.	MB across settings and within subjects

Reference	Participants	Setting/ Arrangement	Independent Variable	Delivery Method	Target Behavior	Dependent Variable	Design
Ayres & Cihak (2010)	*Number:* 3 males *Diagnosis:* Moderate intellectual disabilities *IQ Range:* 40-54 *Age Range:* 15 yrs	*Setting:* Participants' resource classroom. *Arrangement:* 1:1	Video modeling followed by computer simulation	Computer	3 Target Behaviors: 1: Making a sandwich. 2: Setting the table. 3: Making soup.	Percentage of correct responding	MP across 3 behaviors and replicated across 3participants.
Ayres & Langone (2002)	*Number:* 3 (1 male, 2 females) *Diagnosis:* Moderate to mild intellectual disabilities (N=1); Moderate to mild intellectual disabilities and Fragile X (N=1); Moderate to mild intellectual disabilities and Down Syndrome (N=1) *IQ Range:* 44 - 59 *Age Range:* 6 yrs 9 mon – 10 yrs 6 mon	*Setting:* 3 settings. 1: Instruction occurred in student's self-contained special education classroom. 2: Community probes were conducted in a national chain grocery store. 3. Computer based probe video footage was conducted in a novel grocery store from community probes. *Arrangement:*1:1	Multimedia-Authorware 4 interactive *Dollar Plus* Software Video prompting (subjective view)	Laptop computer	Paying for purchased items using "Dollar up Method"	Number of trials performed correctly	MP across participants replicated across sets

Reference	Participants	Setting/ Arrangement	Independent Variable	Delivery Method	Target Behavior	Dependent Variable	Design
Ayres & Langone (2007)	*Number:* 4 (2 males, 2 females) *Diagnosis:* Autism *IQ Range:*64-77 (N=2) *Age Range:* 6 yrs 2 mon – 8 yrs 10 mon	*Setting:* 2 settings. 1: In-vivo conducted in teacher's lounge (set-up as kitchen). 2: CAI conducted in participant's classroom. *Arrangement:* 1:1	Authorware Interactive Instruction First person compared to third person video modeling	Computer	Putting away groceries	Number correct	AATD
Ayres, Langone, Boone, & Norman (2006)	*Number:* 4 (3 male, 1 female) *Diagnosis:* Intellectual disability *IQ Range:* 41 - 58 *Age Range:* 14 yrs	*Setting:* 2 settings: 1: Large national grocery chain. 2: Self-contained middle school classroom. *Arrangement:* 1:1	Multimedia Computer based video Instruction (CBVI) incorporating video modeling created in Authorware	Computer	Paying for purchased items using "Dollar up Method"	Accuracy of response	MP across particip ants
Ayers, Maguire, & McCimon (2009)	*Number:* 3 (1 male, 2 females) *Diagnosis:* Autism *IQ Range:* 1 Reported (53) *Age Range:* 7 yrs 7 mon - 9 yrs 6 mon	*Setting:* Multiple locations (home, classroom) *Arrangement:* 1:1	Video modeling followed by computer simulation	Computer and Laptop computer	3 Target Behaviors: 1: Making a sandwich. 2: Setting the table. 3: Making soup.	Percentage of correct responding	MP across 3 behavio rs and replicat ed across 3partici pants.

Reference	Participants	Setting/ Arrangement	Independent Variable	Delivery Method	Target Behavior	Dependent Variable	Design
Bidwell & Rehfeldt (2004)	*Number:* 3 females *Diagnosis:* Severe intellectual disability (N=2), profound intellectual disability (N=1) *IQ Range:* 25 - 29 *Age Range:* 33 yrs - 72 yrs	*Setting:* Classroom of participants' day treatment setting. *Arrangement:* 1:1	Video modeling (Peer model)	Laptop PC Computer	Making coffee	Percentage of steps correct	MB across particip ants
Branham, Collins, Schuster, & Kleinert (1999)	*Number:* 3 (2 male, 1 female) *Diagnosis:* Intellectual disability *IQ Range:* 38 - 48 *Age Range:* 14 yrs - 20 yrs	*Setting:* 3 settings: 1: Classroom simulation occurred participants high school self-contained classroom. 2: Videotape modeling occurred in the living area of self-contained high school classroom. 3: CBI occurred at two local post offices, banks and streets. *Arrangement:* 1:1	Constant time delay (CTD) combined with either (a) videotape modeling, (b) classroom simulation plus CBI, (c) videotape modeling plus classroom simulation plus CBI (peer model)	Video cassette recorder presented on television	3 Target Behaviors: 1: Mailing a letter 2: Cashing a check. 3: Crossing a street	Percent correct steps	MP across behavio rs

Reference	Participants	Setting/ Arrangement	Independent Variable	Delivery Method	Target Behavior	Dependent Variable	Design
Cannella-Malone, Sigafoos, O'Reilly, de la Cruz, Edrishinha, & Lancioni (2006)	*Number:* 6 (5 males, 1 female) *Diagnosis:* Moderate MR (N=1), Moderate MR/Autism (N=2), Mild MR/Autism (N=2), Moderate MR/Asperger's/PDD (N=1) *IQ Range:* 45 - 69 *Age Range:* 27 yrs - 41 yrs	*Setting:* Dining room and kitchen of the participant's vocational center. *Arrangement:* 1:1	Video prompting compared to video modeling (third person modeling)	Mercury Minimerc portable computer	2 Target Behaviors: 1: Setting the table. 2: Putting away the groceries.	Percentage of steps completed correctly	Combination Design (MP combined with AATD)
Charlop-Christy, Le, & Freeman (2000)	*Number:* 5 (4 males, 1 female) *Diagnosis:* Autism *IQ Range:* Not Reported *Age Range:*7 yrs 2 mon – 11 yrs 3 mon	*Settings:* 4 settings total (2 for functional skills) 1: Baseline/Training for self-help skills conducted at clinic's sink. 2: Generalization probes for self-help skills conducted in public restroom near clinic. *Arrangement:*1:1	Video modeling compared to In vivo modeling (adult models)	Videotape presented on a television	Multiple skills, but 2 functional skills for one participant: 1: Brushing teeth (VM). 2: Washing face (In vivo).	Number of correct responses	MB across participants

Reference	Participants	Setting/ Arrangement	Independent Variable	Delivery Method	Target Behavior	Dependent Variable	Design
Cihak, Alberto, Taber-Doughty, & Gama (2006)	*Number:* 6 (males) *Diagnosis:* moderate intellectual disability (N=6), ADHD (Secondary Diagnosis; N=2) *IQ Range:* 36 - 51 *Age Range:* 11 yrs -12 yrs	*Setting:* 2 settings: 1: Simulations occurred in participants' resource room. 2: Community based probes occurred in grocery stores near each group's home school. *Arrangement:* 3:1 group instruction	Video prompting compared to static picture prompts	5 ft 8 in screen	2 Target Behaviors: 1: Purchasing two items. 2: Withdrawing $20 from the ATM.	Percentage of steps correct	AATD
Cihak & Schrader (2008)	*Number:* 4 males *Diagnosis:* Autism *IQ Range:*30-50 *Age Range:* 16-21	*Setting:* 2 settings. 1: In-vivo conducted in teacher's workroom. 2: Participants' school vocational lab. *Arrangement:* 1:1	Video modeling: first person compared to third person video modeling	Laptop computer	4 Target Behaviors: 1: Preparing family packs. 2: Preparing first aid kits 3: Making copies 4: Sending a fax	Percentage of steps completed independently	AATD
Cuvo & Klatt (1992)	*Number:* 6 (gender not reported) *Diagnosis:* moderate intellectual disability (N=5), Mild intellectual disability (N=1). *IQ Range:* 45 - 65 *Age Range:* 13 yrs 0 mon – 17 yrs 10 mon	*Setting:* 2 settings 1: Flashcard and videotape instruction occurred in a classroom adjacent to participant's special education classroom. 2: Community training and testing occurred in various sites nearby (ex: school building, school grounds, three stores in local shopping center). *Arrangement:* 1:1	Comparison of flashcard instruction, videotape instruction and in vivo instruction	VHS	Functional Sight Words (community signs)	1: Percentage of correct anticipations to the mand "What does the sign say?". 2: Percentage of correct anticipations to the mand "What would you do if you saw that sign?".	MB across particip ants

Reference	Participants	Setting/ Arrangement	Independent Variable	Delivery Method	Target Behavior	Dependent Variable	Design
Goodson, Sigafoos, O'Reilly, Cannella, & Lancioni (2007)	*Number:* 4 (males) *Diagnosis:* Autism and Moderate intellectual disability (N=3), Moderate intellectual disability (N=1). *I Q Range:* 40 - 50 *Age Range:* 33 yrs - 36 yrs	*Setting:* Dining area of vocational training center. *Arrangement:* 1:1	Video prompting and video prompting plus error correction (third person view)	Mercury Minimerc portable computer (screen 18.5 cm x 24.5 cm)	Setting the table	Percentage of steps in the table setting task analysis completed correctly.	MB across partici-pants
Graves, Collins, Schuster, & Kleinert (2005)	*Number:* 3 (1 male, 2 females) *Diagnosis:* Down Syndrome (N=1), moderate intellectual disability (N=2) *IQ Range:* 45 - 51 *Age Range:* 16 yrs - 20 yrs	*Setting:* Kitchen area of resource classroom. *Arrangement:* 1:1	Video prompting with CTD built into the video. (subjective view)	25 in. television using VCR	3 Target Behaviors: 1: A stovetop skill of preparing noodles. 2: A microwave skills of preparing macaroni. 3: A countertop skill of making a peanut butter and jelly sandwich.	Percent correct responses	MP across tasks
Hagiwara & Myles (1999)	*Number:* 3 males *Diagnosis:* Autism *IQ Range:* Not reported *Age Range:* 7 yrs 3 mon – 9 yrs 11 mon	*Setting:* Not Reported *Arrangement:* 1:1	Video modeling within the context of a social story	Computer (Mac)	2 Target Behaviors: 1: Washing hands (N=2). 2: On-task behavior (N=1).	1: Percentage of completion (N=2). 2: Averaged duration of on-task behavior (N=1).	MB across settings replica-ted for three partici-pants

Reference	Participants	Setting/ Arrangement	Independent Variable	Delivery Method	Target Behavior	Dependent Variable	Design
Haring, Breen, Weiner, Kennedy, & Bednersh (1995)	*Number:* 6 (5 males, 1 female) *Diagnosis:* Autism (N=3); Severe intellectual disability (N=3) *IQ Range:* Not reported (Vineland ABS Range: 28-58) *Age Range:* 10 yrs – 16 yrs	*Setting:* Multiple settings. 1: One store used for in vivo training. 2: Three stores used for videotape generalization. 3: Three as untrained generalization probe sites. 4: Two to five as novel probe sites. 5. Videotape instruction occurred in participants' homes (N=4) and at a university setting (N=2). *Arrangement:* 1:1	Videotape modeling (peer modeling)	VHS	Purchasing items in a store	Percent correct and cumulative independent purchases	MP across settings
Haring, Kennedy, Adams, & Pitts-Conway (1987)	*Number:* 3 (2 males, 1 female) *Diagnosis:* Autism *IQ Range:* Not Reported *Age Range:* 20 yrs	*Setting:* 4 settings. 1: High school cafeteria (N=2). 2: Convenience store (N=1). 3: Generalization training setting 1: School library (N=2). 4: Generalization training session 2: participant's home (N=1). *Arrangement:* 1:1	SLP was used to instruct participants in target behavior. Video modeling was used during generalization training	VHS (Peer models)	Purchasing skills	Percentage of social and operational steps performed correctly on a task analysis.	MB across particip ants

Reference	Participants	Setting/ Arrangement	Independent Variable	Delivery Method	Target Behavior	Dependent Variable	Design
Kyhl, Alper, & Sinclair (1999)	*Number:* 3 (1 male, 2 females) *Diagnosis:* mild intellectual disability (N=1); moderate intellectual disability (N=2) *IQ Range:* 40 - 55 *Age Range:*16 yrs - 19 yrs	*Setting:* 2 settings. 1: Self-contained high school classroom. 2: Local grocery store across the street from participants high school. *Arrangement:*1:1	Video model	VHS	Community grocery store functional words	Percent correct of functional words	MB across particip ants
Lasater & Brady (1995)	*Number:* 2 (males) *Diagnosis:* PDD (N=1), Autism (N=1) *IQ Range:* 64 - 95 *Age Range:* 14 yrs – 15 yrs	*Setting:* Participants home *Arrangement:* 1:1	Video Modeling	VHS	3 Target Behaviors: 1: Shaving. 2: Making a peanut butter sandwich. 3: Putting shirts on a hanger and hanging in closet.	1: Independent performance rate of steps per minute. 2: Rate of adult prompts.	MB across tasks.

Reference	Participants	Setting/ Arrangement	Independent Variable	Delivery Method	Target Behavior	Dependent Variable	Design
Le Grice & Blampied (1994)	*Number:* 4 (3 males, 1 female) *Diagnosis:* Physical disabilities: Cleft palate (N=1); Epilepsy (N=1) *IQ Range:* 33 - 52 *Age Range:* 13 yrs - 18 yrs	*Setting:* 2 settings: I: Instruction occurred in a small teaching room in the school. 2: Generalization assessed in regular school classroom. *Arrangement:*1:1	Video prompting	VHS viewed on Phillips TV set.	Operation of educational technology (i.e. video recorder and computer).	Number of steps performed correctly	MB across two particip ants
Mechling (2004)	*Number:* 3 (2 males, 1 female) *Diagnosis:* Mild intellectual disability and cerebral palsy (N=1); Moderate intellectual disability and epilepsy (N=1); Autism and mild intellectual disability (N=1). *IQ Range:* 47 - 62 *Age Range:* 13 yrs – 19 yrs 11 mon	*Setting:*2 settings: 1: Instruction occurred at kitchen table in each participant's home. 2: Community based probes occurred at local grocery store approximately 20 min from participant's homes. *Arrangement:*1:1	Multimedia-Computer based video instruction (CBVI) Hyperstudio Video prompting (first-person view)	Laptop computer	Locate grocery items by reading associated words on aisle signs.	Percentage correct during community based probes	MP across particip ants

Reference	Participants	Setting/ Arrangement	Independent Variable	Delivery Method	Target Behavior	Dependent Variable	Design
Mechling & Cronin (2006)	*Number:* 3 (2 males, 1 female) *Diagnosis:* Down syndrome and moderate intellectual disability (N=2); Down syndrome and severe intellectual disability (N=1). *IQ Range:* 36 – 50 *Age Range:*17 yrs 11 mon – 21 yrs 4 mon	*Setting:* Apartment or isolated workroom within the school based vocational program. *Arrangement:*1:1	Multimedia-Computer based video instruction (CBVI) Hyperstudio Video model	Laptop computer	Answering questions and making requests in fast food restaurants.	Percent correct during community based probes	MB across particip ants
Mechling & Gast (2003)	*Number:* 3 (2 male, 1 female) *Diagnosis:* mild intellectual disability and cerebral palsy (N=1); moderate intellectual disability (N=1), moderate intellectual disability and autism (N=1). *IQ Range:* 47 – 62 *Age Range:* 11 yrs 8 mon – 18 yrs 7 mon	*Setting:* 3 settings. 1: instruction occurred in private office of first author. 2: CBI probes were conducted in large grocery store chain (*Kroger*). 3. Generalization probes were conducted in novel grocery store chain (*Publix*). *Arrangement:*1:1	Multi-media instructional package incorporating video. (Hyperstudio)	Laptop computer	Locate grocery items by reading associated words on aisle signs	Percent correct	MP across tasks (word pairs) and replicat ed across three particip ants

Reference	Participants	Setting/ Arrangement	Independent Variable	Delivery Method	Target Behavior	Dependent Variable	Design
Mechling, Gast, & Barthold (2003)	*Number:* 3 (2 males, 1 female) *Diagnosis:* Tourett's syndrome and moderate intellectual disability (N=1); Ataxia and moderate intellectual disability (N=1); Microcephaly, ADHD, articulation difficulties and moderate intellectual disability (N=1). *IQ Range:* 35 - 54 *Age Range:*16 yrs 1 mon – 18 yrs 7 mon	*Setting:* 3 settings. 1: Instruction occurred in secluded conference room at participants' high school. 2: CBI probes were conducted in *Target*, *Harris Teeter*, and *Eckerds*. 3: Generalization probes were conducted *Pet Smart* and *Marshalls*. *Arrangement:* 1:1	Multi-media instructional package incorporating video modeling and video prompting.	Laptop computer	Using a debit card to make purchases using an automatic payment machine (APM)	Percent correct	MP across particip ants
Meching, Gast, & Fields (2008)	*Number:* 3 (1 male, 2 females) *Diagnosis:* Moderate intellectual disability *IQ Range:* 40 - 53 *Age Range:*19 yrs – 22 yrs 3 mon	*Setting:* Apartment rented by the school system for instruction. *Arrangement:* 1:1	Video prompting (subjective view)	Toshiba portable DVD player	3 Target Behaviors: 1: Grilled cheese sandwich. 2: Ham salad. 3: Hamburger Helper Microwave singles.	Percentage of steps performed independently	MP across 3 behavio rs replicat ed across 3 students

Reference	Participants	Setting/ Arrangement	Independent Variable	Delivery Method	Target Behavior	Dependent Variable	Design
Mechling, Gast & Gustafson (2009)	*Number:* 3 (1 male, 2 females) *Diagnosis:* Moderate intellectual disability *IQ Range:* 45 - 56 *Age Range:*19 yrs 3 mon – 21 yrs 3 mon	*Setting:* Kitchen area of apartment rented by university. *Arrangement:* 1:1	Video modeling	Toshiba portable DVD player	3 Target Behaviors: 1: Scooping and releasing flour. 2: Placing a lid on a pot or pan. 3: Using a fire extinguisher.	Percentage of steps performed independently	MP across 3 behaviors replicated across 3 students
Mechling, Gast, & Langone (2002)	*Number:* 4 (1 male, 3 females) *Diagnosis:* Moderate intellectual disability and cerebral palsy (N=1); Moderate intellectual disability and Down Syndrome (N=2); Moderate intellectual disability and autism (N=1). *IQ Range:* 43 - 53 *Age Range:* 9yrs 5 mon – 17 yrs 7 mon	*Setting:* 3 settings. 1: Instruction occurred at each participant's private center or school. 2: Videotape settings included *Kroger*, *Publix*, and *Winn-Dixie*. 3. Generalization probes were conducted at *A&P*. *Arrangement:*1:1	CBVI (Multi-media instructional package incorporating video modeling and video prompting.)	Laptop computer	Locate grocery items by reading associated words on aisle signs.	Number correct	MP across three sets replicated across participants

Reference	Participants	Setting/ Arrangement	Independent Variable	Delivery Method	Target Behavior	Dependent Variable	Design
Mechling, Gast, & Seid (2009)	*Number:* 3 (2 males, 1 female) *Diagnosis:* Autism and moderate intellectual disability (N=1); *IQ Range:* 40 - 75 *Age Range:* 16 yrs 4 mon - 17 yrs 10 mon	*Setting:* Home living room in participants' high school. *Arrangement:* 1:1	Least to most hierarchy incorporating static pictures, auditory prompt and video prompt	Hewlett Packard iPAQ Pocket PC	3 Target Behaviors: 1: Hamburger helper microwave singles. 2: Grilled ham and cheese sandwich. 3: Individual serving size pizza.	Percentage of steps performed independently correct	MP across behaviors.
Mechling & Gustafson (2008)	*Number:* 6 (5 males, 1 female) *Diagnosis:* Autism *IQ Range:* 40 - 64 *Age Range:* 15 yrs 10 mon – 21 yrs 1 mon	*Setting:* Home living center of participants' local high school. *Arrangement:* 1:1	Video prompting compared to static picture prompting	Toshiba portable DVD player	20 cooking related tasks	Percent correct	AATD

Reference	Participants	Setting/ Arrangement	Independent Variable	Delivery Method	Target Behavior	Dependent Variable	Design
Mechling & Gustafson (2009)	*Number:* 6 (3 males, 3 females) *Diagnosis:* Moderate intellectual disability (N=3); Down syndrome and moderate intellectual disability (N=1); Moderate intellectual disability and ADHD (N=1); Moderate intellectual disability, seizure disorder, and ADHD (N=1). *IQ Range:* 40 - 54 *Age Range:* 18 yrs 7 mon – 22 yrs 6 mon	*Setting:* Apartment rented by the school system for instruction. *Arrangement:* 1:1	Video prompting compared to static picture prompting	Toshiba portable DVD player	20 cooking related tasks	Percent correct	AATD
Mechling & O'Brien (2010)	*Number:* 3 (1 male, 2 female) *Diagnosis:* Moderate intellectual disability (N=2); PDD-NOS (N=1) *IQ Range:* 46 - 70 *Age Range:* 19 yrs 2 mon - 20 yrs 11 mon	*Setting:* Classroom or office area at participants training site. Generalization probe sessions conducted in vivo on city bus route. *Arrangement:* 1:1	Video model plus video prompting	Laptop computer with touch screen	Navigating city bus route	Percentage of correct responses	MP across particip ants

Reference	Participants	Setting/ Arrangement	Independent Variable	Delivery Method	Target Behavior	Dependent Variable	Design
Mechling & Ortega-Hurndon (2007)	*Number:* 3 (2 males, 1 female) *Diagnosis:* Moderate intellectual disability (N=2); Down syndrome and moderate intellectual disability (N=1) *IQ Range:* 40 - 54 *Age Range:* 20 yrs 3 mon – 21 yrs 6 mon	*Setting:* 2 settings. 1: Instruction occurred in a small office space on the second floor of the education building on the local university campus. 2: Generalization sessions occurred at the job site within three floors of the university education building. *Arrangement:* 1:1	Video prompting (static photos hyperlinked to video clips of each step in task analysis)	Laptop computer	3 target behaviors: 1: Watering a plant. 2: Delivering mail. 3: Changing paper towels in a student restroom.	Physical completion of the step of the task analysis during generalization sessions at the job site	MP across three tasks replicated with three students
Mechling, Pridgen & Cronin (2005)	*Number:* 3 (2 males, 1 female) *Diagnosis:* Autism and moderate intellectual disability (N=1); Down Syndrome and moderate intellectual disabilities (N=1); moderate intellectual disabilities (N=1) *IQ Range:* 36 – 46 *Age Range:* 17 yrs 1 mon – 20 yrs 2 mon	*Setting:* 2 settings. 1: Instruction occurred in a secluded room in the library of participants' high school. 2: Generalization occurred at three community fast food restaurants (*McDonald's, Wendy's* & *Hardee's*) *Arrangement:*1:1	Computer based video instruction (CBVI) Video prompting	Laptop computer	Verbal responses and use of fast food restaurants.	Percent correct	MP across participants

Reference	Participants	Setting/ Arrangement	Independent Variable	Delivery Method	Target Behavior	Dependent Variable	Design
Mechling & Stephens (2009)	*Number:* 4 (2 males, 1 female) *Diagnosis:* Moderate intellectual disabilities *IQ Range:* 55 – 58 *Age Range:* 19 yrs 9 mon – 22 yrs 6 mon	*Setting:* Kitchen area of an apartment. *Arrangement:* 1:1	Static picture books compared to video prompting	Portable DVD player	6 Target Behaviors: 1: Making hot chocolate. 2: Making ravioli. 3: Making broccoli. 4: Chocolate pudding. 5: Making tuna. 6: Baking french fries.	Percentage of correct responding	AATD
Norman, Collins, & Schuster (2001)	*Number:* 3 (2 males, 1 female) *Diagnosis:* Moderate intellectual disability and Down Syndrome (N=1); Mild intellectual disabilities and Down Syndrome (N=1); Autism, ADHD and moderate intellectual disabilities (N=1) *IQ Range:* Partial Standford-Binet Intelligence Scale (range = 42-59). *Age Range:* 8 yrs 1 mon – 12 yrs 3 mon	*Setting:* Kidney-shaped table in participant's classroom. *Arrangement:* Group instruction (3:1).	Video modeling preview with video prompting (subjective view)	VHS via television	3 Target behaviors: 1: Cleaning sunglasses. 2: Putting on a wrist watch. 3: Zipping a jacket.	Percent correct responses	MP across tasks replicated across participants

Reference	Participants	Setting/ Arrangement	Independent Variable	Delivery Method	Target Behavior	Dependent Variable	Design
Rehfeldt, Dahman, Young, Cherry, & Davis (2003)	*Number:* 3 (2 males, 1 female) *Diagnosis:* Moderate intellectual disability and Down Syndrome (N=1); Severe intellectual disabilities (N=2); *IQ Range:* 24 - 32 *Age Range:* 22 – 37	*Setting:* Kitchen of participants day treatment facility. *Arrangement:* 1:1	Video modeling	Laptop PC (12.5 in x 10 in screen)	Making a sandwich	Percentage of steps correct	MP across particip ants
Shipley-Benamou, Lutzker, & Taubman (2002)	*Number:* 3 (2 males,1 female) *Diagnosis:* Autism *IQ Range:* Not reported. *Age Range:* 5 yrs 1 mon – 5 yrs 5 mon	*Setting:* 2 settings: 1: Instruction conducted in 4.5 ft x 8.5 assessment room. 2: Replication probes were conducted in participants' home. *Arrangement:*1:1	Video modeling (Adult model-subjective view)	21in. television and VHS recorder	4 Target Behaviors: 1: Making orange juice. 2: Setting the table. 3: Feeding a cat. 4: Mailing a letter.	Percentage correct	MP across tasks replicat ed across particip ants

Reference	Participants	Setting/ Arrangement	Independent Variable	Delivery Method	Target Behavior	Dependent Variable	Design
Sigafoos, O'Reilly, Cannella, Edrisinha, de la Cruz, Upadhyaya, et al. (2007)	*Number:* 3 (males) *Diagnosis:* Autism and moderate intellectual disability (N=2); Autism and mild intellectual disability (N=1) *IQ Range:* 45 - 69 *Age Range:* 27 yrs - 33 yrs	*Setting:* kitchen of the vocational training center. *Arrangement:* 1:1	Video prompting (subjective view)	Mercury Minimerc portable computer	Washing dishes	Percentage of steps in the dish washing task analysis that were completed correctly.	MB across participants
Sigafoos, O'Reilly, Cannella, Upadhyaya, Edrishinha, Lancioni, et al. (2005)	*Number:* 3 (males) *Diagnosis:* Moderate intellectual disabilities (N=2); Autism and moderate intellectual disabilities (N=1) *IQ Range:* 43 - 50 *Age Range:* 34 yrs - 36 yrs	*Setting:* kitchen of the participants' vocational program during their mid-morning break *Arrangement:*1:1	Video prompting (subjective view)	Mercury Minimerc portable computer	Making microwave popcorn	Percentage of steps completed independently	Delayed MP across participants
Taber-Doughty, Patton, & Brennan (2008)	*Number:* 3 (males) *Diagnosis:* Moderate intellectual disabilities *IQ Range:* 46 - 57 *Age Range:* 13 yrs - 15 yrs	*Setting:* Branches of the local library in an urban community *Arrangement:*1:1	Video modeling (simultaneous modeling compared to delayed modeling)	30G Apple video *iPod*	Conducting a computer search to locate three different books	Percentage of steps completed independently	Combination design (ATD with withdrawal)

Reference	Participants	Setting/ Arrangement	Independent Variable	Delivery Method	Target Behavior	Dependent Variable	Design
Van Laarhoven, Johnson, Van Laarhoven-Myers, Grider, & Grider (2009)	*Number:* 1 male *Diagnosis:* Chromosomal disorder (moderate intellectual disability) *IQ Range:* 52 *Age Range:* 17 yrs	*Setting:* restrooms/kennel area in an animal shelter *Arrangement:* 1:1	Video prompting	5th generation *iPod*	Cleaning the restroom, mopping the floor/emptying the garbage, cleaning the kennels.	1: Percentage of independent correct responses. 2: Percentage of error correction prompts with video feedback alone. 3: Percentage of error correction prompts with video feedback plus controlling prompt. 4: Percentage of prompts to use technology.	MP across behaviors
Van Laarhoven, & Van Laarhoven-Myers (2006)	*Number:* 3 (2 males, 1 female) *Diagnosis:* Autism and moderate intellectual disability (N=1); Down Syndrome and moderate intellectual disability (N=1); moderate intellectual disability (N=1). *IQ Range:* 35 - 55 *Age Range:* 17 yrs - 19 yrs	*Setting:*2 settings. 1: Instruction occurred in each participant's home or school. 2: Generalization sessions were conducted in faculty lounge (N=1), small conference room /classroom (N=2). *Arrangement:*1:1	Video prompting and video modeling (comparison of video rehearsal, video rehearsal plus photos and video rehearsal plus in vivo. Powerpoint still photos linked to video clips.)	Laptop computer	3 Target Behaviors: 1: Microwaving pizza. 2: Folding laundry. 3: Washing table.	1: Percentage score for level of assistance. 2: Percentage of independent correct responses. 3: Number of prompts to use instructional materials. 4: Number of sessions to reach criteria. 5: Percent score for levels of assistance on measures of generalization.	AATD

Reference	Participants	Setting/ Arrangement	Independent Variable	Delivery Method	Target Behavior	Dependent Variable	Design
Van Laarhoven, Van Laarhoven-Myers, & Zurita (2007)	*Number:* 2 males *Diagnosis:* Mild to moderate intellectual disability *IQ Range:* 47-78 *Age Range:*18 yrs	*Setting:* Participants' employment settings (Red Robin and Applebee's) *Arrangement:* 1:1	Video modeling	Pocket PC	5 Target Behaviors: 1: Rolling silverware. 2: Sorting and sanitizing silverware. 3: Clocking in and out. 4: Portioning recipes. 5: Cleaning and sanitizing workspace.	1: Percentage of independent correct responding. 2: Percentage of prompts. 3: Number of sessions to reach criterion.	MP across behaviors
Van Laarhoven, Zurita, Johnson, Grider & Grider (2009)	*Number:* 3 (1 male, 2 females) *Diagnosis:* Moderate intellectual disability (N=2); Moderate intellectual disability and Down Syndrome (N=1) *IQ Range:* 35 - 55 *Age Range:*12 yrs - 17 yrs	*Setting:* 3 different areas of the school. *Arrangement:* 1:1	Video modeling	Laptop computer	3 Target Behaviors: 1: Cooking a microwave hotdog. 2: Cleaning a bathroom sink. 3: Changing batteries in different devices.	Percentage of correct responding	AATD

Reference	Participants	Setting/ Arrangement	Independent Variable	Delivery Method	Target Behavior	Dependent Variable	Design
Wissick, Lloyd, & Kinzie (1992)	*Number:* 3 (2 males, 1 female) *Diagnosis:* Moderate to severe intellectual disability (N=2); Educable range of intellectual disability (N=1) *IQ Range:* Not reported. *Age Range:*12 yrs - 17 yrs	*Setting:* 2 settings. 1: Instruction occurred in participants' classroom. 2: Community probes were conducted at a local grocery store. *Arrangement:* 1:1	Videodisc interactive simulation	Computer (IBM)	Locate and purchase items in natural convenience store settings.	1: Mean extra actions and percent assistance for assessments in stimulated setting. 2: Mean extra actions for assessments in the natural setting. 3: Correctly completed steps in purchasing for assessments in the natural setting.	MB across particip ants

Note. AATD: Adapted alternating treatments design; ADHD: Attention Deficit Hyperactivity Disorder; MB: Multiple baseline; MP: Multiple probe; MR: Mental Retardation; PDD: Pervasive Developmental Disorder; PPD-NOS: Pervasive Developmental Disorder-Not Otherwise Specified

Table 2

Journals Publishing Studies that used Video

	1987	1992	1994	1995	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
Assistive Technology Outcomes and Benefits													1				1
Behavioral Interventions									1	1							2
Career Development for Exceptional Children					1												1
Education and Training in Autism and Developmental Disabilities (ETADD)			1		1				1		2	3	1		4	1	14
Education and Treatment of Children				1													1
Exceptional Children			1														1
Exceptionality									1						1		2
Focus on Autism and Other Developmental Disabilities (Focus)					1							1					2
Intellectual and Developmental Disabilities																1	1

	1987	1992	1994	1995	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
Journal of Applied Behavior Analysis (JABA)	1	1															2
Journal of Autism and Other Developmental Disorders (JADD)						1									1		2
Journal of Behavioral Education				1							1		1		1		4
Journal of Positive Behavior Interventions								1									1
Journal of Special Education								1				1		1			3
Journal of Special Education Technology		1					1	1		1			1	3			7
Research in Developmental Disabilities											1		1				2
Total	1	2	2	2	3	1	1	3	3	2	4	5	5	4	7	3	45

Table 3

Targeted Tasks Categorized by Disability and Independent Variable

	CBVI	Video Modeling (VM)	Video Prompting (VP)	VM + VP	VM vs VP	VM vs pictures	VP vs pictures	VM + other IV	VM vs other IV	Total
Autism										
Answering questions in a fast food restaurant			1							1
Brushing teeth									1	1
Cleaning sunglasses				1						1
Cooking related tasks							1			1
Feeding cat		1								1
Folding Laundry									1	1
Grocery store words	2									2
Hamburger Helper			1							1
Hanging shirts		1								1

	CBVI	Video Modeling (VM)	Video Prompting (VP)	VM + VP	VM vs VP	VM vs pictures	VP vs pictures	VM + other IV	VM vs other IV	Total
Locating grocery items	2		1							3
Mailing a letter		1								1
Making orange juice		1								1
Making a sandwich			1					1		2
Making copies	1									1
Making soup								1		1
Microwaving a pizza									1	1
Microwaving popcorn			1							1
Navigating city bus system				1						1
Peanut butter and jelly sandwich		1								1
Preparing family packs		1								1

	CBVI	Video Modeling (VM)	Video Prompting (VP)	VM + VP	VM vs VP	VM vs pictures	VP vs pictures	VM + other IV	VM vs other IV	Total
Preparing first aid kits		1								1
Purchasing items		3								3
Putting away groceries		1			1					2
Putting on a wrist watch				1						1
Sending a fax		1								1
Setting the table		1	1		1			1		4
Shaving		1								1
Using a fast food restaurant			1							1
Washing dishes			1							1
Washing face									1	1
Washing hands		1								1
Washing table									1	1
Zipping jacket				1						1
Autism Totals	*4*	*16*	*8*	*4*	*2*	*0*	*1*	*3*	*5*	*43*

	CBVI	Video Modeling (VM)	Video Prompting (VP)	VM + VP	VM vs VP	VM vs pictures	VP vs pictures	VM + other IV	VM vs other IV	Total
Intellectual Disability										
Answering questions in a fast food restaurant	1		1							2
Broccoli (Cooking)							1			1
Cashing a check				1						1
Changing batteries in a device		1								1
Changing paper towels			1							1
Chocolate Pudding							1			1
Cleaning a kennel			1							1
Cleaning a restroom			1							1
Cleaning a sink		1								1
Cleaning sunglasses				1						1

	CBVI	Video Modeling (VM)	Video Prompting (VP)	VM + VP	VM vs VP	VM vs pictures	VP vs pictures	VM + other IV	VM vs other IV	Total
Cleaning workspace		1								1
Clocking in and out		1								1
Community signs									1	1
Cooking noodles			1							1
Cooking related tasks							1			1
Crossing the street				1						1
Delivering the mail			1							1
Emptying the trash			1							1
Extinguishing a fire		1								1
French fries							1			1
Folding laundry									1	1
Grilled Cheese			1							1
Grocery store words	2	1								3
Ham salad			1							1
Hamburger helper			2							2

	CBVI	Video Modeling (VM)	Video Prompting (VP)	VM + VP	VM vs VP	VM vs pictures	VP vs pictures	VM + other IV	VM vs other IV	Total
Hot Chocolate							1			1
Locate grocery items	3		1							4
Locate library books		1								1
Mailing a letter				1						1
Making coffee		1								1
Making request in a fast food restaurant	1									1
Making a sandwich		2	1							2
Making soup		1								1
Microwaving a hotdog		1								1
Microwave mac-n-cheese			1							1
Microwave pizza									1	1
Microwave popcorn			1							1

	CBVI	Video Modeling (VM)	Video Prompting (VP)	VM + VP	VM vs VP	VM vs pictures	VP vs pictures	VM + other IV	VM vs other IV	Total
Navigating the bus system				1						1
Paying for items “dollar up”	2									2
Peanut butter and jelly			1							1
Portioning recipes		1								1
Purchasing items	1	2		1		1	1			6
Putting away groceries					1					1
Putting on a wrist watch				1						1
Ravioli							1			1
Rolling silverware		1								1
Setting the table		1	1		1					3
Sorting silverware		1								1
Tuna (Making)							1			1

	CBVI	Video Modeling (VM)	Video Prompting (VP)	VM + VP	VM vs VP	VM vs pictures	VP vs pictures	VM + other IV	VM vs other IV	Total
Using a fast food restaurant			1							1
Washing dishes			1							1
Washing the table									1	1
Watering plants			1							1
Withdrawing money from the ATM						1	1			2
Zipping jacket				1						1
Intellectual Disability Total	*10*	*18*	*20*	*8*	*2*	*2*	*9*	*0*	*4*	*73*

Note. IV: Independent Variable.

Table 4

Video Delivery Devices by Year

	Television	Projection Screen	Computer	Laptop Computer	Pocket PC	Portable DVD Player	AAC (Mercury Minimerc)	*iPod*
1987	1							
1992	1		1					
1994	2							
1995	2							
1999	2		1					
2000	1							
2001	1							
2002	1			2				
2003				3				
2004				2				
2005	2			1			1	
2006		1	1	2			1	
2007			1	1	1		2	
2008	1			1		2		1
2009			1	2	1	3		1
2010			1	1				
Total	14	1	6	15	2	5	4	2

Note. Ayres et al., (2009) used a computer and a laptop; Taber-Doughty et al. (2008) used an *iPod* and a television.

Table 5

Delivery Devices Categorized by Disability and Intervention

	CBVI	Video Modeling (VM)	Video Prompting (VP)	VM + VP	VM vs VP	VM vs pictures	VP vs pictures	VM + other IV*	VM vs other IV
Autism									
AAC-Mercury Minimerc	--	--	3	--	1	--	--	--	--
Computer	--	2	--	--	--	--	--	1	--
Laptop Computer	2	1	2	1	--	--	--	1	1
Pocket PC	--	--	1	--	--	--	--	--	--
Portable DVD Player	--	--	--	--	--	--	1	--	--
Television	--	5	--	1	--	--	--	--	1
Intellectual Disability									
AAC-Mercury	--	--	3	--	1	--	--	--	--
Computer	2	1	--	--	--	--	--	--	--
iPod	--	1	1	--	--	--	--	--	--
Laptop Computer	4	3	3	2	--	--	--	--	1
Pocket PC	--	1	1	--	--	--	--	--	--
Portable DVD Player	--	1	1	--	--	--	2	--	--
Projection Screen	--	--	--	--	--	--	1	--	--
Television	--	4	1	2	--	1	--	--	1
Physical Disability									
Television	--	--	1	--	--	--	--	--	--

Note. IV: Independent Variable

Table 6

Independent Variables Categorized by Disability

	Autism	Intellectual Disability
CBVI	2	6
Video Modeling (VM)	8	10
Video Prompting (VP)	6	10
VM + VP	2	4
VM vs VP	1	1
VM vs pictures	0	1
VP vs pictures	1	3
VM + other IV	1	0
VM vs other IV	2	2
Total	23	37

Table 7

Articles Categorized by Video Use

Video Modeling	Video Prompting	VM and VP	Set Occasion
Alberto, Cihak & Gama (2005)	Cihak, Alberto, Taber-Doughty & Gama (2006)	Branham, Collins, Schuster, & Kleinert (1999)	Cuvo, & Klatt (1992)
Alcantara (1994)	Goodson, Sigafoos, O'Reilly, Cannella, & Lancioni (2007)	Cannella-Malone, Sigafoos, O'Reilly, de la Cruz, Edrishinha, & Lancioni (2006)	Kyhl, Alper, & Sinclair (1999)
Ayres & Cihak (2010)	Ayres & Langone (2002)	Norman, Collins, & Schuster (2001)	Mechling (2004)
Ayres & Langone (2007)	Ayres & Langone (2007)	Mechling, Gast & Barthold (2003)	Mechling & Cronin (2006)
Ayers, Maguire & McCimon (2009)	Graves, Collins, Schuster & Kleinert (2005)	Mechling & O'Brien (2010)	Mechling, & Gast (2003)
Bidwell & Rehfeldt (2004)	Le Grice & Blampied (1994)		Mechling, Gast, & Langone (2002)
Charlop-Christy, Le, & Freeman (2000)	Meching, Gast, & Fields (2008)		Wissick, Lloyd & Kinzie (1992)
Cihak & Schrader (2008)	Mechling, Gast & Seid (2009)		
Hagiwara & Myles (1999)	Mechling & Gustafson (2008)		
Haring, Breen, Weiner, Kennedy, & Bednersh (1995)	Mechling & Gustafson (2009)		
Haring, Kennedy, Adams & Pitts-Conway (1987)	Mechling & Ortega-Hurndon (2007)		
Lasater & Brady (1995)			
Mechling, Gast & Gustafson (2009)			

Video Modeling	Video Prompting	VM and VP	Set Occasion
Rehfeldt, Dahman, Young, Cherry, & Davis (2003)	Mechling, Pridgen & Cronin (2005)		
Shipley-Benamou, Lutzker, & Taubman (2002)	Mechling & Stephens (2009)		
Taber-Doughty, Patton, & Brennan (2008)	Sigafoos, O'Reilly, Cannella, Edrisinha, de la Cruz, Upadhyaya, et al. (2007)		
Van Laarhoven, & Van Laarhoven-Myers (2006)	Sigafoos, O'Reilly, Cannella, Upadhyaya, Edrishinha, Lancioni, et al. (2005)		
Van Laarhoven, Van Laarhoven-Myers, & Zurita (2007)	Van Laarhoven, Johnson, Van Laarhoven-Myers, Grider, & Grider (2009)		
Van Laarhoven, Zurita, Johnson, Grider & Grider (2009)	Wissick, Lloyd & Kinzie (1992)		

Table 8

Quality Indicators for Video Modeling for ASD

Quality Indicators	Haring et al. (1987)	Alcantara (1994)	Haring et al. (1995)	Lasater & Brady (1995)	Hagiwara, Myles (1999)	Charlop-Christy, Le, & Freeman (2000)
Participants						
Described sufficiently	Yes	Yes	Yes	Yes	Yes	Yes
Selection described sufficiently	No	No	Yes	Yes	No	No
Setting described sufficiently	Yes	Yes	Yes	Yes	Yes	Yes
Dependent Variable						
Described with replicable precision	Yes	Yes	No	No	No	No
Quantifiable	Yes	Yes	Yes	Yes	Yes	Yes
Measurement valid and described with replicable precision	Yes	Yes	No	Yes	Yes	Yes
Measurement occurred repeatedly	Yes	Yes	Yes	Yes	Yes	Yes
IOA data reported and met minimal standards	Yes	No	Yes	Yes	Yes	Yes
Independent Variable						
Described with replicable precision	Yes	Yes	Yes	Yes	Yes	Yes
Systematically manipulated	Yes	Yes	Yes	Yes	Yes	Yes
Procedural fidelity measured and described	No	No	No	No	No	No
Baseline						
Conditions described with replicable precision	Yes	Yes	Yes	Yes	Yes	Yes
Baseline provided evidence of pattern prior to intervention	Yes	Yes	Yes	Yes	Yes	Yes
Experimental Control/Internal Validity						
Three demonstrations of experimental effect	Yes	Yes	Yes	Yes	Yes	Yes
Design controlled threats to internal validity	Yes	Yes	Yes	Yes	Yes	Yes
Pattern that demonstrates experimental control (as judged by visual analysis)	Yes	Yes	Yes	Yes	Yes	Yes

Quality Indicators	Haring et al. (1987)	Alcantara (1994)	Haring et al. (1995)	Lasater & Brady (1995)	Hagiwara, Myles (1999)	Charlop-Christy, Le, & Freeman (2000)
External Validity						
Effects replicated across participants, settings, or materials	Yes	Yes	Yes	Yes	Yes	Yes
Social Validity						
DV socially important	Yes	Yes	Yes	Yes	Yes	Yes
Magnitude of change in DV due to intervention socially important	Yes	Yes	Yes	Yes	Yes	Yes
IV is cost effective	Yes	Yes	Yes	Yes	Yes	Yes
IV implemented over time, in typical context, and by typical intervention agents	Yes	Yes	Yes	Yes	Yes	Yes
Social validity data collected from significant others+	No	No	No	No	No	No
Social validity data collected from participants*+	No	No	No	No	No	No
Indicators met/total indicators	19/23	18/23	18/23	19/23	18/23	18/23

Quality Indicators	Shipley-Benamou, Lutzker, & Taubman (2002)	Cannella-Malone et al. (2006)	Van Laarhoven & Van Laarhoven-Myers (2006)	Ayres & Langone (2007)	Cihak & Schrader (2010)
Participants					
Described sufficiently	Yes	Yes	Yes	Yes	No
Selection described sufficiently	Yes	Yes	No	Yes	Yes
Setting described sufficiently	Yes	No	Yes	Yes	Yes
Dependent Variable					
Described with replicable precision	Yes	Yes	Yes	Yes	Yes
Quantifiable	Yes	Yes	Yes	Yes	Yes
Measurement valid and described with replicable precision	Yes	Yes	Yes	Yes	Yes
Measurement occurred Repeatedly	Yes	Yes	Yes	Yes	Yes
IOA data reported and met minimal standards	Yes	Yes	Yes	Yes	Yes

Quality Indicators	Shipley-Benamou, Lutzker, & Taubman (2002)	Cannella-Malone et al. (2006)	Van Laarhoven & Van Laarhoven-Myers (2006)	Ayres & Langone (2007)	Cihak & Schrader (2010)
Independent Variable					
Described with replicable precision	Yes	Yes	Yes	Yes	Yes
Systematically manipulated	Yes	Yes	Yes	Yes	Yes
Procedural fidelity measured and described	No	No	Yes	Yes	Yes
Baseline					
Conditions described with replicable precision	Yes	Yes	Yes	Yes	Yes
Baseline provided evidence of pattern prior to intervention	Yes	Yes	Yes	Yes	Yes
Experimental Control/Internal Validity					
Three demonstrations of experimental effect	Yes	No	Yes	Yes	Yes
Design controlled threats to internal validity	Yes	No	Yes	Yes	Yes
Pattern that demonstrates experimental control (as judged by visual analysis)	Yes	No	Yes	Yes	Yes
External Validity					
Effects replicated across participants, settings, or materials	Yes	Yes	Yes	Yes	Yes
Social Validity					
DV socially important	Yes	Yes	Yes	Yes	Yes
Magnitude of change in DV due to intervention socially important	Yes	Yes	Yes	Yes	Yes
IV is cost effective	Yes	Yes	Yes	Yes	Yes
IV implemented over time, in typical context, and by typical intervention agents	Yes	Yes	Yes	Yes	Yes
Social validity data collected from significant others+	No	No	No	Yes	Yes
Social validity data collected from participants*+	No	No	No	Yes	Yes
Indicators met/total indicators	20/23	16/23	20/23	23/23	23/23

Note. Criteria for quality indicators as proposed by Horner et al. (2005); IOA = interobserver agreement; DV = dependent variable; IV = independent variable; *=Not applicable if participants were listed as non verbal with no means to answer yes/no questions or provide responses on a Likert Rating Scale; + = Not considered a quality indicator according to of Horner et al. (2005).

Table 9

Participant Descriptives

	Jon	Carl	Tom	Max
Gender	M	M	M	M
Special Education Eligibility	ASD/SI	ASD/SI[a]	ASD/SI	ASD/SI
Age at start of research	9 years, 5 months	10 years, 3 months	10 years	9 years, 6 months
Grade	4th	4th	5th	4th
Ethnicity	Caucasian	Caucasian	Caucasian	Asian
Free or Reduced Lunch	No	No	No	No
Medication	None	Risperdal 2x day	None	None
RIAS[b]				
Verbal	--	108	--	--
Nonverbal	--	107	59	--
Memory	--	--	--	--
Composite	--	109	--	--
DAS[c]				
GLA[d]	--	--	--	45
GCA[e]	--	--	--	45

	Jon	Carl	Tom	Max
KABC-II[f]				
Nonverbal Index	--	--	46 (extremely low)	--
Picture Peabody Vocabulary	--	SS[g] 83 (AE[h]: 7.7)	SS 38 (AE: 2.10)	SS 57 (AE: 4.7)
Expressive Vocabulary Test	--	SS 92 (AE: 9.4)	SS <55 (AE: 3.1)	SS 70 (AE: 5.5)
CARS[i]	--	36 Moderately Autistic	--	--
GARS-II[j]				
Parent	88 (very likely)	94 (very likely)	85 (very likely)	91 (very likely)
Teacher	90 (very likely)	85 (very likely)	87 (very likely)	76 (possibly)
ABAS[k]-General Adaptive				
Parent	--	55	43	54
Teacher	--	66	68	75

(a) SI: Speech Impairment; (b) RIAS: Reynolds Intelligence Assessment Scales; (c) DAS: Differential Abilities Scale; (d) GLA: General Learning Ability; (e) GCA: General Conceptual Ability; (f) KABC-II: Kauffman Assessment Battery for Children 2nd Edition; (g) SS: Standard score ; (h) AE: Age equivalent; (i) CARS: Childhood Autism Rating Scale; (j) GARS-II: Gilliam Autism Rating Scale 2nd Edition; (k) ABAS: Adaptive Behavior Assessment System.

Table 10

Task Analysis

Task Analysis
1. Double click on “media center” icon to open application.
2. Type selected topic from card (if necessary).
3. Press “go”.
4. Select a book.
5. Click “file”.
6. Click “print”.
7. Click “print”.
8. Go get paper from printer.
9. Hand paper to teacher.

Table 11

Efficiency Data: Percentage of Types of Errors on Steps of the Task Analysis for Each Participant and Condition

	Initial Probe				Video Modeling								Maintenance			
					Pre-VM				Post-VM							
	L	D	T	S	L	D	T	S	L	D	T	S	L	D	T	S
Jon																
Dogs	100%	0%	0%	0%	62%	2%	0%	0%	60%	0%	0%	0%	0%	0%	0%	0%
Cars	100%	0%	0%	0%	.9%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Bugs	100%	0%	0%	0%	--	--	--	--	--	--	--	--	0%	0%	0%	0%
Tom													0%	0%	0%	0%
Dogs	100%	0%	0%	0%	9%	0%	0%	0%	17%	0%	0%	0%	0%	0%	0%	0%
Cars	100%	0%	0%	0%	--	--	--	--	--	--	--	--	0%	0%	0%	0%
Bugs	100%	0%	0%	0%	--	--	--	--	--	--	--	--	0%	0%	0%	0%
Carl													0%	0%	0%	0%
Dogs	33%	0%	14%	0%	4%	0%	4%	0%	0%	0%	1%	0%	0%	0%	0%	0%
Cars	35%	1%	14%	0%	--	--	--	0%	--	--	--	--	0%	0%	0%	0%
Bugs	28%	0%	19%	0%	--	--	--	0%	--	--	--	--	0%	0%	0%	0%
Max													0%	0%	0%	0%
Dogs	19%	.9%	4%	0%	--	--	--	0%	--	--	--	--	0%	0%	0%	0%
Cars	10%	2%	6%	0%	--	--	--	0%	--	--	--	--	0%	0%	0%	0%
Bugs	11%	0%	4%	0%	--	--	--	0%	--	--	--	--	0%	0%	0%	0%

Key: (L) = Latency Errors; (D) = Duration Errors; (T) = Topographical Errors, (S) = Sequence Errors; -- = Data not collected because condition was not implemented for participant.

Table 12

Social Validity Likert Scale Data

	Jon	Tom	Carl	Max	Mean Response
1. The identified behavior was important to increase for the participant.	5	4-5 (4.75)	4-5 (4.8)	4-5 (4.6)	4.78
2. Questions regarding the research were answered in a prompt manner and to my satisfaction.	3-5 (4.5)	5	5	3-5 (4.6)	4.75
3. The outcomes, increase participants' ability to navigate/use iPod was significant to the participant.	4-5 (4.75)	5	4-5 (4.8)	3-5 (4.4)	4.73
4. The participant became more independent as a result of instruction.	3-5 (4)	4-5 (4.5)	3-5 (4)	4-5 (4.4)	4.22
5. I now believe the participant is able to learn from video modeling.	4-5 (4.5)	5	3-5 (4.6)	3-5 (4.2)	4.57
6. I believe video modeling was solely responsible for the participants learning.	1-3 (2.5)	3-5 (4)	3-5 (3.8)	1-5 (3)	3.32
7. The video modeling instruction was easy to implement.	3-4 (3.25)	3-5 (3.75)	3-5 (3.6)	3-4 (3.4)	3.5
8. My opinions about using video modeling for instruction purposes have changed.	3-5 (4.5)	3-5 (4.5)	3-5 (4.2)	3-5 (4.2)	4.35

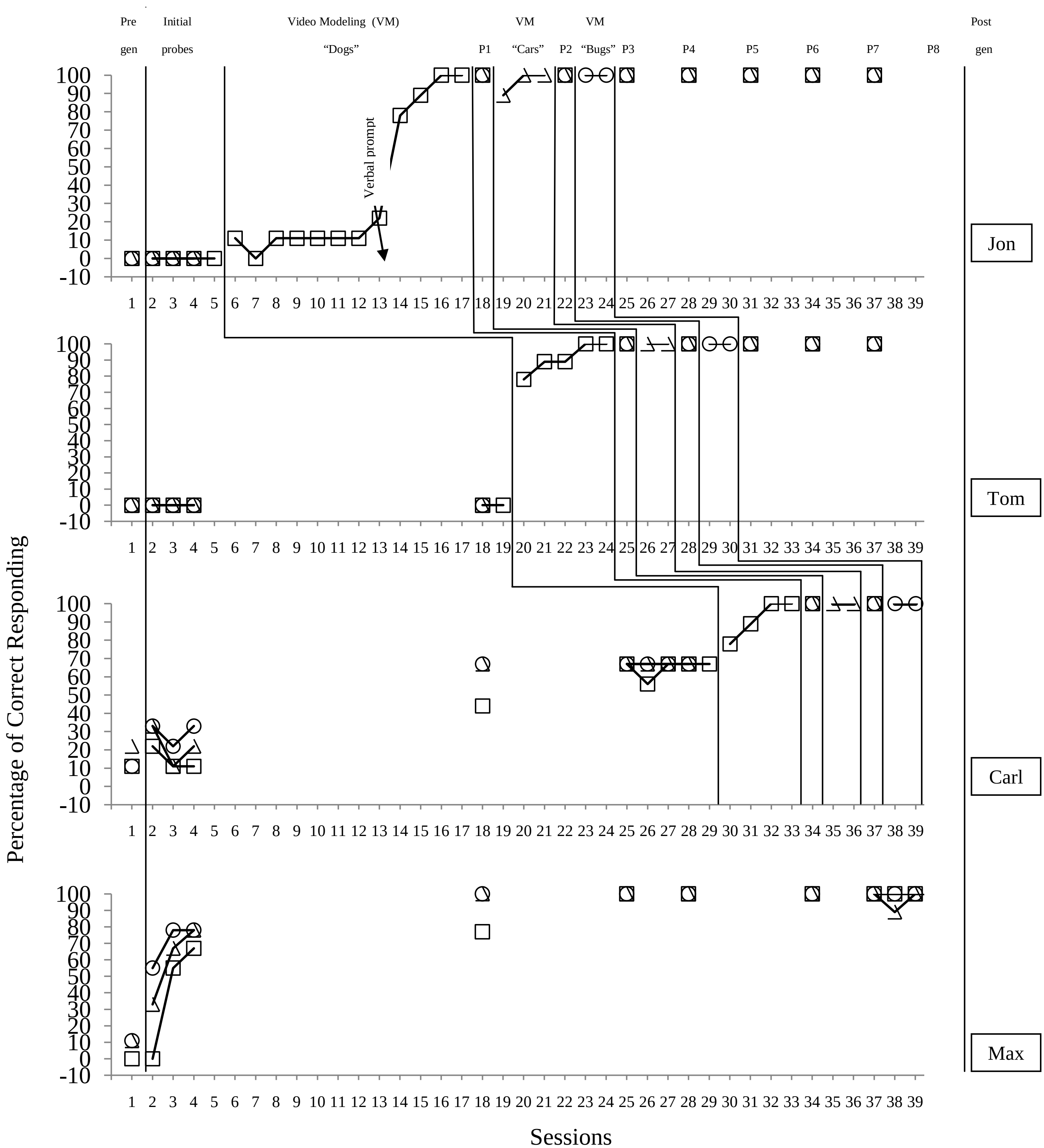


Figure 1. Percentage of Steps Completed Independently for Jon, Tom, Carl, and Max. □ = Daily Probe for book topic "dogs", △= Daily Probe for book topic "cars", ○= Daily Probe for book topic "bugs".

Appendix A

HUMAN SUBJECTS BOARD APPROVAL FORM

The University of Georgia

Office of The Vice President for Research
DHHS Assurance ID No. : FWA00003901

Institutional Review Board
Human Subjects Office
612 Boyd GSRC
Athens, Georgia 30602-7411
(706) 542-3199
Fax: (706) 542-3360
www.ovpr.uga.edu/hso

APPROVAL FORM

Date Proposal Received: 2010-10-15 **Project Number:** 2011-10308-0

Name	Title	Dept/Phone	Address	Email
Dr. David L. Gast	PI	Communication Sciences and Special Education 516 Aderhold Hall +1060 706-542-4561		dlgast@uga.edu
Ms. Diana Linda Hammond	CO	Special Education Aderhold Hall +1060 770-401-3598	908 Lance Circle Lawrenceville, GA 30043	dianah@uga.edu
Ms. Katie A. Smith	CO			katie_a_smith@gwinnett.k12.ga.us

Title of Study: Effectiveness of video modeling delivered via an iPod to teach students with autism to locate library books

45 CFR 46 Category: Expedite 7
Parameters:
Reviewed per Subpart D (46.404): Permission of one parent may be sufficient;
Approved for Institutions with Authorization Letters on File;

Change(s) Required for Approval:
Revised Application;
Revised Consent Document(s);

Approved : 2011-01-25 **Begin date : 2011-01-25** **Expiration date : 2012-01-24**

NOTE: Any research conducted before the approval date or after the end data collection date shown above is not covered by IRB approval, and cannot be retroactively approved.

Number Assigned by Sponsored Programs: **Funding Agency:**

Your human subjects study has been approved.

Please be aware that it is your responsibility to inform the IRB:
. . . of any adverse events or unanticipated risks to the subjects or others within 24 to 72 hours;
. . . of any significant changes or additions to your study and obtain approval of them before they are put into effect;
. . . that you need to extend the approval period beyond the expiration date shown above;
. . . that you have completed your data collection as approved, within the approval period shown above, so that your file may be closed.

For additional information regarding your responsibilities as an investigtor refer to the IRB Guidelines.
Use the attached Researcher Request Form for requesting renewals, changes, or closures.
Keep this original approval form for your records.

Appendix B

PARENTAL INFORMATIONAL LETTER

(Date)

Dear Parents/Guardians:

I invite you to participate in a research study entitled "Video modeling on an *iPod* to teach four elementary school students to find a library book". The purpose of this study is use video modeling on an iPod to teach students functional skills and determine if through the use of the *iPod* children with can be taught functional skills.

Your child's participation will involve viewing a video presentation which depicts how to find a library book using the computerized catalog system and then your child will be asked to perform the skill just viewed. Each session should only take about 20 minutes, four times a week for no more than two months. Your child's involvement in the study is voluntary, and you may choose for them to not participate or to stop at any time without penalty or loss of benefits. Students will be given anonymous names and data will be kept in a locked file cabinet and only accessed by the researcher. The results of the research study may be published, but your child's real name will not be used, rather the anonymous names created will be. Your child's real identity will not be associated his/her data in any published format.

The findings from this project may provide information on the potential benefits of video modeling to teach children with autism and other disabilities functional skills. There are no known risks or discomforts associated with this project.

If you have any questions about this research project, please feel free to call me at 678-301-7163 or send an e-mail to Diana_Hammond@gwinnett.k12.ga.us. You can also contact Katie Smith at (770) 985-0244 or send an e-mail to Katie_A_Smith@gwinnett.k12.ga.us.

By completing and returning the consent form, you are agreeing to allow your child to participate in the above described research project.

Thank you for your consideration! Please keep this letter for your records.

Sincerely,

Diana Hammond
Instructional Coach

Katie Smith
Special Education Teacher

Appendix C
PARENTAL PERMISSION FORM

PARENTAL PERMISSION FORM

I, _________________________________, agree to allow my child participate in a research study titled "Effectiveness of video modeling delivered via an iPod to teach students with autism to locate library books." conducted by Diana Hammond, doctoral candidate, Department of Communication Sciences and Special Education, University of Georgia, under the direction of Dr. David Gast, Department of Communication Sciences and Special Education (706-542-5069). I understand that my child's participation is voluntary. My child can refuse to participate or stop taking part without giving any reason, and without penalty or loss of benefits to which my child is otherwise entitled. I can ask to have all of the information about my child returned to me, removed from the research records, or destroyed.

The reason for this study is to evaluate whether children with moderate ASD can learn functional skills through the use of video modeling delivered on an iPod. Individual sessions will be conducted four to five times per week, one session per day, with each participant. All probes, baseline, intervention, and maintenance, will occur in the morning between the hours of 9:00 AM and 12:00 noon and consist of one trial. Each session lasts no more than 20 minutes, including video modeling during intervention probes. If I allow my child to take part in this study, he/she will be asked to do the following things:

1) Complete a preference assessment will take 10 minutes.
2) Complete an iPod assessment will take 10 minutes.
3) Complete iPod training to learn how to navigate the iPod and access videos of the functional skills.
4) Learn a functional skill of importance to him/her.
5) Someone from the study will always be available to answer any questions about the study.
6) My child's information will be kept confidential and all data will be reported using pseudonym names.
7) The link between pseudonym and child's real name will be destroyed immediately after all data for the study has been collected. Data sheets containing partiticipants pseudonyms will be kept for three years post data collection of the study.

The benefits for my child are that he/she may learn additional recreation/leisure and functional skills using video modeling. The researcher hopes to learn more about the effectiveness of video modeling delivered using portable devices and how technology can be used to benefit children with autism.

No risk is expected. No individually identifiable information about my child, or provided by my child during the research, will be shared with others without my written permission or if required by law. My child will be assigned a pseudonym name and this name will be used to collect and report all collected data.

The investigator will answer any further questions about the research, now or during the course of the project.

I understand that I am agreeing by my signature on this form to allow my child to take part in this research project and understand that I will receive a signed copy of this consent form for my records.

Diana Hammond/Katie Smith __________________________ ___________

Name of Researcher Signature Date

Telephone: 678-301-7163 / *770-985-0244*
Email: *Diana_hammond@gwinnett,k12.ga.us* or *Katie_A_Smith@gwinnett.k12.ga.us*

____________________________ __________________________ ___________

Name of Parent Signature Date

Please sign both copies, keep one and return one to the researcher.

Additional questions or problems regarding your child's rights as a research participant should be addressed to The Chairperson, Institutional Review Board, University of Georgia, 612 Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411; Telephone (706) 542-3199; E-Mail Address IRB@uga.edu

Appendix D

STUDENT ASSENT FORM

Student Assent Form

I would like to see if you would be willing to help me with a research project about using an iPod. I will ask you to use the iPod to watch a video. Then, I will ask you to show me how to do the task you saw on the iPod.

If you decide to help me, your answers to my questions will be kept just between you and me. I may not be able to keep this promise if you tell me that you or another child is being hurt in some way, or if a judge asks me for some information. If that were happening, I would tell someone to help keep you or the other child safe. You can stop helping me with the project at any time.

Do you have any questions? Would you be willing to do the project with me?

____

Child’s signature

Appendix E
ADULT CONSENT FORM

ADULT CONSENT FORM

I, ________________________________, agree to participate in a research study titled "Effectiveness of video modeling delivered via an iPod to teach students with autism to locate library books." conducted by Diana Hammond, doctoral candidate, Department of Communication Sciences and Special Education, University of Georgia, under the direction of Dr. David Gast, Department of Communication Sciences and Special Education (706-542-5069). I understand that my participation is voluntary. I can refuse to participate or stop taking part at anytime without giving any reason, and without penalty or loss of benefits to which I am otherwise entitled. I can ask to have all of the information about me returned to me, removed from the research records, or destroyed.

The reason for this study is to evaluate whether children with moderate ASD can learn functional skills through the use of video modeling delivered on an iPod. Individual sessions will be conducted four to five times per week, one session per day, with each participant. All probes, baseline, intervention, and maintenance, will occur in the morning between the hours of 9:00 AM and 12:00 noon and consist of one trial. Each session lasts no more than 20 minutes, including video modeling during intervention probes. If I volunteer to take part in this study, I will be asked to do the following things:

1. Answer questions about my perceptions of the goals of the research topic, which will take 3 minutes
2. Answer questions about my perceptions of the outcomes of the research topic, which will take 3 minutes
3. Answer questions about my perceptions of the procedures of the research topic, which will take 3 minutes
4. The questions above will be asked in the form of survey, using a Likert-Scale (1-5) and your responses will be anonymous.
5. Someone from the study may call me to clarify my information
6. My information will be kept and I will be contacted in 5 years for a follow-up

There are no direct benefits, however my responses will provide feedback on instructional strategies to teach students with ASD additional recreation/leisure and functional skills using video modeling. The researcher hopes to learn more about the effectiveness of video modeling delivered using portable devices and how technology can be used to benefit children with autism.

No risk is expected, but I will have to complete a survey with no more than 10 questions, which will take a total of 10 minutes to complete. I will be asked to rate my opinion using a Likert Scale, using a rating scale of 1-5. I will receive no incentives for answering questions at the end of this study.

No individually-identifiable information about me, or provided by me during the research, will be shared with others without my written permission, except if it is necessary to protect my welfare (for example, if I were injured and need physician care) or if required by law. I will be assigned an identifying number and this number will be used on all of the questionnaires I fill out.

The investigator will answer any further questions about the research, now or during the course of the project.

I understand that I am agreeing by my signature on this form to take part in this research project and understand that I will receive a signed copy of this consent form for my records.

Diana Hammond/Katie Smith ______________________ __________
Name of Researcher **Signature** **Date**
Telephone: 678-301-7163/*770-985-0244*
Email: *Diana_hammond@gwinnett,k12.ga.us* or *Katie_A_Smith@gwinnett.k12.ga.us*

__________________________ __________________________ ____________

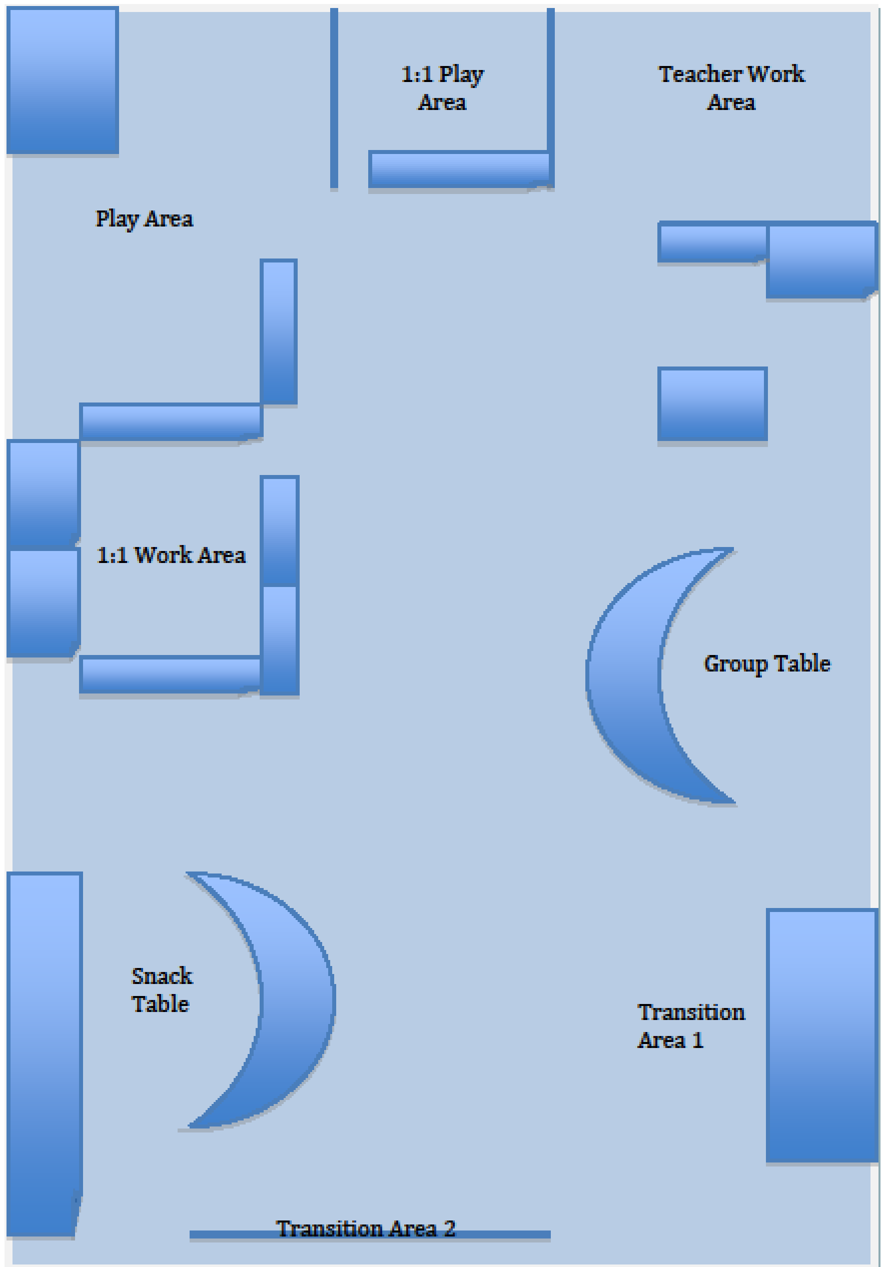
Name of Parent Signature Date

Please sign both copies, keep one and return one to the researcher.

Additional questions or problems regarding your rights as a research participant should be addressed to The Chairperson, Institutional Review Board, University of Georgia, 612 Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411; Telephone (706) 542-3199; E-Mail Address IRB@uga.edu

Appendix F
CLASSROOM ARRANGEMENT/DESIGN

Physical Layout



Appendix G

SCREEN SHOT OF MEDIA CENTER ELECTRONIC CATALOG


Destiny Quest - Windows Internet Explorer
http://mediacatalog/vopac/servlet/presentsearchform.do;jsessionid=943476BE359651A9A9EA951648D9F6E4?site=179
File Edit View Favorites Tools Help
Quest Home Login My Info Exit Destiny Quest
Destiny Quest
Find: Enter your search here
Go!
Advanced Search
Pharr ES Media Center
Hello, Guest!
My List
Titles: 0
Drag Drop
The Top 10 Books
1 2 3 4 5 6 7 8 9 10
The 100th customer
E KIM
Resource Lists
Most Recent
Search 1 List
Civil War
New Arrivals!
1 Outrageous ores 6/4/2010
2 Rain and floods 6/4/2010
3 The Earnhardt NASCAR dynasty 6/4/2010
4 Scooby-Doo! and the creepy chef 6/4/2010
5 Does an apple a day keep the doctor away? 6/4/2010
NEXT
Done
Local intranet
100%
start
4:21 PM

Appendix H

DATA SHEET: *IPOD ASSESSMENT*

Participant: ____
iPod Assessment/Training Data Sheet

Directions: Code (+) if the step was completed independently. Code (-) if the step was not completed or the participant did not complete action independently. Afterwards, calculate the percent of independence (+).

Time														
Date														
Observer Initials														
7. Hand iPod to teacher.														
6. When movie is finished, press "play/hold" button on iPod for 2 s to shut off.														
5. Watch and wait until movie is finished														
4. put thumb on “menu” button, scroll clockwise until movies is highlighted, press green button.														
3. press green button again with thumb to open “Movies” menu														
2. put thumb on “menu” button, scroll clockwise until "videos" is highlighted and press green button.														
1. press green center button to turn the iPod on														
Session														
% of Independence														

Key: (+): Correct (initiate with 5 s complete within 10 s); (-) Incorrect (no initiation within 5 s or not completed within 10 s)

Incorrects Code:
(T): Incorrect behavioral response
(L): If error was latency error, no initiation within 5 s.
(D): step in TA not completed within 10s.
(S): Steps of the TA were performed out of order from teaching sequence.

Appendix I

DATA SHEET: PROBE/INSTRUCTION

Participant: ____

Directions: Code (+) if the step was completed independently. Code (-) if the step was not completed or the participant did not complete action independently. Afterwards, calculate the percent of independence (+).

Time														
Date														
Observer Initials														
Topic														
9. Hand paper to teacher.														
8. Go get printed paper from printer.														
7. Click "Print".														
6. Click "Print".														
5. Click "File"														
4. Select a book.														
3. Press go.														
2. Type selected topic from card (if necessary).														
1. Double click on "media center" icon to open application.														
Session														
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Book location														
% of Independence														

Key: (+): Correct (initiate with 5 s complete within 10 s); (-) Incorrect (no initiation within 5 s or not completed within 10 s)

Incorrects Code:

(T): Incorrect behavioral response

(L): If error was latency error, no initiation within 5 s.

(D): step in TA not completed within 10s.

(S): Steps of the TA were performed out of order from teaching sequence.

Appendix J

PROTOTYPE OF EXPERIMENTAL DESIGN

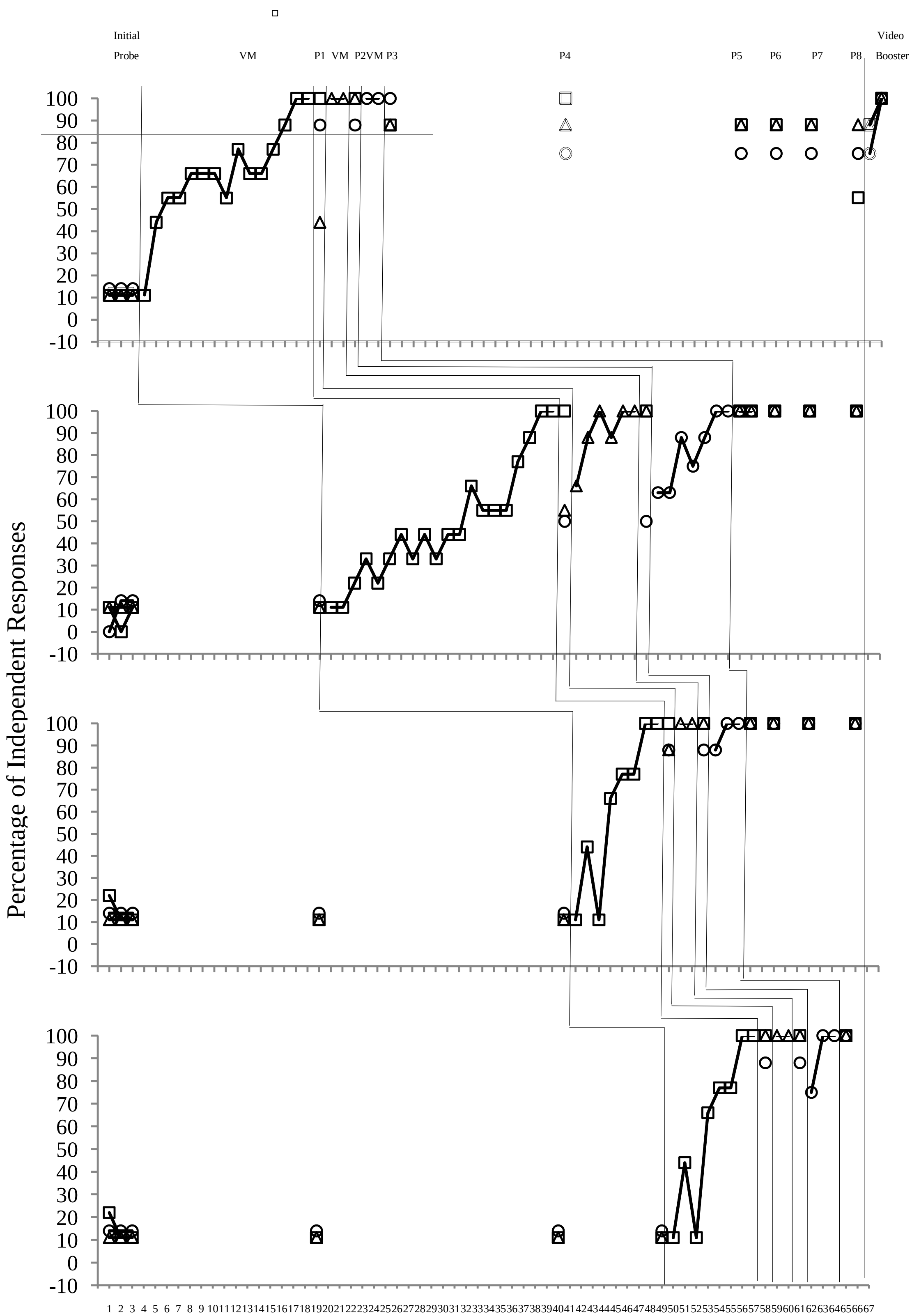


Figure 1.

Sessions

Appendix K
PROCEDURAL RELIABILITY: INITIAL PROBE TRIALS

Procedural Reliability – Pre-Post Generalization and Probe Trials

Participant: ____

Task: ____

Directions: Please put a (+) next to each step the researcher conducts according to protocol. If a step is omitted or incorrectly performed, please put a (-) next to step.

(+): Instructor followed procedures

(-): Instructor did not follow procedures

Date					
Session					
Observer Initials					
1. No adult prompts were provided during baseline.					
2. Participant was positioned correctly during initial probe trials.					
3. Correct task direction provided.					
4. Participant was given 5 seconds to initiate response.					
5. Participant was given 10 seconds to complete task.					
6. If student makes error,					
(a) Student turned away from materials,					
(b) Teacher completes step in TA					
(c) Student repositioned correctly.					
(d) Student given 5 s to initiate next step in TA.					
7. No additional reinforcement/preferred items provided.					
Total Number of (+):					
Percentage:					

Appendix L
PROCEDURAL RELIABILITY: INSTRUCTION

Procedural Reliability - Intervention

Participant: ____

Task: ____

Directions: Please put a (+) next to each step the researcher conducts according to protocol. If a step is omitted or incorrectly performed, please put a (-) next to step.

(+): Instructor followed procedures

(-): Instructor did not follow procedures

Date					
Session					
Observer Initials					
1. No adult prompts were provided during baseline.					
2. Participant was positioned correctly during video modeling sessions/probes.					
3. Task direction “Watch this” provided.					
4. Participant was given 5 seconds to initiate response.					
5. Participant was given 10 seconds to complete task.					
6. Correct movie on iPod was selected.					
7. If student makes error,					
(a) Student turned away from materials,					
(b) Teacher completes step in TA					
(c) Student repositioned correctly.					
(d) Student given 5 s to initiate next step in TA.					
8. No additional reinforcement/preferred items provided.					
Total Number of (+):					
Percentage:					

Appendix M

SOCIAL VALIDITY: PARENTS/PROFESSIONAL(S)

Social Validity: Significant Others/Professionals Form

Participant Name: ____

Please complete the following survey and return it to Katie Smith. Circle or write the response which corresponds with the way which best describes how you feel about each statement below.

Survey Questions

1. During the 2010-2011 school year did this student have access to a computer at home/school?

Yes No

2. If yes, approximately how many minutes per week does the student interact with the computer?

____

3. If student has access to computer, approximately how many icons are on the desktop?

____

4. What level of support does the student require to complete the following?

Task	**Code**					
a) Excluding the media center catalog icon, what level of support does the student need to click on computer icon to open up internet or other computer program?	Indepen-dent	Visual	Verbal	Gesture	Model	Physical
b) What level of support does the student need to type words or topics into a Google or another search engine to look for information on topics?	Indepen-dent	Visual	Verbal	Gesture	Model	Physical
c) What level of support does the student need to print pages off the computer to a printer?	Indepen-dent	Visual	Verbal	Gesture	Model	Physical

5. What skills can the student independently complete on the computer (ex. open up specific files, open up the internet, open up Microsoft word and type, open songs from the iTunes menu, etc.)

____

____

____

____

---

6. In your opinion, please rate the students' computer skills by circling one of the following:

Beginner Intermediate Advanced

Scale: 1=strongly disagree, 2 = disagree, 3=neutral, 4=agree, 5=strongly agree

The identified behavior was important to increase for the student.	1	2	3	4	5
Questions regarding the research were answered in a prompt manner and to my satisfaction.	1	2	3	4	5
The outcomes, increase participants ability independently find a book in the library using the computerized catalog system was significant to the student.	1	2	3	4	5
The student became more independent as a result of instruction.	1	2	3	4	5
I now believe the student is able to learn from video modeling.	1	2	3	4	5
I believe video modeling was solely responsible for the student's learning.	1	2	3	4	5
The video modeling instruction was easy to implement.	1	2	3	4	5
My opinions about using video modeling for instructional purposes have changed.	1	2	3	4	5

Appendix N
SOCIAL VALIDITY: PARTICIPANTS

Social Validity: Participants

1. Did you like using the *iPod*?
2. Did you like watching the video?
3. What did the video try to teach you?
4. Did the video help you learn how to look up a book?
5. Did you get the chance to pick out books that you like?
6. Was looking up a book easy or hard?
7. Did you like using the computer?
8. Do you think you are good with the computer?
9. Do you use the computer at home or at school?