Effects of Self-Directed Video Prompting Using iPads on the Vocational Task
Completion of Young Adults with Intellectual and Developmental Disabilities

Dissertation

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Abstract

Individuals with intellectual and developmental disabilities struggle to find integrated employment because of their challenges with vocational task acquisition and completion. In this study, self-directed video prompting on iPads was used with three male participants with intellectual and developmental disabilities. A multiple probe across tasks design was used to determine the effects of the intervention on the accuracy of vocational task acquisition in integrated employment settings. Prior to intervention with self-directed video prompting in the integrated employment setting, a multiple probe across participants design was used to determine the effects of a training package for teaching iPad usage consisting of modeling and least-to-most prompting on a training task. All three participants acquired device usage in two to five trials. The participants all acquired three vocational tasks in the course of the study and demonstrated generalization to new materials, settings, or people in two of their three tasks.

Dedicated to my sisters and nieces, an amazing gift from God!

I pray your journey in life takes you to college.

I expect it from you all!

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Fields of Study

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Chapter 1: Introduction

Employment is an integral part of daily life for most adults. In addition to promoting economic self-sufficiency, employment also provides other benefits such as opportunities for social interaction and interpersonal relationships, active engagement in the community, and acceptance as a valued member of the community (Kiernan, Hoff, Freeze, & Mank, 2011). In fact, one's identity is often aligned to employment as evidenced by frequent conversations about employment when meeting new people (Kiernan & Mank, 2011). However, this valued identity is often one not experienced by people with intellectual and developmental disabilities (IDD). The National Longitudinal Transition Study 2 (NLTS-2) found that only about 38% of people with IDD are employed eight years after graduation, compared to 66% of similarly-aged peers without disabilities (Newman et al., 2011).

The employment gap among youth with disabilities, especially those with IDD, historically has been a persistent challenge for educators and vocational service providers, as evidenced by the number of people with IDD who are unemployed or employed in sheltered workshops (Butterworth, Hall, Smith, Migliore, & Winsor, 2011). Sheltered employment workshops can be problematic because (a) they cost four times as much as integrated community employment, (b) they provide an artificial work environment with a narrow possibility for real jobs in the workshop, and (c) there are frequent unproductive blocks of time throughout the day without work (Kiernan & Mank,

2011; Rogan & Rinne, 2011). In addition, the average salary of employees in sheltered workshops is more than 10 times lower (\$25 per week) compared to the average salary (\$271 per week) of employees in integrated settings (Butterworth et al., 2011).

Furthermore, the matriculation from sheltered workshops to integrated employment is around 3.5%, so employees placed in sheltered workshops have limited opportunities to experience the social contingencies that naturally accompany engagement and membership in a community, but are subjected to lifelong placement in separate, unequal employment settings (Butterworth et al., 2011; Kiernan & Mank, 2011; Rogan & Rinne, 2011).

Fortunately, the disability rights movement, along with Employment First initiatives, has advocated for systems change to increase integrated employment for people with significant disabilities and decrease the number of placements in sheltered employment. Twenty-five states, including Ohio, have signed this initiative that includes 15 guiding principles and also calls for systems of supports to enable people with disabilities to overcome the common challenges they face in integrated employment (Kiernan et al., 2011). The guiding principles are a point of conversation among policy makers, self-advocates, and practitioners and focus on everything from basic disability awareness to the evilness of exploitation of people with disabilities in the workplace.

The most relevant of these 15 principles for this paper are Principles 3, 4, 11, and 13 as follows:

3. Work for pay (employment) is a valued activity both for individuals and society. While providing both tangible and intangible benefits, employment helps people achieve independence and economic self-

sufficiency, giving purpose, dignity, self-esteem, and a sense of accomplishment and pride.

4. It is presumed that all individuals with disabilities, including those with the most significant disabilities, can achieve competitive integrated employment with appropriate services and supports.

11. Service providers are expected to use best, promising, and emerging practices with respect to the provision of employment-related services and supports.

13. Supports should be provided for as long as needed, with a focus on use of natural occurring supports as much as possible. (Kiernan et al., 2011, 300–301)

The emphasis of the above principles is on the importance of employment and the system of supports to facilitate opportunities for successful employment for people with IDD. Therefore, the focus of this study is on the system of supports for integrated employment. More specifically, this research focuses on supports involving the use of technology-mediated self-prompting to access opportunities for successful employment. The technology-mediated self-prompting supports focus on addressing the common challenges that people with IDD experience in integrated employment settings.

For example, Mechling and Ortega-Hurdon (2007) identified common challenges in employment as: (a) following step-by-step directions that require listening to directions and completing them in the specified order, (b) retaining the job task (i.e., the ability to remember tasks taught previously), (c) failing to complete tasks in a required sequence

(e.g., cleaning the dining room may require taking out the trash before sweeping the floor, otherwise trash may get on the floor while taking the trash out), and (d) transitioning from task to task independently (i.e., moving from one task to another without assistance between a series of tasks such as shelving journals, sorting mail, and checking in books at a library job).

Previous research has shown that people with significant disabilities and support needs can succeed in integrated employment if afforded customized supports that are designed to remediate these challenges (e.g., Browder & Minarovic, 2000; Cihak, Alberto, & Frederick, 2007; Mechling & Ortega-Hurdon, 2007). One such customized support to increase independence and accuracy in the workplace is self-prompting (e.g., Mechling & Ortega-Hurdon, 2007), an antecedent-based self-management strategy in which a participant manages his/her own prompts, which can be visual, audio, and/or technology-based combination supports (Mechling, 2007). In integrated employment settings, self-prompting supports have been demonstrated to be an effective tool to help participants acquire new tasks (e.g., Copeland & Hughes, 2000; Frank, Wacker, Berg, & McMahon, 1985; Lancioni, O'Reilly, & Oliva, 2001), stay on task (e.g., Cihak et al., 2007), transition between tasks (e.g., Carson, Gast, & Ayres, 2008; Taber, Alberto, & Frederick, 1998), and assist with using appropriate social skills in a vocational setting (Cihak et al., 2007).

Although self-directed video prompting has been shown to be effective for vocational and daily living tasks in both school-based and day program settings, it has been evaluated in integrated employment settings in only four studies (i.e., Cihak et al., 2008; Kellems & Morningstar, 2012; Van Laarhoven, Van Laarhoven-Myers & Zurita,

2007; Van Laarhoven, Johnson, Van Laarhoven-Myers, Grider, & Grider, 2009). One additional study (i.e., Bereznak, Ayres, Mechling, & Alexander, 2012) utilized an iPhone for vocational and daily living tasks in the teacher workroom and kitchen with mixed results. Therefore, the purpose of the study was to increase the independence of adults with intellectual and developmental disabilities (IDD) in integrated employment settings by teaching them to use an iPad with the My Pics Talk app for self-prompting of vocational tasks.

The following research questions guided this study: (a) What are the effects of video self-prompting using iPads on the percentage of vocational task steps completed accurately by young adults with IDD in integrated employment settings?; (b) What are the effects of video self-prompting using iPads on the generalization of vocational tasks?; (c) What are the effects of training young adults to use an iPad with modeling and least-to-most prompting on the task accuracy and correct navigation of a training task? (d) What are participants' and job coaches' opinions about the use of self-directed video prompting of vocational tasks in integrated employment settings?

Chapter 2: Review of the Literature

Success for individuals with intellectual and developmental disabilities (IDD) in integrated employment settings is contingent on learning strategies that assist them to overcome the common challenges in community work settings. The challenges completing tasks in integrated employment settings may include difficulty following directions, remembering how to do the job task, completing tasks in the proper sequence, and transitioning from task to task independently. Following directions requires employees to pay attention to verbal or written directions, complete tasks step-by-step, and if necessary, seek assistance. Memory retention is the ability to remember previously taught tasks that were shown 5 minutes ago (short term) or 5 months ago (long term). Completing tasks in sequence requires employees to complete tasks in a certain order to ensure the best outcomes. All of the aforementioned expected behaviors involve quality assurance and control of the timely delivery of products, goods and services to the public. For example, cleaning the dining room requires wiping tables before sweeping the floor to prevent crumbs from getting on the floor after it has been swept. Transitioning from task to task independently means switching from one task to another without assistance. For example, a job in a library may require the employee to engage in a series of tasks such as shelving journals, sorting mail, and checking in books. When employees cannot transition independently, they need some type of prompting to go to the next task, which results in decreased productivity for the individual or entire department, depending on the employee's job duties.

Previous research has shown that people with significant disabilities and complex support needs can succeed in integrated employment if afforded customized systems of supports that are designed to remediate challenges (Browder & Minarovic, 2000; Burke, Anderson, Bowen, Howard, & Allen, 2010; Cihak, Alberto, & Frederick, 2007; Mechling, 2011; Mechling & Ortega-Hurdon, 2007; Rogan & Rinne, 2011; Van Laarhoven et al., 2009). Customized supports range from job coaching, to self-management supports such as visual and audio supports, to natural supports.

Mank, Cioffi, and Yovanoff (1997) define natural supports as any assistance, relationship, or interaction that helps a person in integrated employment. However, this assistance occurs in equivalent ways as the routines and methods used with other employees. For example, a coworker assigned to clean dining rooms, teamed with another employee who has a disability and uses a checklist to complete tasks, may have to verbally direct the employee with the disability, if an unfamiliar situation arises while cleaning the dining rooms that is not covered by the checklist used by all employees. Planning for natural supports has been shown to be a cost effective augmentation to long-term job coaching (Cimara, 2007).

Job coaching commonly consists of facilitating a person with IDD with acquiring the skills to complete assigned job tasks, assisting the consumer with understanding and appropriately responding to various environmental contexts and cues, and identifying needed systems of support. Typically, one-on-one instruction from the job coach is how the participant with IDD is taught the tasks required to complete the job (Mchugh, Storey, & Certo, 2002). Although using job coaches for consumers with IDD for training and acclimation to a new work environment has helped improve the employment outcomes of

people with IDD, there remain some difficulties with its implementation. For example, job coaches often lack skills in including supervisors and coworkers as natural supports during training, thereby, failing to create a system of natural supports and opportunity for full integration (Bennette, Brady, Scott, Dukes, & Frain, 2010). In addition, some job coaches have difficulty determining when to fade support, and begin removing themselves from the employee with the disability. Some job coaches may lack the skills to teach job tasks systematically and often end up completing work tasks for the employee. Thus, the job coach may actually hinder the employability of individuals with IDD by preventing them from becoming a fully integrated and independent worker. Moreover, a challenge with both natural supports and job coaching is that they require dependence on others to ensure success on the job. A method that can reduce reliance on others and promote independence is training clients to use self-management interventions that utilize technology-mediated self-prompting.

Self-Management

Self-management strategies can help improve outcomes for integrated employment (Mechling & Ortega-Hurdon, 2007). One self-management strategy that can assist in allowing people with disabilities to become more independent in integrated employment is self-monitoring of task completion and independent task transitions. However, self-monitoring procedures must fit the environment, tasks, and needs of the participants (Martin, Elias, Berger & Mithaug, 1987).

Self-management is the regulation of one's behavior to solve problems, set and meet goals, and arrange stimuli to assist with meeting those goals (Harchik, Sherman, & Sheldon, 1982). Self-management strategies can be antecedent-based supports or

consequent-based supports (Browder & Shapiro, 1985). Antecedent-based supports are supports that include visual or auditory cues that signal the person to what he or she is going to do for a task. In contrast, consequent-based supports are used after completing the task, and often help individuals self-monitor what tasks they have completed (Mechling, 2007). Consequent-based supports can include self-recording, self-reinforcement, and self-assessment. Some tools utilized in self-assessment are checklists, technology-based supports, numeric counters, or other tools.

Self-management supports that have been effective in employment settings include self-instruction, self-monitoring, self-reinforcement, and self-prompting (Lagomarcino, Hughes, & Rusch, 1989). Self-instruction is a self-management strategy in which the participants learn verbal reminders to use as antecedent cues to prompt their own behavior. When utilizing self-instruction, participants made self-directive statements to guide their behavior. In the past, general statements such as whether to work slowly or quickly have been effectively utilized in employment settings. Self-instruction using specific targeted statements relating to the task, such as stating the steps of the task while they are completed has also been an effective management strategy in employment settings (Harchik, Sherman, & Sheldon, 1992). Participants are taught these statements while learning a task, and then are directed to continue making them when performing the task in the future.

Self-monitoring is a self-management strategy in which participants observe their own behavior and then record their performance of the behavior (Storey, 2007). Grossi and Heward (1998) used self-monitoring with four adults with intellectual disabilities in restaurants as a means to increase work production. Participants recorded the amount of

work they did such as number of dishes washed, or the time taken to complete a task such as mopping the floor. Three of the four participants increased their work production rates, and all four participants increased their accuracy.

Another antecedent form of self-management is self-prompting. More specifically, self-prompting is a cue that reduces reliance of participants on external people such as coworkers and job coaches to provide textual prompts, picture prompts, video prompts, or computer-based instruction, to complete tasks (Ayres & Cihak, 2010; Briggs et al., 1990; Van Laarhoven, Kraus, Karpman, Nizzy, & Valentino, 2010). The strategies of self-prompting, once acquired by a participant, can then be applied to a variety of settings and tasks as a tool to increase success (Martin, Elias-Berger, & Milthaug, 1988). In a study conducted by Carson, Gast, and Ayres (2008), a photo book of cleaning and vocational tasks was used by high school students with intellectual disabilities in school-based and vocational settings. Prior to the study, the participants were able to complete the tasks independently, but were unable to transition between the tasks without external prompting. The photo book served as the self-prompting strategy used to prompt for the next task in the sequence. All participants increased the number of independent transitions during intervention, in comparison to baseline.

Self-Prompting

An understanding of prompts used in self-prompting is necessary before considering how self-prompting might be conducted with technology. Appropriate uses of technology mediated self-prompting in employment tasks will take into account several important factors to promote optimal outcomes for participants. These factors include training procedures for people with disabilities to acquire the knowledge and

skills to utilize the technology, the setting in which the task is performed, characteristics of participants, types of prompts used, tasks used, and the fading and generalization procedures. Prior to discussing technology mediated self-prompting, it is important to consider what is known about the types of prompts that have been used for self-prompting and what technology devices are available to deliver that prompt. More specifically, the types of self-prompting available include audio supports, visual supports, and/or technology-based combination supports (Mechling, 2007). Early self-prompting interventions in vocational settings consisted of visual supports including low-tech textual and picture prompts.

Visual Supports

Visual supports are tools frequently used to provide support to consumers with disabilities. These supports include natural environment cues, tools created to support individuals to promote success in their environments, high tech devices to support language, visual supports to promote understanding of daily routines and schedules, and supports to assist in easing adjustment to new experiences or changes in routine such as social stories (Hayes, 2010). Forms of visual supports include textual, picture, and video supports and are described below.

Textual supports. Textual supports are written supports designed to help students self-manage task completion (Browder & Minarovic, 2000), transition between tasks (Minarovic & Bambara, 2007), and/or exhibit specific behaviors at a given time (Burke et al., 2010). Forms of written supports used in self-management may include checklists, performance cards, or technologically delivered cueing systems (Burke et al., 2010). Purely textual supports have not yet been investigated using technology, but it

has been a component utilized in conjunction with picture prompting. However, textual supports have been used in low-tech form. Minarovic and Bambara (2007) utilized sight word checklists to promote transitions between tasks with three adults with moderate intellectual disabilities in community-based integrated employment. Participants utilized the checklists as an antecedent and consequent based self-management strategy.

Participants utilized the checklists in an antecedent manner when they looked at the checklist to see what task to do first, or in subsequent tasks what needed to be done next. When participants completed a task, they checked off that they had completed it as a consequent self-management strategy. All three participants showed increased ability to complete tasks, and transition between them independently.

Picture prompting. Picture prompts are photos, line drawings, or other pictorial cues used as visual supports for communication, choice making, prompting, or visual schedules. Picture prompts have been used to promote task acquisition and completion (Agran, Fodor-Davis, Moore, & Martella, 1992; Copeland & Hughes, 2000; Frank, Wacker, Berg, & McMahon, 1985; Mechling & Gustafson, 2009; Sanders & Parr, 1989; Wacker & Berg, 1993), and independent transition between tasks (Carson, Gast & Ayres, 2008; Cihak, Kessler, & Alberto, 2008; Copeland & Hughes, 2000; Sowers, Verdi, Bourbeau, & Sheehan, 1985). Picture prompts that are technology-based have been used in conjunction with audio prompts, or as a fading technique utilized with video prompts. Picture prompts have also been an effective support utilized in its low-tech form. Irving and colleagues (1992) utilized a picture schedule as a self-prompting tool for home and school-based cleaning and organizational tasks for participants with intellectual disabilities. All participants increased their independent completion of tasks in both

settings. Similarly, Mechling and Gustafson (2009) used picture prompts in cooking recipes for six students with intellectual disabilities. Participants utilized the recipes to prompt completion of individual steps. Participants increased the number of steps completed correctly, but only to around 50% from baseline levels of 0 to 20%. Only getting 50% of a recipe correct, though, could create challenges with the quality of the food and potentially hazardous food safety concerns. Mechling and Gustafson (2009) concluded that picture prompts were effective, but that pairing pictures with additional supports, such as audio or video, may be a more effective intervention.

Audio Supports

Self-prompting interventions for vocational tasks expanded beyond low-tech forms of picture and textual supports to provide audio supports. Audio supports are prerecorded supports or covert audio cues given to consumers who self-operate the cues utilizing audio technology such as cassette players, CD players, or MP3 players (Taber, Alberto, & Frederick, 1998). Audio supports generally have time between directions to allow consumers to complete the task given, or a direction to pause the recording. Audio supports have been used to help consumers acquire a new task (Lancioni et al., O'Reilly, 2001), improve social skills and reduce problem behavior (Cihak, Alberto, & Frederick, 2007), help consumers stay on task (Cihak et al. 2007), and transition between tasks (Taber et al., 1998). For example, Mitchell, Schuster, Collins, and Gassaway (2000) investigated the usage of audio prompts in a single subject multiple probe design across three behaviors that was replicated across three participants. The participants were middle school students with mild intellectual disabilities completing prevocational tasks that

included cleaning a mirror, sink, and toilet. All participants acquired the tasks quickly, and were able to generalize the skill to a novel bathroom.

Picture Plus Audio Supports

Although audio supports were effective, an extension of the literature to include audio plus picture supports also emerged. In audio plus picture prompts, an audio prompt is simultaneously played when a picture is shown. Technology-mediated self-prompting devices using picture plus audio prompts promote the acquisition and completion of vocational and/or daily living tasks (Lancioni, Van den Hof, Boelens, Nelson, & Seedhouse, 1998; Mechling & Gast, 1997; Riffle et al., 2005; Soldner, Rehfeldt, Guercio, & Dillen, 2005). For example, Mechling and Gast (1997) used a Digivox AAC device as a picture plus audio prompting device with two participants with moderate intellectual disabilities in a reversal design. The effects of the prompts on steps completed correctly on two food preparation tasks by the two participants were investigated. Both participants completed significantly more steps correctly when using the device, than when they did not use the device. Participants also generalized the use of the device to new materials and settings.

Video Supports

Although audio and picture supports are effective in promoting acquisition of vocational and daily living tasks, static pictures and audio prompts cannot always capture the actions required to complete a task, so video may represent a more effective medium for these tasks (Kellems & Morningstar, 2012). Video supports has been used to teach cooking and daily living skills (Mechling & Gustafson, 2009; Sigafos et al., 2007), vocational tasks (Allen, Wallace, Renes, Bowel & Burke, 2010; Van Laarhoven et al.,

2009), technology skills (Kagohara, 2011; Legrice & Blampied, 1994; Zisimopulous, Sigafoos, & Koutromanos, 2011), and social and communication skills (Cihak, 2010; Tetreault & Lerman, 2010).

Video prompting was utilized by Van Laarhoven et al. (2010) in an alternating treatments design comparing video and picture prompts. Video prompts were utilized to teach two middle school students with mild to moderate intellectual disabilities how to fold laundry and to cook pasta. Video prompting was found to promote independent task completion, and to require fewer external prompts than picture prompts required.

In a similar study, Cannella-Malone et al. (2011) compared video modeling with video prompting in an adapted alternating treatments design with students with moderate to severe intellectual disabilities. In video modeling, participants watched a video of the whole task and then completed the task. In video prompting, the participant watched one step of the task, completed that step, and then repeated the process until all the steps of the task were completed. Video prompting was found to be a more effective procedure than video modeling for teaching cleaning and cooking tasks to the participants. Increased accuracy as well as independence occurred with video prompting, whereas some participants showed little to no improvement using video modeling.

Video supports can be a valuable tool in promoting acquisition of tasks. Tiong, Blampied, and Le Grice (1992) found that some advantages to video prompting were that the movement contained in videos increased attention to the important stimuli, and that the presentation of the task in real time helped promote acquisition (as cited in Mechling & Gustafson, 2009). Recently, video prompts have been increasingly used with mobile technology, and are being paired with other supports on the devices.

Technology-Based Combination Supports on Mobile Devices

Technology-mediated self-prompting devices that pair two or more of the self-prompting supports including textual, picture, audio, and video prompts have been an effective support in vocational settings to promote task acquisition and completion (Cihak, Kessler & Alberto, 2008; Davies, Stock & Wehmeyer 2002; Kellem & Morningstar, 2012; Riffel et al., 2005; Van Laarhoven et al., 2007; 2009). In one example of technology mediated self-prompting supports, Van Laarhoven et al. (2007) utilized a pocket PC to prompt completion of vocational tasks in a competitive community-based employment program. The study used a multiple probe across tasks design that was replicated across two adolescents with mild or moderate intellectual disabilities. Both participants worked in restaurants in the community. The tasks targeted included clocking in and out, food preparation, and cleaning tasks. Video modeling for each task was created by having coworkers instruct the participants on the steps of the task as the participant performed it. The percentage of correct steps increased from baseline levels of 0 to 10% to 90 to 100% during intervention. In addition, the percentage of external prompts needed from job coaches decreased from 50% of intervals during baseline to 0 during intervention. Thus, the use of the pocket PC with video models increased both accuracy and independence.

In another study using a video iPod with an adolescent with moderate intellectual disabilities in a vocational setting, Van Laarhoven et al., (2009) found that combining video with audio provided optimal support for the participant and promoted successful task completion. The participant often watched the video for the step, then put the iPod in his pocket and listened to the audio while he performed the step of the task.

Another way to combine video with other supports is to consider the use of textual and/or audio prompts that are modified to match the functional reading levels of the participants. Kellems and Morningstar (2012) used self directed video prompting paired with audio prompts for two young adults with autism and intellectual disabilities and reading difficulties; and video paired with textual prompts for two young adults with autism, but not intellectual disability or reading difficulties. A functional relation between the video prompting and improved performance of vocational tasks was demonstrated in a multiple baseline across tasks design. Additionally, the participants maintained the acquired vocational tasks over time. Considering the individual characteristics and abilities of participants and adapting the intervention to meet these needs likely was impactful in the successful implementation of the intervention.

Identifying the Right Technology for Prompting

When developing self-prompting interventions, once a prompt type has been selected, it is important to consider what devices could effectively deliver that prompt in the most unobtrusive manner. A variety of devices and procedures have been used in technology mediated self-prompting interventions. In early studies, tape recorders served as the technology for audio prompts (e.g., Lancioni, et al., 2001; Mitchell et al, 2000; Taber-Doughty et al., 1998). More recently, computers and laptops have also been utilized as a tool for self-prompting (Cannella-Malone et al., 2011; Soldner et al., 2005). When using computers, a variety of software has been used for self-prompting including Powerpoint, Project Shop software, I Can Daily Living Skills software, and Hyperstudio. More recently, Personal digital assistants (PDA's) and mobile technology been successfully used as technology mediated self-prompting supports for a variety of tasks

and settings (e.g., Cihak et al., 2008; Ferguson, et al., 2005; Mechling Gast, & Seid, 2010; Mechling & Savidge, 2011; Riffel et al., 2005). Specific mobile technology devices used for technology-mediated self-prompting include iPods, iPads, and iPhones (Bereznak et al., 2012; Brady, 2011; Kellem & Morningstar, 2012; Payne, Cannella-Malone, H. I., Tullis, C. A., & Sabielny, L. M. (2011; Van Laarhoven et al., 2009; Wu, 2011).

Benefits of Technology Mediated Self-Prompting Supports

Technology mediated self-prompting has many benefits for people with IDD in integrated employment settings including increased independence in task completion, accuracy, and transitioning between tasks.

Independence

Previous research has found that the use of technology-mediated self-prompting increases independence in employment by reducing reliance on external prompts (Cihak, Kessler, & Alberto, 2007; Riffel et al, 2009). Riffel et al. (2009) found that by utilizing a palmtop PC with self directed visual and auditory prompts, four high school participants who had intellectual and developmental disabilities were able to more independently complete the vocational tasks of setting a table and rolling silverware. The number of external prompts decreased to levels equivalent to typical coworkers. Cihak et al. (2007) also found increased independence when utilizing a handheld prompting support system that paired audio and pictorial cues to prompt independent task completion in community-based settings. All four students in this study increased their percentage of independently completed steps from a mean of 7% correct to a mean of 69% correct. Davies, Stock, and Wehmeyer (2002) utilized a personal digital assistant as a self-

directed visual and audio prompting system called Visual Assistant in two vocational tasks with ten adults with moderate to severe intellectual disabilities. All of the adult participants increased their task accuracy and decreased the number of external prompts needed to complete the designated tasks. Self-prompting can increase not only independence, but also accuracy.

Accuracy

Technology-mediated self-prompting can help participants complete vocational tasks more accurately (Cihak, Kessler, & Alberto, 2009; Horn et al., 2008; Mechling & Gustafson, 2009; Van Laarhoven et al., 2009; Wu, 2011). Mechling and Gustafson (2009) compared the use of picture prompts to video prompts in cooking tasks delivered on a portable DVD player for six adolescents with intellectual disabilities in the completion of cooking tasks in an adapted alternating treatment design that had a baseline phase, follow up withdrawal phase, and a final treatment phase. The video prompting on a portable DVD player was more effective for five of the six participants, and equally effective as picture prompts for the sixth participant, thereby showing that video prompting delivered on portable electronics can serve as sufficient support to enable independent accurate completion of cooking tasks. Similarly, Van Laarhoven et al. (2007) utilized a pocket PC to prompt completion of vocational tasks in a competitive community-based employment program in a multiple probe across tasks design that was replicated across two adolescents with mild or moderate intellectual disabilities. Both participants worked in restaurants in the community. The tasks targeted included clocking in and out, food preparation, and cleaning tasks. Video modeling for each task was created by having coworkers instruct the participants on the steps of the task as the

participant performed each task. The percentage of correct steps increased from baseline levels of 0 to 10% to 90 to 100% during intervention. In addition, the percentage of external prompts needed from job coaches decreased from 50% of intervals to 0 during intervention.

Independent Transitions

Technology-mediated self-prompting can increase the independent transitions between tasks and independence in schedule following in school-based, clinic-based, and employment settings (Ferguson, 2005; Gillette & Depompei, 2008; Soldner, Rehfeldt, Guercion, & Dillen, 2005; Wu, 2011). Personal digital assistants (PDA's) can provide an organization and memory tool to assist students with intellectual disabilities and traumatic brain injury to manage activities of daily living (Gillette & Depompei, 2008). In a four-week trial with 35 adolescents and adults that had an intellectual disability or an acquired brain injury, the use of lists, planners, and PDA's were compared as memory aids for daily tasks. The perceptions of consumers and their families were also evaluated. The participants had to complete eight daily tasks at designated times throughout the day. Students completed more of the tasks at the correct time when utilizing the PDA, then when using the list or planner.

Soldner et al. (2005) utilized a similar intervention with a PowerPoint based schedule with a 20 year-old patient at a rehabilitation facility for adults with acquired brain injuries in an AB design. Momentary time sampling was used to assess on task and on schedule compliance. The participant increased on task and on schedule compliance from baseline percentages of 0 to intervention percentages of 90 to 100 percent. By utilizing technology to self-prompt transitions to the next activity, the participant was

able to complete a series of cleaning tasks, cooking tasks, and hygiene tasks independently.

Increases in independent transitions, when utilizing a handheld prompting system, were also found in a study by Cihak et al. (2008) with three high school students with moderate to severe intellectual disabilities. The participants were provided a handheld prompting system with auditory and pictorial prompts to help them self-manage transitions between known vocational tasks in a vocational preparation high school class. A multiple probe across participants design was used, and participants increased the number of independent transitions from baseline levels of 0% to 100% during intervention with the device. They maintained the high percentages of independent transitions for nine weeks when the study ended. Acceptability of the intervention by both supervisors and the students was demonstrated in the social validity assessments. Specifically, they identified the use of the PDA scheduling program to be a valuable tool, because it was adaptable to workers with different needs and difficulties.

Other applications of technology mediated self-prompting have also been shown to be an acceptable intervention to key stakeholders in vocational settings including supervisors, coworkers, and workers with disabilities (Kellems & Morningstar, 2012). In addition, social validity assessments of video prompting showed supervisors and coworkers saw improvement in both the quality and speed of work, and a decreased need for external prompting (Ferrerias et al., 2010).

Procedures for Effective Self-prompting Interventions

Self-prompting interventions have a general procedural sequence for development of the prompts. First, the setting and tasks have to be identified. Then a task analysis must

be developed. Next, prompts must be developed, taking into consideration the setting, participant characteristics and job assignment. Finally, the procedures for training participants on the use of the technology, modifying prompts as needed, and programming for maintenance and generalization of the skills must be developed.

Task analysis

Self-prompting interventions require a clear delineation of the steps of a task. A key strategy to delineate the task is the development of a task analysis. A task analysis is a complex skill that is broken down into smaller, teachable steps that are sequential in nature (Cooper, Heron, & Heward, 2007). Task analyses have been used and included in previous research involving technology mediated prompting. Using a different task analysis may confound the results of the replication study. In considering self-prompting and self-instruction interventions, it is also significant to have the task analysis because it helps you know how the original researchers grouped steps together. For example, the statement that the task had 11 steps does not tell you whether each step consisted of only one action or more than one action. In a task like mopping the floor, one researcher may have “put the mop in the water”, “squeeze the water out of the mop”, and “take the mop to the area you are mopping” as one step, whereas another researcher may put each one of those actions into a separate step. Payne et al. (2012) recommended that each step for technology mediated self-prompting should contain only one discrete behavior (e.g., put mop in water) as opposed to multiple behaviors (e.g., put mop in water, squeeze out water and take mop to proper area). Once the task analysis is completed, prompts are recorded, and saved into the appropriate technology device.

Training Methods and Data on Training Accuracy

Importance of training methods. Once prompts are created and saved onto the appropriate technology device, then training methods must be selected to adequately teach participants on both the use of the device and completion of the tasks. As part of training methods, correct navigation must be taught to participants. Acquisition of skills to properly navigate devices can be one of the most challenging aspects of technology use for people with intellectual disabilities (Lopez, Fortis, & Garcia, 2009). Errors in performance of the task may occur because of errors in navigating the prompting support system. Thus, planning, implementing and evaluating the participant's correct navigation skills, prior to introducing the support in the employment setting, is essential to successful use of technology-mediated self-prompting supports in the natural environment.

Training methods. Training methods used to promote acquisition of correct navigation of the technology is an important factor that is under discussed in the literature. Often there is mention that the participant was taught to use the technology, but no specifics are given and no data are collected on participants during training. The primary focus, during pre-planning, must focus on teaching the use of the technology; that is, identifying corrective prompting methods while using the technology, determining technologically sound pre-intervention training steps prior to introduction in the employment setting, and selecting non-targeted tasks to teach and evaluate the correct navigation of the device.

Pre-intervention training. Pre-intervention training occurs before implementation of the intervention at the site in which the task is to be completed or in

another location, and can promote successful acquisition of the use of the technology (Cihak et al., 2008; Taber-Doughty, 2005; Van Laarhoven et al., 2007; 2010). Pre-intervention training in other locations is a strategy often used for integrated settings where the applied nature of the setting may make it difficult to train the use of the technology in that setting (Taber-Doughty, 2005). Utilizing non-target tasks is a method in which participants are taught technology use by either navigating through familiar tasks on the device while completing them, or one new task is taught that is not the targeted task for intervention. Utilizing new non-target tasks to teach technology use can promote successful acquisition of technology use (Mechling, 2007; Mechling, Gast, & Fields, 2008; Van Laarhoven et al., 2010). Van Laarhoven, utilized the non-target task of cleaning a desk to teach the use of self-prompting with PowerPoint on mobile technology.

Corrective prompting. In corrective prompting while using the technology, the participant is prompted by external means if they make a mistake in navigating the technology (Lancioni, Oliva, Pellegrino, & Soresi, 1999). Corrective prompting has been effectively used to train use of technology-mediated self-prompting devices (Lancioni et al., 1999; Lancioni et al., 2001; Payne et al., 2012; Van Laarhoven et al., 2007; Wu, 2011). Wu (2011) used corrective prompting to stop participants, and redirect them using a “least to most” prompting sequence, first verbal, then gestural, then physical prompts in order to correctly navigate the technology.

Procedures of training methods. One challenge with evaluation of the effectiveness of training methods is the lack of a designated criterion of accuracy and the lack of data from previous studies showing the effectiveness of the technology training

prior to beginning intervention (Wu, 2011). This represents a limitation, because we do not know how well the participant learned to navigate the technology (Wu, 2011). The use of a criterion of accuracy before beginning intervention is a strategy that should also be used to show effectiveness of training methods. Criterion of accuracy includes setting a level at which participants must be able to navigate the technology prior to beginning intervention (Taber-Doughty, 2005). In a few previous studies with technology mediated self-prompting, a criterion of accuracy required before beginning intervention or data on navigation usage throughout the study was included in the procedures (i.e., Taber-Doughty, 2005; Van Laarhoven et al., 2010). For example, in a study conducted by Taber-Doughty (2005), an accuracy rate of 90% on navigation was required prior to beginning intervention. In another study, Van Laarhoven et al. (2010) required participants to independently navigate and complete familiar tasks using the technology for three consecutive sessions, prior to using the technology for new tasks. Including detailed descriptions of training procedures utilized in an intervention allow for others to replicate the findings and increase the reliability of the findings (Horner et al., 2005). In addition, a few studies with technology mediated self-prompting include accuracy of navigation as a dependent variable (i.e., Payne et al., 2012 Wu, 2011).

Task Clustering and Fading Strategies

Once technology mediated self-prompting has been implemented, modifying prompts may be necessary. Mechling (2007) concluded that a prompting support system should be advanced enough to allow modifications to match the changing needs of the learner so that independence can be maximized. Supports in employment settings must be individualized around the student's needs and fit the settings in which they work for

optimal success to occur (Storey, 2007). An effective alternative to fading prompts in a vocational setting is to have the consumer identify their own self-prompting strategy, and then adjust their strategy to match the incremental steps towards task mastery (Carmine, 2005; Lancioni, 2001). Some recommended modifications may include adjustments with learning the steps of a task, prompts reduction, and clustering multiple steps under one prompt (Mechling, 2007).

Changing levels of prompts. Changing levels of prompts can include the fading of video prompts to photos (Mechling, Gast, & Seid, 2010; Van Laarhoven & Van Laarhoven-Myers, 2006;); fading video/in vivo to video/photos, and then to video rehearsal alone (Van Laarhoven & Van Laarhoven-Myers, 2006); and fading video prompts to audio (Taber-Doughty, Patton & Brennan, 2008). Van Laarhoven et al., (2009) recommended the availability of multiple kinds of prompts such as textual, auditory, picture and video on a single device where learners can select the support they want as they are acquiring a task, and then shift the function of the device to an activity schedule to assist with time management and transitions when the individual tasks have been mastered.

Clustering prompts. Clustering or chunking instructions of tasks after acquisition has also been an effective strategy for maintaining or improving vocational task performance (Furniss et al., 1999; Horn, Miltenberger, Weil; Mowery, Conn, & Sams, 2008; Lancioni et al., 2001; Lancioni et al., 1998; Sigafoos et al., 2007).

Lancioni et al. (2001) advocated the use of clustering steps of vocational tasks together to reduce the duration of task completion, the number of external prompts needed, and to increase autonomy and self-control. In a two-phase study, Lancioni et al.

(2000) used computer-based picture prompting to promote task acquisition by showing a picture prompt of a step; the student completes the step, and then replicates that sequence across all the steps of the task. In the second phase of the study, three formats of changing prompts after tasks acquisition were compared. The first method was clustering of picture prompts where about 2/3 of the prompts were shown in clusters of two picture prompts. The first picture was shown briefly, and then the second picture remained on the screen until the participant prompted the next step. The second method was to eliminate about a third of the picture prompts in an acquired task. The third method was to fade all prompting. Participants maintained accuracy most in the clustering condition followed by the omission condition.

Chunking video prompts together can be used to effectively fade video prompts (Sigafoos et al., 2007). Horn et al., (2008) began with a video model of a complete task and then progressively segmented the video until participants reached a criterion level of performance reducing it from a model to a prompt. Sigafoos et al. (2007) used video prompting to teach washing dishes to participants with intellectual disabilities. After unsuccessful attempts to fade the video prompt, the video prompting clips combined into four chunks, then two chunks, then one final video chunk that showed all ten steps. The prompt then was faded successfully for two participants.

In a new adaptation of the Sigafoos fading procedure, Brady (2010) used video prompting to teach two cleaning tasks to adolescents with mild to moderate intellectual disabilities. An adapted alternating treatment design was utilized to compare the effectiveness of fading video prompts to a chunked video model and fading video prompts to picture prompts. A step in the prompt was faded when the participant

independently completed the step for two consecutive sessions. With video to picture prompting, the video was replaced with a picture of the task whereas in the video model, known steps were chunked sequentially and included the unknown step. For example, if the participant knew steps 1-3 but not step 4, then in video to picture prompting, steps 1-3 became pictures and step 4 remained a video. Chunking videos together would have shown steps 1-4 as one video clip. The results were split with two participants responding better to fading procedures utilizing pictures and two responding better to procedures with video modeling.

Self-adjustment of prompts. A final method of adapting prompts is to evaluate how participants use prompts and how that changes over time. Providing various forms of prompts on one device and allowing participants to choose the level of prompts they want to access has been effective in the past (Mechling et al., 2010; 2011; Wu, 2011). Wu (2011) combined video prompting with activity schedules utilizing impromptu and First Then Visual Schedule on an iPod Touch for four participants with developmental disabilities and hearing impairments. The researcher concluded that visual schedules and video prompting could be used concurrently to teach acquisition and completion of a fixed or novel sequence of tasks. All four participants in Wu's study in the fixed schedule condition increased the percentage of steps completed independently with no prompts, reduced the percentage of steps in which video prompts were used, and two participants utilized picture prompting for a small percentage of steps as a form of self-fading prompts. In another method of allowing self-adjustment of prompts, Mechling et al. (2010) provided picture, video, and audio prompts and allowed participants to choose what level of prompt they wanted. Over time, participants relied less on video prompts

and more on picture or picture plus audio prompts. Mechling et al. (2010) concluded that as participants became more familiar with a task, they needed less intrusive prompts and that procedures should be developed and tested to facilitate this process in a systematic manner. Procedures must also be developed to ensure generalization to new tasks and settings.

Generalization

Vocational settings require adaptation of tasks as the needs of the setting change. Additionally, the materials may change that are used in tasks, or employees may be expected to go to another location within the vocational setting to complete the same tasks or complete similar tasks in the same setting. Generalization is the “occurrence of relevant behavior under different, non-training conditions (i.e., across subjects, settings, people, behaviors, and/or time) without the scheduling of the same events in those conditions” (Stokes & Baer, 1977, p. 350).

The most commonly used generalization strategy in technology mediated self-prompting interventions is to program for and assess generalization across behaviors. Generalization has been programmed for in some previous research utilizing technology mediated self-prompting for daily living tasks, but has not been as evident in empirical research with employment tasks. For example, Trask-Tyler et al. (1994) assessed generalization of cooking skills after use of an auditory prompting system by utilizing component skills of instructed recipes in new recipes.

Another method used to promote generalization is to program across settings. For example, Briggs et al. (1990) used an auditory prompting system to teach operation of a washer or dryer at school and then assessed generalization to a washer or dryer at home.

In another example, Hansen and Morgan (2008) used three different supermarkets in their intervention for purchasing skills.

Generalization across materials was programmed for by Van Laarhoven et al. (2010) using a variety of brands of food, utensils, and appliances within the intervention. Programming for generalization is essential in successful implementation of technology-mediated self-prompting interventions. In addition, generalized use of technology mediated self-prompting devices themselves serve as a behavioral cusp in which an endless number of increasingly complex tasks can be instructed and acquired across settings, tasks, and materials.

Utilizing technology based visual supports represent a powerful technology that can be applied to the ever-changing demands in a integrated employment setting. Employees must be able to complete multiple tasks and independently transition between tasks. Independent completion of tasks must occur quickly to allow for successful employment experiences. Technology that can prompt both task acquisition and transitions between tasks will allow consumers to be more independent of job coaches and coworkers. The research on using technology-based visual supports has limitations though. The training methods used to teach technology use have been described only briefly in the literature and rarely has data been taken on performance during training. In addition, there have been limited data on correct navigation of technology during intervention. Only one study utilized the replacement of video prompts with picture or textual prompts (i.e., Brady, 2010). Reducing prompts to less intrusive levels allows for high rates of accuracy to still be completed. Van Laarhoven et al. (2009) stated that prompting devices could be faded to function more as an activity schedule once tasks

have been acquired. However, no research has demonstrated this procedure to be possible at a rate that will still maintain accuracy in integrated employment settings. Additionally, generalization has also not been assessed in integrated employment settings using video prompting. Therefore, the purpose of this study is to investigate the effects of self-directed video prompting in integrated employment settings. Specific procedural components of this study that make it a contribution to the literature are the application of reduction of prompts in integrated employment settings and generalization to new tasks, settings, or people.

Chapter 3: Methods

This chapter describes the process of conducting this study, including information regarding the participants, the setting in which sessions were conducted, and the procedures of each phase of the study (participant recruitment to generalization).

Participants

The participants in the study were three adult males, ages 20 to 26 years old, with an average age of 22. All participants met the definition criteria for having an intellectual disability (ID), that is, having significant limitations in intellectual functioning, adaptive behaviors, and the onset of the disability occurring prior to the age of 18 (McDermott, Durkin, Schupf, & Stein, 2007). Participants were working in unpaid job internships or paid jobs in an integrated employment setting at The Ohio State University or a local area business as part of a postsecondary program. One participant had a diagnosis of autism, the second participant had multiple disabilities with significant fine motor and communication deficits in expressive language, and the third participant had Down's Syndrome and a co-existing visual impairment. As part of the study, each participant was taught at least three new vocational tasks in their integrated employment setting. Participants were recruited from the first and second cohort of students from the Transition Options in Postsecondary Settings for Students with Intellectual Disabilities (TOPS) program at the Ohio State University. The criteria for participants to be included in the study were: (a) having at least three new tasks to learn in the integrated

employment setting, (b) being capable of visually viewing items on an iPad, and (c) demonstrating the ability to repeat an action modeled on a video clip.

Participants who met the above criteria were invited to participate in this study and consent to participate was obtained from each participant (see Appendix A). Program staff at Nisonger confirmed that each participant was their own guardian, thus, written parent permission was not necessary. Written video consent was also obtained from video models and participants (see Appendix B). Job coaches assisted the primary researcher in obtaining verbal permission from each employer to film tasks, and permission to allow the participant to use an iPad to facilitate learning new tasks. Table 1 shows demographic and assessment information for each participant characteristics.

Table 1

Participant Characteristics

Name	Age	Race	Disability	IQ	Adaptive Behavior Assessment Scale
Perry	22	Caucasian	Autism	74 ¹	93
Cam	26	Caucasian	Multiple disabilities	Not available	58
Mac	20	Caucasian	Intellectual Disability	76 ²	72

¹Differential Abilities Scale

²Wechsler Abbreviated Scale of Intelligence

Participant 1: Perry

Perry was a Caucasian male diagnosed with autism. He was in his first year in the TOPS program at Ohio State. He had experience volunteering in an animal shelter prior to enrolling in the TOPS program. Perry's long-term employment goal was to care for exotic animals. His initial internship training site was a nearby pet store. Perry's job duties consisted of cleaning shelves and organizing displays. Perry did not have experience using iPads, performing the assigned tasks or job duties, or using video prompting for support.

Participant 2: Cam

Cam was a Caucasian male student diagnosed with multiple disabilities, with significant limitations in intellectual functioning, gross and fine motor skills, and deficits in communication. Cam had a long-term employment goal of working with people in his community. Cam was in his second year of the TOPS program and had multiple work experiences at OSU and in the local community. Most recently, he worked at the library (shelving books and journals, sorting and delivering mail), the hospital cafeteria (making salads), and the Nisonger dental clinic (assembling trays). Although Cam had previous experience using an iPad, he did not have experience using video prompting for support. Cam had previously been exposed to the tasks on the job site and had used an iPod for self-monitoring transitions between tasks with a checklist at the library.

Participant 3: Mac

Mac was a Caucasian male student with Down's syndrome and a co-existing visual impairment. Mac was in his first year of the TOPS program. His long-term employment goal was to obtain employment in a field related to politics (advocacy). At

the beginning of the study, Mac was participating in two internships at OSU. He worked at the athletic facility and the Nisonger dental clinic. Mac's job responsibilities at the athletic facility included cleaning and setting up for special events. His job duties for the dental clinic included cleaning and assembling dental trays for the dental hygienist, basic cleaning, and filing. Initially, the athletic facility was selected to implement the self-directed video prompting intervention, but the job routines varied daily and assigned tasks were unpredictable, therefore, the dental clinic was selected to conduct the intervention. Unfortunately, his internship ended at the dental clinic prematurely because of frequent attendance violations. However, the intervention for the third task cleaning the breakroom, was able to continue, because the breakroom is accessible without going into the dental clinic.

Setting, Tasks, and Materials

The study was conducted in three integrated employment settings at The Ohio State University and in the local community. Specifically, the intervention for Perry occurred at a local pet store, the intervention for Cam occurred at a recreational facility at Ohio State, and the intervention for Mac occurred in the Nisonger Center's dental clinic and breakroom. The tasks targeted for intervention varied across the participants and employment settings (see Table 2). To be selected as a potential targeted task for the study, the task must meet the following criteria: (a) consistent or semiconsistent occurrence at the employment site, (b) similar procedure every time the task is completed (c) similar number of steps, (d) similar fine and gross motor requirements, (e) dissimilar enough in content to not be generalized from learning an earlier task (e.g., the tasks had to consist of the same procedures every time they were completed. Observation and Data

collection times ranged from 15 minutes to 3 hours, because intermittent completion of tasks not targeted for the intervention were also completed during data collection times.

Table 2

Setting and Tasks

Student	Setting	Tasks (Number of Steps)	Maximum time allowed per step
Perry	Pet store	Clean/straighten shelves of boxes and bags (15)	42
		Clean/straighten bottles of fish food (15)	36
		Clean /straighten shelves of large items (17)	54
Cam	Recreation Center	Check out Equipment (11)	26
		Clean Treadmill (16)	34
		Clean Stairstepper (24)	29
Mac	Nisonger Dental Clinic	Code sheet (10)	26
		Assemble dental tray for cleaning (15)	31
		Clean breakroom (12)	33

Pet store

Perry's job duties included performing three tasks at the pet store. The pet store was 3,795 sq m in size and sold supplies for household pets, as well as, sold or put up for

adoption, fish, reptiles, rodents, and cats. The pet store had approximately 30 rows of shelves in the center of the store with additional shelves along the perimeter. There was also a storeroom, breakroom, and restrooms in the back. During baseline and intervention, a job coach, the experimenter, one or two store managers, two to three employees, and one other TOPS student working in an internship were present at the pet store. The number of customers present varied daily, but never exceeded more than 15 in the store at any time. The supplies used in the pet store included a spray solution for dusting, dishrags that the participant obtained from the rag area in the storeroom, and a shopping cart.

Recreation center

Cam completed three tasks at the recreation center. Two of the tasks (i.e., cleaning the treadmill and stairstepper) were done on exercise equipment located in a 1,319 sq m cardiovascular fitness area (see Figure 1). The fitness area is part of a larger recreation facility (7,702 sq m) containing weights and cardiovascular equipment. The cardiovascular area consists of 12 EFX machines, three stairsteppers, two different types of treadmills for a total of 30 treadmills, two different types of exercise bikes for a total of 14 exercise bikes, one ergonomical hand bike, and three arc trainers.

One of the tasks (i.e., equipment checkout) was done at the equipment checkout desk (see Figure 2) that was situated between the weight and cardiovascular equipment areas. The equipment checkout desk area consisted of a computer with an ID scanner to scan patron ID's, and a set of drawers to store equipment that could be accessed from the equipment desk checkout station. Behind the equipment checkout desk was a suite of offices where employees and student workers kept personal belongings. Located next to

the checkout station were cleaning supplies in a two-drawer file cabinet. Cleaning supplies were also kept on the desk. A bin for dirty towels was located next to the file cabinet. A shelf of additional equipment was located behind the equipment desk. At the checkout desk, there were up to two other student workers, a job coach, the experimenter, and occasional customers checking out equipment were present. The check out desk was often busy because other employees and managers frequently walked through to the office suite located behind the checkout desk. In the cardiovascular area, a job coach, the experimenter, sometimes a student worker, and up to 30 customers working out on equipment were present.

Figure 1. Cardiovascular equipment area.

Figure 2. Desk checkout area

Dental Clinic

Mac completed three tasks at the Nisonger Center. Two of the tasks (i.e., coding the sheet and setting up cleaning trays) were done in the back room at the dental clinic (see Figure 3). The dental clinic serves individuals with intellectual and developmental disabilities in Franklin County and surrounding areas. In the back room where the tasks were completed, there was a job coach and the researcher present. Additionally, two staff from the dental clinic frequently entered and left the back room. In the main dental clinic area, there was typically a dentist present, a couple of dental students, and up to two dental hygienist students. Additionally there were two to three staff members present. Finally, up to three patients were being seen in the dental clinic area during the intervention.

Figure 3. Dental clinic back room

The third task was completed in the break room on the first floor of Nisonger. During baseline and intervention, the experimenter and up to four employees or TOPS students were present in the break room during baseline and intervention. The break room consisted of four tables with four chairs, one counter with eight bar stools along the perimeter of one wall, an L-shaped counter with storage cupboards above and below the counter, two refrigerators, a sink, and two microwave ovens.

Research Personnel

Experimenter

The primary experimenter was a doctoral student with 10 years teaching experience. In addition, she had worked for three years with young adults with intellectual and developmental disabilities as part of the TOPS program. The

experimenter was familiar with iPads and had implemented self-directed video prompting using iPads in a previous study..

Observers

Graduate students who were participants in the Leadership Education for Neurodevelopmental Disabilities (LEND) program at the Nisonger Center, job coaches who worked at the Nisonger Center, and graduate students from the College of Education and Human College at The Ohio State University served as the data collectors for procedural integrity and interobserver agreement. Three job coaches served as data collectors. All three job coaches had worked at Nisonger Center for less than one year with one of these job coaches also having 20 years of previous experience in job coaching. They had varying degrees of education that included a high school diploma, a bachelor's degree in special education, and a master's degree in social work. The final data collector was a student worker at Nisonger Center who was pursuing a master's degree in Family and Consumer Sciences.

Materials

Technology Used

An iPad 2 or iPad 4 with MyPicsTalk, an app that allows for easy recording, combining, and adapting the video prompts, were used throughout the study for participants to use in self-prompting employment tasks. Video prompts of job tasks representing one step of a task were recorded using the iPad camera. The movies were then edited in the MyPicsTalk app and iMovie. Two combinations of videos were recorded, with the primary method being from the viewpoint of a spectator (i.e., showing a model performing the task) and the other, from the viewpoint of the participant (i.e.,

showing the salient features of the task such as words, numbers, and buttons) or tools used to complete the task (Legrice & Blampied, 1994). When participant view was used, it was closeups used for a specific part of a step, and then a return to participant view. A one-sentence voice over instruction was embedded within the video-prompting clip (e.g., Sigafoos et al., 2007). iMovie on the iPad was used to edit videos as needed.

Additional details, such as captions or titles, were created and edited within the MyPicsTalk app. Headphones or speakers were available for use as needed. In addition, cases that allowed for the iPad to be set upright while the participants watched the video prompts were also available. However, the only participant who needed it to be set upright was Perry. The iPad was selected for this study because it is portable, has a larger screen for viewing, and the MyPicsTalk app was only available for the iPad. To use the iPad with MyPicsTalk, the user must first select the app from the iPad. (see Figure 5 for screenshot). Then, the user must select the correct task from the list of available tasks (see Figure 6 for screenshot). Next, the user must select the first step of the task by tapping it. Then, the user must click play to start playing the step. Finally, the user can swipe with one to two fingers to move to the next step of the task or tap the arrow with one finger to move to the next step.

Figure 4. Screenshot of iPad home screen.

Figure 5. Screenshot of available tasks on MyPicsTalk.

Figure 6. Screenshot of individual steps of treadmill task.

Figure 7. Screenshot of individual step of treadmill task.

Task analyses were developed for each task targeted for intervention (see Appendix C for a copy of task analyses). For existing internships, the task analyses came developed by previous job coaches and occupational therapists were revised if necessary. For new internship sites or new tasks within existing internship sites, task analyses were developed in conjunction with job coaches and supervisors.

Dependent Variables

Accuracy of Task Completion

Accuracy of task completion was measured by percentage of steps completed correctly without experimenter prompting. The participant had to begin the task within 5 s of the presentation of the video or picture prompt for the step to be counted correct. In addition, the step had to be completed within the allotted maximum time for steps of the task (see Table 2). The maximum time allotted for a step was determined by taking the longest duration of a step in the task and adding 10 s (e.g., wiping the top rail of the treadmill takes 24 s so 34 s would be the longest duration allowed for a step of the treadmill task before a step would be counted incorrect). The number of steps varied by task, but were identified prior to intervention through task analyses developed by the job site, job coaches, or the experimenter. The percentage of steps completed accurately was calculated by dividing the number of steps completed accurately by the total number of steps in the task and multiplying by 100. The tasks selected for intervention included tasks that were done on a consistent or semiconsistent basis by the participant within the context of their internship/employment duties. The tasks had to consist of similar procedures everytime they were done. For example, assembling an orange dental tray

followed the same procedures whereas filing patient files varied each day and were based on scheduled appointments.

Accuracy of iPad Use

Accuracy of iPad navigation and usage was measured by the percentage of correct navigation and usage steps completed correctly without experimenter prompting. To calculate the percentage of navigation and usage steps completed correctly, the number of steps completed correctly was divided by the number of total steps and multiplied by 100. The participant had to initiate the next navigation or usage step within 5 s of the completion of the previous step of the task, navigation, or usage for navigation to be counted correct.

Design

A multiple probe across tasks design (Horner & Baer, 1978) was used to determine the effects of technology mediated self-prompting on the acquisition of vocational tasks in integrated employment settings by participants with mild to moderate IDD. The design was replicated across three participants. Three tasks were selected to be performed by each participant in the same setting (i.e., his/her integrated employment setting). These tasks were systematically subjected to the same intervention (i.e., self-directed video prompting on the iPad). A multiple baseline design across participants was used to evaluate the training for teaching device usage.

A multiple probe across tasks design is appropriate when a continuous baseline may be reactive, impractical, or unlikely to change without intervention (Cooper, Heron, & Heward, 2007). The multiple probe across tasks design is also appropriate when access

to participants may be limited to certain times, or it may not be practical to repeatedly measure the same participant's behavior. In particular to integrated employment settings, it is inappropriate for the participant to do tasks incorrectly when the employer is dependent on the task being completed correctly. Additionally, practicing errors may be detrimental to the participant's progress. A multiple probe across participants design was used to evaluate the effectiveness of the training on acquisition of iPad navigation and usage.

Procedures

Baseline

During baseline, participants received regular job coaching support and used checklists that were used by all employees. Baseline sessions were conducted at a time agreed upon by the job coach and experimenter that allowed data collection for a minimum of one task. Baseline sessions began with the experimenter giving the participant a verbal task direction (e.g., clean the treadmill).

A multiple opportunity method was used during baseline (Cooper et al., 2007), which provided more information than single opportunity method because they provide data for each step. In single opportunity probes, the session is terminated the first time a participant makes an error or does not initiate the step. In each multiple opportunity baseline probe, the participant was given 5 s to initiate a task step. If the participant did not begin the task step, the experimenter either turned the student away from the task and completed the step, or the experimenter or job coach prompted the student verbally or through modeling to complete the step. A timer on an iPhone or iPad was used to measure the time. The procedure used in most baseline sessions was to prompt the

student verbally or through modeling to complete the task. This adaptation was used after it became apparent in Perry's and Cam's work sites that a limited number of tasks were identified for intervention, and the identified tasks comprised a significant portion of their work responsibilities. Although not traditionally a part of multiple opportunity probes, this adaptation of prompting the student to complete the task was necessary for the integrated employment setting, because the tasks were part of the participant's work responsibilities. Additionally, the experimenter wanted to maximize opportunities for future employment at the site. The student was then verbally prompted to keep going. The participant was given 5 s to initiate the second step of the task. If the participant did not initiate the task step within 5 s, the experimenter again turned the student around and performed the step or prompted the participant verbally or through modeling to complete the step. The step was also counted as an error if the participant took longer than the allotted maximum time for steps of that task. This process continued for all steps required to complete the task. Directions between the steps were simply "Keep going." At the end of the session, the participants were praised for working with the experimenter.

Pre-Intervention Training

Pre-intervention training involved individual training to use the app by modeling how to use the device and app. The practice of using the iPad and MyPicsTalk app continued until the participant demonstrated the seven key aspects of usage and navigation for this intervention: turn on the iPad, select the app, select the specified task, play a clip, advance sequentially through the clips until the task was completed, exit the app, and turn off the iPad. Using a system of least-to-most prompting paired with completion of a training task, the primary researcher was able to implement the training

procedure after baseline data stabilized for each task (e.g., Mechling et al., 2009; Van Laarhoven, Kraus, Karpman, Nizzi, & Valentino, 2010). Data on correct navigation and task accuracy were collected to ensure that participants were able to correctly navigate the iPad and complete the training task with 90% accuracy across two trials. The training utilized a task analysis and iPad usage and navigation checklist to train and measure participant mastery of the required skills. The checklists were generated specifically for this study and consisted of a series of steps assembling school supplies on a desk in a specified order. This task was generated for the study because participants were unlikely to have a history of completing this exact task, so learning how to use the iPad to complete the task was likely to not be impacted by previous knowledge of the task. In addition, participants were familiar with the names of materials, because they had used them throughout school so they would not have to acquire new vocabulary to complete the task. The participant was directed to complete the task of assembling school supplies using the iPad to learn how to complete the task. A system of least-to-most prompting was used for error correction of usage and navigation. An error in navigation was defined as failing to complete any of seven steps. Error correction of task completion consisted of having students rewatch the video, then using a system of least-to-most prompts to correct errors. An error in task completion was identified as failing to initiate the step of a task within 5 s of watching the video prompt, failing to complete the step within the maximum time allotted for step completion, failing to complete a step correctly according to the task analysis, or completing a step out of sequence. Error correction procedures for completion of incorrect task steps included: (a) having the participant first re-watch the video, then using least-to-most prompts (Cannella-Malone, Wheaton, Wu, Tullis, & Park,

2012), increasing in degrees of assistance with each incorrect attempt to complete the step. Starting from the least intrusive prompt, prompts included verbal, gesture, partial physical, and full physical prompts. The use of prompts was a step-by-step decision that was restarted each step of a task, for each session. In other words, the first prompt given for a step was always verbal. If the verbal prompt did not evoke an accurate response from the participant, the experimenter used a gesture prompt. If the gestural prompt did not get the accurate response, then partial physical, and finally full physical prompts were used. A preset criterion of 90% for two consecutive trials had to be reached for mastery in order to move into intervention when using the training task procedures.

A final phase of pre-intervention training involved selecting the first task targeted for intervention from the task selection screen of MyPicsTalk. The participant had to correctly select the task for three trials in order to proceed to intervention on the first task.

Intervention

Baseline data were collected on all three tasks, and the one with the most stable baseline entered intervention first. The participant was instructed to complete the task. The procedures for intervention mirrored that of the training task, except the task targeted were one of the vocational tasks selected for intervention.

Error correction procedures used in the training task for both navigation and accuracy were implemented the same during intervention. When the participant reached 80% accuracy across three consecutive sessions on the first task and had stable baseline levels for the second task, the second task was put into intervention. Similarly, when the participant reached 80% accuracy on the second task across three consecutive sessions and had stable baseline levels for the third task, the third task entered intervention.

Generalization

Generalization was assessed through stimulus generalization to picture prompts from the self-directed video prompts for one participant (Mac). The self-directed video prompts for the task were not available in the app for that session. No error correction procedures were used during generalization sessions. Generalization was also demonstrated through response maintenance (Cooper et al., 2007). Response maintenance was utilized with one participant (Cam).

Generalization was also assessed by either having students complete a similar task in the same setting, the same task in a different setting, or the same task with different materials or people (see Table 3 for generalization tasks). For example, Cam cleaned a different kind of treadmill. Mac completed generalization tasks with a similar kind of dental tray. Perry completed the same tasks in a different area of the pet store with slightly different materials. For example, the video prompting tasks for boxes and bags for Perry focused on the boxes and bags of dog treats. Generalization probes consisted of shelves that included boxes and bags such as rodent bedding and vitamins.

Additionally, for Cam, generalization procedures differed for Task 1. In the first intervention session, video prompting was used with an authentic customer. However, this created a time delay in getting the customer their equipment associated with video prompting; therefore, pseudo-customers were used for the rest of intervention. Authentic customers were used for generalization after intervention was concluded.

Table 3.

Generalization Tasks.

Student	Original Task	Generalization	Type of generalization
Perry	1. Clean/straighten shelves of boxes and bags of dog treats	1. Clean/straighten shelves of boxes and bags of rodent bedding and food	1. New materials
	2. Clean/straighten bottles of fish food	2. Clean/straighten bottles of 2 nd fish food area	2. New materials
	3. Clean /straighten shelves of large items of food storage	3. No generalization assessed	3. N/A
Cam	1. Check out equipment with Pseudo customer	1. Check out equipment with real customer	1. Response maintenance & Across people
	2. Clean Treadmill	2. Clean different type of treadmill	2. New materials
	3. Clean Stairstepper	3. No generalization assessed	3. N/A
Mac	1. Code sheet	1. No generalization assessed	1. N/A
	2. Assemble orange dental tray for cleaning	2. Assemble red dental tray	2. New materials
	3. Clean breakroom counter	3. Clean counter in classroom	3. New setting

Interobserver Agreement and Procedural Integrity

Observer Training

Data collectors were trained on the use of the forms for procedural integrity (see Appendix D for an example of the form used) and interobserver agreement (IOA) (see Appendix E for example of form used) using videos of mock run-throughs of cleaning tasks or in vivo vocational tasks not targeted for intervention. The same task analysis forms used for navigation and accurate task completion were introduced in one-on-one sessions. Following a form training, a trial run through with modeling of how to use the forms was conducted. Then the observer independently collected data on two trials. If agreement was at least 90%, then the observer was identified as trained. All observers achieved 90% or higher agreement in the two independent data collection trials. Finally, the observers were trained on the procedural integrity forms. Procedural integrity and IOA were assessed through a second observer being present and/or video recordings of sessions.

Interobserver Agreement

IOA was calculated across at least 25% of sessions for each participant. For Perry, IOA was calculated for 10 of 37 (27%) sessions. For Cam, IOA was calculated for 15 out of 54 (27%) sessions. For Mac, IOA was calculated for six of 18 (33%) sessions. IOA was calculated across all phases of the study for all participants, and IOA was measured using trial-by-trial IOA for accuracy of task completion and accuracy of iPad use. The number of agreements was divided by the total number of trials and then multiplied by 100 to give a percentage of agreement.

Procedural Integrity

Procedural integrity was assessed for at least 25% of sessions using a procedural integrity checklist completed by a second observer. For Perry, procedural integrity was calculated for 10 of 37 sessions. For Cam, procedural integrity was calculated for 15 out of 54 sessions. For Mac, procedural integrity was calculated for six of 16 sessions. The number of steps completed correctly by the researcher was divided by the total number of steps to obtain the percentage of steps the experimenter completed correctly.

Social Validity

Social validity data were collected from both participants and staff that work with the participants. Participant interviews were conducted through a structured interview form (see Appendix F). Social validity data were collected from the staff using an anonymous survey administered through Survey Monkey (see Appendix G for screenshot of the entire staff survey). Five of the questions were adapted from social validity questions used in a previous video prompting study (i. e., Hammond, Whaley, Ayres, & Gast, 2010). All six of the staff members surveyed, responded to whom the survey was sent, responded. The data were downloaded from Survey Monkey. Staff members who responded included job coaches (2), program managers (2) of the TOPS program, and job developers (2). Questions were asked about the goals, procedures, and effects of the intervention.

Chapter 4: Results

This chapter describes the results of the study, investigating the effects of self-directed video prompting on the acquisition and completion of tasks in integrated employment settings. First, interobserver agreement and procedural integrity data are presented. Second, data including: (a) accuracy of task completion for each of the targeted employment tasks, (b) accuracy of task completion on generalization tasks, and (c) accuracy of iPad use, and (d) correct navigation, are described. Finally, a summary of the results of the social validity of the intervention on the participants and program staff, including job coaches and program managers, are described.

Interobserver Agreement and Procedural Integrity

Interobserver Agreement

Interobserver agreement (IOA) was measured across at least 25% of sessions for each participant with at least 25% of baseline, intervention, and generalization sessions assessed. IOA was calculated across baseline, intervention, and generalization. Overall across the 31 sessions (see Table 4 for more detailed IOA data) assessed for IOA, the mean IOA was 98% (range 90%–100%).

For Perry, IOA was calculated for 10 sessions, resulting in an IOA mean score of 98% (range 96%–100%). For Cam, IOA was calculated for 15 sessions, resulting in an IOA mean score of 96% (range 80%–100%). For Mac, IOA was calculated for 6 sessions, resulting in an IOA mean IOA of 99% (range 98–100%).

Table 4

Mean IOA by Participant and Phase

Name	Total Number of sessions calculated	Baseline	Intervention	Generalization/ Maintenance	Average
Perry	10	96%	98%	100%	98%
Cam	15	100%	95%	100%	96%
Mac	6	100%	98%	100%	99%

Procedural Integrity

Procedural integrity was calculated by dividing the number of steps completed correctly by the experimenter by the number of possible steps implemented in the assessment and multiplying by 100. The overall procedural integrity for the study was 98%. For Perry, Cam, and Mac, the average procedural integrity was 93%, 96%, and 100%, respectively (range: 84–100%).

Results for Training Task and Navigation**Training Task**

Overall, participants were able to acquire the skills to correctly navigate and use the iPad and MyPicsTalk to preset criterion levels (i.e., 90% across two trials), within two to five trials (see Figure 8). For example, Perry acquired the training task and correct navigation in two trials. On the first task, he was able to select the task targeted for

intervention with 100% accuracy, prior to intervention. Cam acquired the training task and correct navigation in five trials. He reached the criterion level on task accuracy in three trials and navigation accuracy in five trials. Cam showed an increasing trend with navigation in the first three trials, and stabilized at 100% in trials 4 and 5. On the first task, Cam was able to select the task targeted for intervention with 100% accuracy prior to intervention. Mac acquired the training task and correct navigation in three trials. On the first task, Mac was also able to select the task targeted for intervention with 100% accuracy prior to intervention. A functional relation between the training and improved accuracy in training task completion and navigation accuracy was demonstrated through improvement only when the training on device usage was implemented.

Figure 8. Navigation and Accuracy for Training Task

Navigation

Navigation of the iPad and MyPicsTalk app was measured throughout the study. The means for each task for each participant are presented in Table 5. Perry had 80% accuracy in task 1 for navigation, but improved to 100% accuracy for tasks 2 and 3. Cam showed steady improvement in navigation accuracy with each task. He went from 85% accuracy in Task 1 to 91% in Task 2 and 97% in Task 3. Mac showed consistently high accuracy in all three tasks, with his lowest accuracy in Task 2 with 98% accuracy.

Table 5

Navigation Accuracy

Participant	Task 1	Task 2	Task 3
Perry	80%	100%	100%
Cam	85%	91%	97%
Mac	100%	98%	100%

Accuracy of Task Completion

Participant 1: Perry

Perry demonstrated improved accuracy in task completion of vocational tasks at the pet store when the video prompting was implemented across all three tasks targeted for intervention (see Figure 9). Additionally, generalization to new materials in the store that were not part of the video prompts was demonstrated for the two tasks for which it was measured (i.e., shelves of boxes/bags and bottles of fish food). His accuracy for Task

1 (clean/straighten shelves of boxes and bags) in baseline was stable between 13% and 26% correct. When intervention began, his accuracy increased to 70% correct and steadily improved to 100%. Generalization to new shelves of boxes and bags was demonstrated with performance between 73% and 86% correct. For Task 2, Perry had stable baselines between 6% and 12% correct on cleaning and shelving fish food. When intervention began, his accuracy improved to 80% and steadily increased across the five intervention sessions to 94% correct. Generalization to a new section of fish food was measured at the end of intervention. Perry demonstrated generalization to new materials with accuracy of 80% to 94% correct across four generalization trials. In Task 3, Perry had baseline performance levels of 14% to 28% correct with a decreasing trend evident before intervention was begun. After intervention began, his accuracy improved to 76% correct. His final two sessions of intervention, before the study was terminated because Perry obtained paid employment, were 71% and 76% correct. Generalization was not measured for this task.

Figure 9. Perry's vocational task performance.

Participant 2: Cam

Cam demonstrated improved accuracy in task completion of vocational tasks at the recreational center when the video prompting was implemented across all three tasks targeted for intervention (see Figure 10, below). Additionally, generalization to new people or materials was demonstrated in the two tasks for which it was measured (i.e., check out equipment and clean treadmill). His accuracy for Task 1 (check out equipment) in baseline was stable at 9% correct. When intervention began, his accuracy increased to 91% correct. Cam's performance was variable in intervention for checking out equipment with scores between 64% and 100% correct ($M = 86.5\%$). During generalization with authentic customers, Cam's performance was between 82 and 91% ($M = 89.2\%$)

For Task 2, Cam had a stable baseline between 7% and 20% correct on cleaning treadmills. When intervention began, his accuracy improved to 67% correct. Although his intervention data shows variability, there is an increasing trend throughout intervention. Generalization through response maintenance (i.e., no video prompting) was demonstrated with accuracy between 88% and 94% correct. On a generalization trial to a new treadmill, Cam had an accuracy of 75% correct. In Task 3, Cam had baseline performance levels of 0% to 17% correct. After intervention began, his accuracy improved to 39% in the first trial and steadily increased to 76% correct when the study ended, because Cam's internship ended. No generalization trials were completed for Task 3.

Figure 10. Cam's vocational task performance

Participant 3: Mac

Mac demonstrated improved accuracy in task completion of vocational tasks at the dental clinic and breakroom at Nisonger Center when video prompting was implemented across all three tasks targeted for intervention (see Figure 11). Additionally, generalization to new materials in the dental clinic (red tray) and new settings (classroom) that were not part of the intervention was demonstrated for the two tasks for which it was measured (i.e., assemble dental tray and clean break room counter). His accuracy for Task 1 (complete coding sheet) in baseline was stable at 0% correct. When intervention began, his accuracy increased to 50% correct in trial 4 and 70% correct in trial 5. No further data were collected on Task 1, because he did not perform it after trial 5. For task 2 (assemble orange dental tray), Mac had baseline scores of 0% accuracy. Once intervention began, his accuracy improved to 50% and steadily improved to 100%. Generalization to assembling a new tray (red) was demonstrated with performance between 87% and 100% correct. For Task 3, Mac had baseline scores between 44% and 60% correct on cleaning the counter in the break room with a decreasing trend evident before intervention began. When video prompting was introduced, his accuracy steadily increased across four trials from 52% to 92% correct. Generalization to cleaning a counter in a classroom at Nisonger was measured across two trials and had scores of 76% and 84% correct.

Figure 11. Mac's vocational task performance.

Summary of Overall Results for the Study

Trials to criterion

Overall, video prompting was effective at increasing the accuracy of vocational task completion across all three participants. Participants acquired the tasks in 3–13 sessions for tasks that were not prematurely discontinued, because of limited opportunity to engage in the task (i.e., Task 1 for Mac) or the end of internships (i.e., Task 3 for Perry and Cam) (see Table 6 for individual participant data).

Table 6

Number of trials to criterion

Participant	Task 1	Task 2	Task 3
Perry	4	3	X ¹ /(3) ²
Cam	3	13	X/(5)
Mac	X/(2)	3	4

¹Not achieved

²Number of sessions with data prior to intervention withdrawal

Overall Task Accuracy

Baseline levels were low with stable scores or with decreasing trends prior to intervention. Once intervention began, there was an immediate performance change with accuracy increasing throughout intervention for all three participants. Specifically, Perry was able to complete the tasks of straightening and cleaning shelves of boxes and bags, fish food, and large items with a mean percentage correct in intervention of 85% (range:

71–100%), which was a 438% increase over the baseline mean of 16% (range: 6%–28%).

Cam was able to complete the tasks of checking out fitness equipment, cleaning a treadmill, and cleaning a stairstepper with a mean percentage correct of 80% (range: 39%–100%), which was a 515% increase over the baseline mean of 13% (range: 0%–20%). Mac was able to complete the tasks of coding the tray preparation sheet, assembling an orange dental tray for cleanings, and cleaning the counter in the break room with a mean percentage correct of 76% (range: 50%–100%). This improvement was a 347% increase over the baseline percentage correct ($M = 17\%$; range: 0%–60%).

Additionally, each participant demonstrated generalization to new materials, settings, people, or response maintenance in two of their tasks. For each participant, there was one task where generalization was not measured. The table below shows overall mean scores for each participant by phase. Overall, mean scores increased between baseline and intervention. Generalization data also showed an increase over baseline.

Table 7

Mean Percentage of steps completed correctly across phases

Participant	Baseline ¹	Intervention	Generalization ²
Perry	16%	85%	85%
Cam	13%	80%	89%
Mac	17%	76%	89%
Overall	15%	80%	87%

¹Intervention task only (does not include generalization baseline data)

²During or after intervention for 2 tasks per participant

Percentage of Nonoverlapping Data

Percentage of nonoverlapping data (PND) was calculated by tasks, by participants, and for the overall study. PND was calculated by taking the highest baseline point and then counting all intervention data points that exceed that point, and then dividing by the total number of intervention points (Scruggs & Mastropieri, 1998). To get the overall study PND, the number of intervention data points that overlapped with baseline (1) was divided by the total number of intervention data points (55). The mean PND for Perry and Cam for all three tasks was 100% for both intervention and generalization. The mean PND for Mac was 90% for intervention and 100% for generalization. Overall, the study PND was 98% for intervention and 100% for generalization.

Table 8

Mean PND scores overall and by participant.

Participant	Task 1		Task 2		Task 3		Overall	
	Int ¹	Gen ²	Int	Gen	Int	Gen	Int	Gen
Perry	100%	100%	100%	100%	100%	X ³	100%	100%
Cam	100%	100%	100%	100%	100%	X	100%	100%
Mac	100%	X	100%	100%	75%	100%	90%	100%
overall	100%	100%	100%	100%	92%	100%	98%	100%

¹ Intervention

² Generalization; 2 tasks per participant

³ Not assessed

Social Validity

Participants

Social validity with participants was assessed through a structured interview about the goals, procedures, and effects of the intervention.

Table 9

Individual responses to participant social validity

Question	Perry	Cam	Mac
What did you like about using the iPad for learning new tasks?	It was easy to watch	It was fun. I like watching people do the job.	I did not have to ask for help with new tasks
What did you not like about using the iPad for learning new tasks?	The videos were too long when it was something I already know how to do	No response	Some videos were too long
How did watching the videos on the iPad help you?	It helped me learn a new job.	It helped me learn to clean	I had never worked at a dental clinic before so it helped me make trays. I think I could have learned it from my job coach just as well though.
Would you use the iPad to learn new tasks in the future? Why?	Yes. I would not have to ask for help from someone else	Yes. No response.	Yes. I could learn how to do anything if it was on there.
What would you change about using the iPad if you used it in the future?	I want to be able to watch the videos while I do the task instead of having to watch the video	I want the videos on my own iPad instead of yours (the experimenter's)	I would have videos on a smaller device like an iPad mini or iPod. It was okay at the dental clinic but it's too hard to carry the big iPad around in my job (janitorial).

Staff

Procedural integrity with staff was assessed through an anonymous survey on Survey Monkey that included questions rated on a scale and open-ended questions. In the survey questions, staff rated whether they strongly agreed, agreed, were neutral, disagreed, or strongly disagreed with a statement about the goals, procedures, and effects of the intervention. All six staff the survey was sent to responded to the survey. The responses to each question are outlined in Table 10. In addition, open-ended questions were asked of staff. A chart of staff responses for the open-ended questions is included in Table 11.

Table 10

Social Validity Summary Chart for Staff

Question	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	N/A or no opportunity to observe
1. The vocational tasks the participant learned were important to their job	4	2				
2. Questions regarding the research that I asked were answered in a prompt manner and to my satisfaction	2	4				
3. The outcome to increase participants' ability to complete vocational tasks was significant to the participant.	3	2	1			
4. The participant became more independent as a result of instruction.	2	2	2			
5. I believe the participant is able to learn from video prompting.	6					
6. The participant was able to use the iPad mostly independently (during the study)	0	3	1			2
7. The iPad is socially appropriate to use for this population and age	4	1	1			
8. The app used was appropriate to show video prompts for vocational tasks	4	2				
9. Video prompting is appropriate for employment internships and employment if supervisors approve	3	2	1			
10. I would be comfortable with helping a participant use the iPad with videos that are already created on it	2	3		1		
11. I would be comfortable learning to add new videos to the iPad	2	2		1		1

Table 11

Chart of Staff Responses to Open Ended Questions

Staff	What do you think the positives of video prompting are?	What do you think are the challenges or negatives of using video prompting in employment settings?	What type of consumer do you think video prompting is appropriate for?	As a job coach/ developer/ program manager do you have suggestions for improving the video prompting for employment settings in the future
1	The prompt is always consistent and does not change. For example, a person can change the way the give a prompt, or the way the say a prompt. However, a video will never change and so consistency is a positive.	The individual I worked with after the study where I implemented video prompting required a high level of gestural or verbal prompts to use the iPad. This was frustrating for me because I felt the participant was receiving a double prompt: 1. from me for prompting him to use the iPad and 2. from the iPad on how to perform the task.	I think video prompting would be beneficial for someone who may easily forget the steps to complete a task, or who may forget how to complete a task. This is only useful if the task is repetitive and does not change. If the task has too much variation, the video may not serve as a good prompt.	I would suggest using a smaller device. Having the participant carry an iPad was rather cumbersome. Additionally, I would have the participant wear ear buds or head phones to listen to the instructions. Having the audio playing in a office-like setting can be a distraction for others in the building. Additionally, this can sometimes be an intrusive prompt and causes the participant to "stand out" when compared to same-age typical peers.
2	More concrete/ comprehensive yet not intrusive to the user	Not appropriate for every setting. Continued use would hinder improvement in efficiency	People who learn best with multimodal instruction	Perhaps deliver on a smaller device like the iPad mini or even iPod touch
3	Utilizes technology to allow a participant to act independently and not rely on another person to perform a task. In addition, the rehabilitation process also becomes less costly as you remove the human labor cost of a job coach to prompt for task accomplishment.	I do not think that video prompting can be accomplished in all job settings. For instance, jobs which require many physical movements and are active might not work because the equipment gets in the way and might be difficult for the user to navigate. The other challenge is getting participants to use the video prompts and training staff on how to integrate the technology.	Visual learners who have fine motor skills and those who can self determine that they are at an impasse and need a prompt to help them. Others who are auditory learners may be able to use a similar audio only recording to be prompted.	Maintaining a library of the prompts would be beneficial as we repeatedly place participants in the same locations.
4	I think the positives of using video prompting in comparison to job coaching is the potential to reduce prompt dependency, increase efficiency in staff resources and the ability of the individual to become self reliant.	Some of the challenges that must be considered is the variations of some job duties and the environmental factors. I believe the video prompts must capture the continuum of duties, as well as the environmental factors including degree, time and situation.	It is appropriate for consumers that can learn to operate the tool used to deliver the prompts.	As discussed above, the video prompts might include timers for appropriate time to complete the task.

Staff	What do you think the positives of video prompting are?	What do you think are the challenges or negatives of using video prompting in employment settings?	What type of consumer do you think video prompting is appropriate for?	As a job coach/ developer/ program manager do you have suggestions for improving the video prompting for employment settings in the future
5	Using video prompting is a helpful tool for people who have a basic understanding of tablets and technology. As long as they have this understanding coming into the job/training site and supervisors and staff do not have to offer much support on using the technology I believe it will be a welcomed accommodation.	I see a couple big challenges with using tablets & video prompting. One being the challenge of caring and using a tablet while trying to do the task at hand. Many jobs are not stationary jobs and require the use of both hands while standing. These positions make using the tablets more challenging than stationary jobs at a desk type setting. I also see a challenge if or when problems arise and cause a deviation from a routine. I think a prompting app with multiple layers or directions would be helpful to solve this problem.	I think video prompting is great for people who are visual learners in stationary jobs or positions that struggle with memory issues.	I think it's a great tool as long as it's a right fit for the consumer and position. I don't think video prompting should be used just to be used. I also think a plan for fading needs to be in place before the tool is put into practice. Video prompting should not be used as a long-term answer, but a short-term training tool.
6	Very useful for those who are uncomfortable having someone looking over their shoulder. This is also useful in situations where having a job coach is not appropriate. Consumer was comfortable with using the video prompts.	Being able to access it when needed. May not have a place to keep the i-pad while not in use. helpful to solve this problem.	Any who learn from "modeling"	No response

Table 11 (continued)

Chapter 5: Discussion

The purpose of this study was to increase the independence (i.e., acquisition, accuracy and completion) of young adults with intellectual and developmental disabilities (IDD) with employment tasks in integrated employment settings, using self-directed video prompting with iPads and the MyPicsTalk app. All participants successfully acquired three vocational tasks in integrated employment settings using the intervention. Finally, all participants successfully generalized two of the three tasks to new materials, people, or settings.

This chapter provides (a) a summary and discussion of study results related to each research question and participant, (b) limitations of the study, (c) recommendations for future research, and (d) recommendations for practice.

Research Question 1

Research Question 1 was: “What are the effects of video self-prompting using iPads on the percentage of employment task steps completed accurately by young adults with IDD in integrated employment settings?” All three participants increased the number of steps completed accurately after intervention was implemented, compared to their baseline scores, as evidenced by visual analysis. Although visual analysis of graphs is the primary means used to evaluate single subject research, group means and PND scores provide additional evidence of effectiveness. Scruggs and Mastropieri (1998) provided guidelines for determining the effectiveness of single subject research based on

the PND. Studies with PND outcomes over 90% are considered to be very effective interventions. Studies with PND scores of 70 to 90% are considered to be effective. Studies with PND scores of 50 to 70% have questionable effects, and PND scores below 50% are generally considered to be ineffective treatments. The group mean increased from 15% correct during baseline to 85% correct in intervention. The overall study had a PND score of 98%. Thus, PND scores concur with visual analysis to indicate that self-directed video prompting was a very effective intervention. Although all three participants showed improvement on acquisition of vocational tasks in integrated employment settings, factors that may have influenced the individual outcomes including tasks, setting, and the generalization of skills, warrant additional discussion.

Discussion on Question 1 By Participants

Perry. Perry was able to complete the tasks of straightening and cleaning shelves of boxes and bags, fish food, and large items with a mean percentage correct in intervention of 85% compared to baseline performance of 16% correct. Perry showed immediate improvement for all three tasks when self-directed video prompting was implemented and continued to improve until video prompting for that task was discontinued. However, Perry protested verbally to the use of video prompting for the first task. He stated that he knew what to do, and did not need to watch videos. He stated people might believe that he was not capable of doing the job. He was reassured that it would not make anyone think he was not capable. Even after this reassurance, he required multiple prompts to navigate to the next video, which resulted in low accuracy for navigation and usage of the iPad in the first task (80% correct) compared to the second and third tasks where his performance on navigation and usage of the iPad was 100%.

Perry's tasks were functionally similar as they all required moving items on a shelf, dusting under the items, dusting the items, replacing the items, and turning the items to face the front, so they appeared neatly. However, Perry was unable to generalize from one type of item (boxes and bags) to another (small bottles of fish food) as his baseline performance for Tasks 2 and 3 did not improve when he began intervention on Task 1. After beginning intervention on the third task (cleaning and shelving large items), Perry's internship was discontinued because he obtained paid employment at the Columbus Zoo, and the study was terminated after three trials on that task.

Cam. Cam was able to complete the tasks of checking out fitness equipment, cleaning a treadmill, and cleaning a stairstepper with a mean percentage correct of 80% compared to a baseline mean of 13%. Cam worked three days a week for 12 weeks at the recreation center. Cam's internship consisted of cleaning equipment, checking equipment in and out, and straightening the weightroom. Straightening the weightroom was a variable task, based on which weights had been taken down by customers, so it was not appropriate for video prompting. Cleaning equipment was also somewhat variable, as there was a cleaning checklist that all student workers completed collaboratively. However, two cleaning tasks were identified that occurred frequently during Cam's work hours (cleaning treadmill & cleaning stairstepper).

Cam was the only participant who had a moderate intellectual disability, paired with communication difficulties, and fine and gross motor deficits. This likely impacted his acquisition of tasks. The number of sessions required by Cam to reach criterion was greater than the other two participants. However, his acquisition of tasks may have also been impacted by the challenges with the fine and gross motor components of individual

tasks. The components of the task that took the most sessions to reach criterion (treadmill) had more gross and fine motor components required than the first task, which Cam reached criterion on in three sessions. The third task (clean stairstepper) had some identical steps to the second task (treadmill), and Cam's rate of acquisition for the third task was accelerated when compared to the second task.

Cam's tasks also had the greatest variability in the number of steps. Each task had more steps than the previous task. Specifically, the first task had 11 steps, the second task had 15 steps, and the third task had 24 steps. However, the third task had similarities with the second task with one step that was repeated four times in the third task, that was also part of the second task (i.e., spray towel five times). The step that followed spray towel five times in both tasks was wiping one of two rails on the equipment. This step had visual similarities that included color (black), width, and a position on the piece of equipment running from the top to the ground on both sides of the equipment.

Additionally, the step of wiping the rail was divided into two steps in the third task, when it had been one step in the second task. This division was implemented in the third task, because Cam continued to struggle with the step of wiping the rails in the second task. He consistently made two errors when wiping the rails in the second task. His first error was not wiping the rail completely. He would switch between the front and back of the rail when wiping it (e.g., wiping the front of the rail on one half and the back of the rail on the second half). His second error involved both a duration and accuracy error in which he would repeatedly wipe the same area of the rail. Because of Cam's history of waiting for a prompt, we allowed him to wipe the rail without a prompt to move to the next step for one session, to see if he would eventually transition to the next

step independently. He never transitioned, but continued to wipe one rail for 2 min and the second rail for 3 min. Cam only got this step correct on both rails of the treadmill one time; but got the step correct on the second rail three times during intervention and one time during maintenance.

After discussions with an occupational therapist and a program manager of the TOPS program who served as the video model for the third task, the step of wiping the rail was broken into two steps for the third task. The step in the third task was to wipe the front of the rail in one continuous motion, starting at a bolt at the top of the rail. This would prevent either error from occurring, if correctly performed as shown in the video. An additional audio prompt and video of the model walking around the side of the stairstepper was also included in the second step of wiping the rail (go to the other side and start at the top ...). This allowed the steps of wiping the front and back of the rail to be completed in two discrete locations. This level of detail in videos may not be necessary for other participants using video prompting, and likely increased total task participation time for Cam for the stairstepper task. However, the potential for improvement in accuracy outweighed the drawbacks. On Cam's last session of completing the stairstepper, he got all four steps (2 steps for each of two rails) related to the rail correct, which may indicate that these changes to the rail step were beneficial in improving his performance on the step.

Another interesting pattern in Cam's data reveals a decline in performance across time for Tasks 1 and 2. This pattern was evidenced by a decline in accuracy in Tasks 1 (check out equipment) and 2 (clean treadmill), and an increase in the amount of total task time to complete Task 2 (clean treadmill). This increase in total task time and decline in

accuracy was directly correlated in Task 2, as evidenced by accuracy and duration errors occurring on the same step across trials. In other words, when he spent longer than the allotted time on a step, he also did not perform the step correctly. For Task 1, his performance dramatically improved from 9% in baseline to 91% for the first four trials of intervention, but then showed a decreasing trend for three trials. This was followed by one trial with 100% accuracy, with a subsequent decreasing trend for 2 trials.

One possible explanation to this regression in performance in Task 1 is Cam seeking out coworker attention. He often attempted to seek out coworker help for task 1 for help on the computer; coworkers were prompted by the experimenter to refrain from helping Cam, unless he made an error that would prevent further steps from being completed. If a coworker assisted Cam in Task 1 in using the computer, the step was counted as incorrect. The small space of the checkout desk made it difficult for coworkers to be physically separated from the participant during intervention. During many sessions, they were closer to the participant than the experimenter to help customers coming to the desk, or they were talking to one another next to the check out equipment computer. The coworkers were not present for the last two intervention sessions for Task 1, and his performance was 100% and 91% correct.

Another potential factor was that two trials in Task 1 (Trial 12 & Trial 14) were interrupted before completion of the task, because a customer came to the desk and the participant was the only one at the desk. In these two instances, the customer's needs took precedence over the research study. Therefore, the job coach stepped in and assisted the participant and customer to fulfill the customer's needs. In both instances, the customer was checking in equipment that they had previously checked out, which was a

different task than the one targeted for intervention. A new checkout equipment trial was begun after the customer had been served, because the previous one could not be resumed as the computer used for checkout is also the one used for check-in equipment. However, his scores on those days are consistent with the trials before and after those trials, so it may have not impacted performance.

In between trials 27 and 28, the hours that Cam worked shifted by an hour. This shift followed a change in job coaches. This potentially affected Cam's results, because cleaning was done on a fixed schedule. Therefore, Cam did not have as much opportunity to clean equipment as he would have if his schedule had remained the same. Specifically, he would have had more opportunity for trials for the treadmill and the stairstepper. More opportunities may have promoted faster acquisition of tasks and longer-term maintenance and generalization data.

Finally, Cam's internship ended after 12 weeks. This prevented the gathering of Long-term maintenance and generalization data for Task 3.

Mac. Mac was able to complete the tasks of coding the tray preparation sheet, assembling an orange dental tray for cleanings, and cleaning the counter in the breakroom with a mean percentage correct of 76% compared to a baseline mean of 17% correct. Mac's first task of completing the coding sheet was done infrequently, and only two opportunities to perform the task were possible in intervention. Frequent tardiness led to Mac's internship being terminated after trial 12, but data continued to be collected on Task 3, because it occurred on a different floor than the dental clinic.

Mac's intervention initially was going to be completed at an athletic center where he was completing a second internship, but the tasks changed daily for all student

workers. This prevented the identification of three tasks for intervention at the athletic center. Additionally, the set up needs of the athletic center always took precedence over routine cleaning that may have been appropriate for intervention. The student workers share responsibility for a list of items of routine cleaning, and that list was begun earlier than Mac arrived each day, which also impacted the identification of three target tasks. Furthermore, Mac was integrating well with peers at the employment site. Student workers work in pairs, so natural supports already existed. Implementing video prompting as a replacement for this natural support may have made it more difficult for Mac to continue to build those peer relationships. Mac likes variety in his day, and a preference for the athletic center may have existed. He was always early for his internship there, and always late for his internship at the dental clinic. Mac is in the process of being hired by the athletic center. For Mac, acquisition of tasks at the dental clinic was promoted by video prompting, but at the athletic center, it was promoted by peers. Both appear to be equally effective as Mac acquired the tasks at both sites.

How Acquisition Results Relate to the Literature

The results of this study are consistent with previous research using self-directed video prompting for vocational tasks (e.g., Cihak et al., 2008; Davies et al., 2002; Kellems & Morningstar, 2012; Van Laarhoven et al., 2009). However, there are key differences between the current study and these studies that make it a contribution to the literature. In Cihak et al. (2008), prompts were limited to audio plus picture. Additionally, the focus of the study was on transition between known tasks. No new vocational tasks were acquired during the intervention. In previous research comparing video prompting to picture prompting, video prompting has been found to be more effective (Mechling &

Gustafson, 2008; Van Laarhoven et al., 2010); so the present study's usage of self-directed video prompting for integrated employment tasks represents an advance in the literature.

In Bereznak et al. (2012), vocational and daily living tasks were taught in mock vocational settings (i.e., teacher workroom and kitchen) using video prompting on an iPhone. However, the students did not maintain the instructed tasks after the iPhone was removed. Therefore, this study represents an advance because it was completed in integrated employment settings, and the students maintained the behavior after the iPad was removed. This same limitation existed in the Davies et al. (2002) study where a vocational mock setting was designed in the workroom at a software company.

Two previous studies utilized self-directed video prompting in integrated employment settings (Kellems & Morningstar, 2012; Van Laarhoven et al., 2009), and one study utilized self-directed video modeling in an integrated employment setting (Van Laarhoven et al., 2007). In Van Laarhoven et al. (2007), self-directed video modeling was used, but participants had difficulty with device usage, and ongoing navigation data were not collected as in the present study. Additionally, there was no attempt to assess generalization to new materials or settings in any of the three self-directed video supports studies completed in integrated vocational settings mentioned above.

Research Question 2

Research Question 2 was: What are the effects of video self-prompting using iPads on the generalization of vocational tasks? Overall, generalization was demonstrated by participants in two of three tasks. For each participant, there was one task that no attempt for generalization was made, because of internships ending or no similar setting,

materials, or people with which to program for generalization. The PND scores for generalization were 100% across the study, which indicates a very effective intervention. The group mean for generalization was 87% correct on steps completed correctly on generalization tasks.

Discussion of Research Question 2 by Participants

Perry. Generalization to new materials was utilized in two tasks in Perry's intervention. The two tasks that had generalization probes were cleaning shelves of boxes and bags and cleaning shelves of fish food. In both tasks, Perry was trained in one section of the store for intervention with the video prompts, but generalization was assessed in a different section of the store that had the corresponding materials. Perry performed generalization tasks at a percentage correct of 85% (range: 73%–94%). Perry had differences in generalization results between Tasks 1 and 2. Task 1 had a mean percentage correct of 79.5%, whereas Task 2 had a mean percentage correct of 90.5% correct. Two different factors may have contributed to this improvement in generalization performance in Task 2 compared to Task 1. The generalization tasks for Task 2 was completed in the same aisle as the intervention tasks, but for Task 1 were located in a different aisle.

Cam. The forms of generalization used in Cam's employment setting were response maintenance with no video prompting, generalization to new people, and generalization to new materials. Cam's overall performance on generalization tasks for the study was 89% correct (range: 75%–94%). During generalization with authentic customers in Task 1, Cam's performance was between 82% and 91% correct with a mean

of 89.2% correct. For response maintenance with the treadmill without video prompting, Cam's performance was between 80% and 94% correct with a mean of 90% correct. For generalization to new materials, Cam cleaned a different type of treadmill with 75% correct.

Generalization has been a problem identified by job coaches working with Cam in several previous internship sites. Cam's relatively similar performance on generalization tasks to intervention tasks is promising, because it shows that when a task is mastered, similar tasks may also be mastered. Additionally, Cam has struggled in the past with generalizing to new people. He may complete a task in the presence of one person, but not in the presence of another. However, he was able to maintain performance of checking out equipment in the presence of authentic customers versus pseudo-customers. Using self-directed video prompting is a form of self-management intended to promote generalization through learning a strategy for acquisition of new tasks that can be applied to a variety of settings and tasks.

Recently, Cam began a new internship delivering mail in a building at the medical center. Video prompts were created for the job coach to implement. With Cam's experience with video prompting, it was thought he would need relatively few prompts to utilize the iPad. However, he required multiple prompts to navigate to the next step in the task in the first three days of his internship. He also needed modeling to find the app and select the task. There had been a time delay of 5 weeks between the end of the study and the beginning of the internship. This lack of generalization of device usage and navigation to a new setting may indicate that Cam needs additional programming for generalization for it to be used in a variety of settings. However, it may also be attributed

to the lapse of device usage between the two settings. Continuing to use a self-prompting device intermittently may be necessary for individuals with more intensive disabilities to maintain the skills needed for navigation and usage.

Mac. Mac completed generalization tasks for two of his tasks. His first task was only completed twice during intervention and did not have a similar task or materials to measure generalization. His mean performance for generalization tasks for Tasks 2 and 3 was 89% correct (range: 76%–100%). Specifically, he assembled red dental trays as a generalization for assembling orange trays. These trays differed from orange trays by the inclusion of red tools instead of orange tools. In assembling red trays for generalization, Mac did not watch video prompts. However, the task list with picture prompts was available on the iPad, and Mac navigated to the picture task list at the beginning of the first generalization task and twice during the task, navigated to the step he was on to view the picture. He did not refer to the iPad in subsequent trays he assembled. Paired with the textual prompt on the coding sheet, Mac was able to demonstrate response stimulus generalization to the combination of textual and picture prompts. He did not require video prompting for assembling a red dental tray. His performance for assembling red trays was 96% (range: 87%–100%). Mac's third task consisted of cleaning the counter in the breakroom. The generalization task consisted of cleaning a counter in a classroom at the Nisonger Center. His performance on the generalization task was 80% correct (range: 76%–84%).

How Generalization Results Relate to the Literature

The positive results of generalization are consistent with previous research utilizing technology-mediated self-prompting for daily living skills (e. g., Briggs et al.,

1990; Hansen & Morgan, 2008). Previous research on completion of vocational tasks in integrated employment settings have not included generalization to new tasks, materials, people, or settings as part of their procedures. Therefore, the positive generalization results in the present study represent an advance in the literature.

Response maintenance was assessed in all four previous studies utilizing self-directed video prompting in integrated employment settings. Response maintenance was assessed in one data point for one of three tasks for the single participant in Van Laarhoven et al. (2009). Similarly, one data point was used in Van Laarhoven et al. (2007) for three tasks for one participant, with positive results that were equivalent to intervention performance. In Bereznak et al. (2012), response maintenance was assessed in all three participants. However, video prompting had to be re-implemented for all three participants because of a substantial decline in accuracy when video prompting was withdrawn in maintenance. In the present study, response maintenance occurred in one task for one participant in which it was measured (Cam). In Kellems and Morningstar (2012), maintenance was assessed for all three participants across two of three tasks. However, the iPod with video models was utilized during maintenance settings, which is different from assessing maintenance without watching video supports.

Furthermore, response maintenance was also inherent in generalization to new settings and materials used in all generalization tasks. Participants performed generalization tasks without video prompting. Thus, they had to generalize both the skills and the response stimulus. Previously, they had video prompts giving step-by-step directions for the intervention task. In generalization tasks, a single textual prompt (Cam & Mac), verbal prompt (Perry), or picture prompt task list (Mac) was used to prompt task

completion. The single textual prompt represents another form of generalization, the common stimuli that peers use to prompt task completion as these textual prompts are the same prompts used by employees in both the dental clinic and the recreation center. This result in the current study of following common stimuli peers use is similar to results in response maintenance in cooking tasks in a restaurant by one participant in Van Laarhoven et al. (2007) who utilized recipes coworkers used as common stimuli that prompted task completion of the intervention task previously instructed with video.

Research Question 3

Research Question 3 was: What are the effects of training adults to use an iPad with modeling and least to most prompting on the task accuracy and correct navigation of a training task?

When using the training task, participants acquired the navigation and usage of the iPad and MyPicsTalk to criterion levels (90% across two trials) in two to five trials. The participants also completed the training task with 90% accuracy or higher in two to five sessions. A functional relation between the training and improved accuracy in training task completion and navigation accuracy was demonstrated through improvement only when the training on device usage was implemented. Navigation of the iPad and MyPicsTalk app was measured throughout the study. Overall, the participants had a mean of 95% correct on navigation of the iPad and the app throughout the study. An ascending trend across phases is evident in the means of the group with a mean of 88% correct on Task 1, 96% correct on Task 2, and 99% correct on Task 3. This suggests that usage of the device improves over time. This result closely parallels conclusions by Van Laarhoven et al. (2009) where a decrease in prompts for technology

use occurred in the second and third tasks targeted for intervention.

Discussion of Research Question 3 by Participants

With two participants, there were factors related to navigation that potentially affected the outcomes in this study. Initially, when video prompting was introduced in Task 1, Perry was resistant to the use of video prompting on the iPad, and required reassurance that the use of video prompting would not make supervisors, or his job coach think he was not capable of performing his job. He required frequent prompts to watch the next video before performing the task; thus, his accuracy in navigation for Task 1 (80%) was much lower than Tasks 2 and 3 (100%). Once he was comfortable with using video prompting at his internship site, he did not express any further discontent with video prompting.

Cam had difficulties in navigation, particularly in Tasks 1 and 2. This may have contributed to the lengthy intervention phase in Task 2. His navigation error in Task 2 frequently occurred in two spots. Specifically, in step 6 when he was to spray the other side of the treadmill, and in step 12 when he was to spray the towel five times. These two steps were both a repetition of a previous step, just completed on the other side of the treadmill. His error consisted of navigating one step too far on these steps, and was heard twice to say that he had already done that. After trial 33, a verbal prompt consisting of the statement, “Remember, Cam you have to do that twice, go back a step and watch the video” was implemented in future trials when he made that error. That prompt was used in three subsequent trials (34, 36, and 37) after which he no longer made that specific navigation error.

How the Results of Training and Navigation Compare to the Literature

The training for device usage in previous research has frequently left out specifics of required criterion levels and training procedures (e. g., Kellems & Morningstar, 2012; Furthermore, the training procedures have had mixed results. For example, one participant in Bereznak et al. (2012) shifted to teacher-directed video prompting from self-directed video prompting, because they could not acquire device usage after multiple training sessions. Similarly, the participants in Van Laarhoven et al. (2007) never acquired independent device usage and navigation in the training or subsequent intervention. The successful pairing of a training package consisting of prompting and a training task parallels successful device training in two previous studies of technology mediated self-prompting in vocational settings (Cihak et al., 2008; Van Laarhoven et al., 2009).

The collection of ongoing navigation and accuracy data for self-directed video prompting in integrated employment settings is also an advance in the literature. Previous research with video supports in integrated employment settings did not collect these ongoing data (e.g., Kellems & Morningstar, 2012). Additionally, one of the previous research studies involving self-directed video prompting in vocational settings completed some navigation steps for participants (i.e., Bereznak et al., 2012). Specifically, the experimenter navigated to the correct task, and the participant had only to navigate through the task. Another study conducted by Van Laarhoven et al. (2007) indicated continued navigation difficulties, but provided no data for navigation. Similarly, Cihak et al. (2008) specified that students were prompted when navigation errors were made, but provided no information on how frequently that occurred. One previous study (i. e., Van Laarhoven et al., 2009) provided data on the number of prompts required to use

technology appropriately, with a similar decrease in errors made in navigation across tasks to that which was noted in the present study.

Research Question 4

Research Question 4 was: What are participants' and job coaches' opinions about the use of self-directed video prompting of vocational tasks in integrated employment settings?

Social validity was assessed with both participants and program staff. Social validity with participants was assessed through a structured interview conducted at the end of the study. Social validity with program staff was assessed through an anonymous survey conducted through Survey Monkey. No identifying information had to be entered to access the survey. It was not connected to respondents in any way.

Participant Social Validity

Overall, interviews with participants indicate they felt positive about the procedures, goals, and effects of the intervention. All three participants indicated that they liked using the iPad for video prompting. Specific comments they made related to using the device were that it was easy to watch, fun, and provided help for learning new tasks in new settings they had never worked in before. All three participants indicated they would use it to learn new tasks in the future, although one participant (Mac) stated that his job coach and coworkers could also teach him new tasks equally well. This assertion is supported by baseline data collected in a second internship site in which he had steadily increasing task accuracy on tasks learned from coworkers and job coaches. Some things that the participants did not like about the intervention were that the videos were too long to watch, especially if they already knew the task. Some recommendations

they made for future use of iPads and video prompting in employment settings was to allow participants to watch videos while they performed tasks, to put them on their iPads they owned rather than ones belonging to the experimenter or program, and to put them on a smaller device more convenient to carry around. These recommendations by participants align with previous applications of video prompting in integrated employment settings. Specifically, smaller devices than the iPad were used in the previous research studies conducted in integrated employment settings (Bereznak et al., 2012, Cihak et al., 2008; Kellems & Morningstar, 2012; Van Laarhoven et al., 2007; 2009) where devices such as handheld computers, iPods, and iPhones were used. In one previous study conducted in an integrated employment setting, the participant listened to audio prompts while they completed vocational tasks (Van Laarhoven et al., 2009).

The positive comments by the participants about video prompting for vocational tasks align with the social validity results in previous research (Bereznak et al., 2012; Kellems & Morningstar, 2012; Van Laarhoven et al., 2007; 2009). However, social validity was only formally assessed with participants in two previous studies utilizing technology mediated self-prompting in integrated employment settings (Bereznak et al., 2012; Van Laarhoven et al., 2009).

Program Staff Social Validity

Social validity for staff was assessed through a rating scale and through open-ended questions delivered in an anonymous online survey format. Overall program staff rated the intervention as an effective strategy for promoting task acquisition. Specifically, all six respondents strongly agreed or agreed that the tasks were important to the participant's job, the app was appropriate to use for video prompting in employment, and

that the participant was able to learn from video prompting. Four respondents agreed or strongly agreed that the participant became more independent, and two respondents were neutral on this question. Five of six respondents identified video prompting as appropriate for vocational settings, with one participant rating their response as neutral on this question. Four of six respondents also found it to be socially appropriate for the population and age used in the study. The lowest rated response was whether the participant could use the iPad independently with two respondents agreeing, two respondents disagreeing, and two respondents indicating they had not directly observed iPad use so they could not rate the behavior. Additionally, five respondents indicated they would use video prompting in the future if the videos were already created, and four respondents indicated they would like to learn to add new videos to the iPad. One respondent did not feel comfortable using the iPad to show previously created materials or creating new materials.

When looking at individual responses to open ended questions, program staff indicated positives of video prompting as being comprehensive, yet not intrusive; consistent; increases independence; reduces reliance on others; potentially efficient in reducing job coaching costs; and increases self-management. The program staff indicated negatives or challenges associated with video prompting: requiring prompting to learn device usage; creating prompt dependence; not appropriate for every setting, potential hinderance to efficiency; challenging to capture certain tasks such as those that use specialized equipment; limited to tasks that are repetitive; doesn't take into account variations in tasks typical of integrated employment; challenging to train staff on its development and usage. The type of consumers identified as appropriate for using video

prompting with were participants who need frequent prompting, visual learners, multi-modal learners, participants who have fine motor skills necessary for device usage, audio learners who can listen to the embedded audio direction, participants who can be trained to operate the device, and participants who are self-determined enough to realize they need a prompt. Finally, program staff made recommendations for future implementation of self-directed video prompting in integrated employment. Two of four respondents indicated that a smaller device may be more appropriate for integrated employment settings. Additional recommendations were the use of headphones, especially in office settings, maintaining a library of prompts so they could be used in the future, and embedding timers to allow self-management of duration of tasks.

Themes in Social Validity Results

Overall in participant and program staff social validity data, there are overarching themes related to video prompting and the use of iPads in employment settings. The first two themes were also outlined in the social validity data in Kellems and Morningstar (2012).

Video prompting on the iPad helps with task acquisition. The participants and program staff indicated that the videos helped the participants acquire vocational tasks.

Video prompting on the iPad is socially acceptable in employment settings. The participants and job coaches thought it was appropriate for the age and population who were a part of this study.

Video prompting using iPads needs modifications to provide better supports in the future. Specifically, participants and program staff identified that smaller devices may be more appropriate for some settings. Participants also indicated that shorter videos or

watching videos while performing the task may make video prompting more effective. Program staff indicated that using earbuds or timers would be helpful to include in the future.

Video prompting is limited to specific kinds of tasks. This theme consistently occurred across program staff social validity responses. Specifically, the type of task is limited to those that are repetitive and occur in the same sequence every time. Tasks that are variable, require specialized equipment, include frequent movement, or that are dependent on environmental needs may be less appropriate for video prompting.

Limitations and Future Directions for Research

There are several limitations to this study that should be considered in developing future research. First, the small numbers of participants make it difficult to generalize the results to a larger population. More research on the use of self-directed video prompting should be implemented in integrated employment settings to further validate the results of this study and previous studies utilizing video prompting in integrated settings.

Second, generalization was assessed in four different ways: response maintenance, generalization to new settings, generalization to new people, and generalization to new materials. Generalization was also assessed in only two of each participant's three tasks. Generalization was not assessed in the third task, because of time constraints and limited availability of a generalization task. Future research could identify one form of generalization to strengthen the evidence for generalization of self-directed video prompting for vocational tasks, and assess that form of generalization across all the tasks targeted for intervention.

Third, the size of the device may have impacted results. Both participants and

program staff identified the large size of the iPad as problematic. However, one participant had fine motor deficits, and one participant had a visual impairment, which was a factor in the selection of the iPad and the MyPicsTalk app as the tool for intervention. MyPicsTalk allowed for the video to be shown the entire width of the screen, and also allowed for both swiping or tapping in navigation. Future research could look at the characteristics of participants in the selection of a device, and compare screen sizes in best meeting the needs of individuals.

Fourth, this research was conducted in integrated employment settings, which inherently have frequent changes associated with targeted vocational tasks. Specifically, time tasks are completed, the frequency with which targeted tasks were part of the participant's job responsibilities, additional tasks that take precedence over the targeted tasks, interference of coworkers, and differing requirements based on the supervisor or coworkers were evident in this research. Future research could look at controlling some of these factors. Similarly, some employment settings in this study had developed a natural support system for all employees, in which they worked in pairs. This made the use of video prompting a potential deterrent to the development of these natural supports. Additionally, baseline data included in vivo prompting. This could have allowed for ascending baseline trends, but did not. Procedures for handling these employment-setting factors should be a part of future research.

Fifth, long term maintenance data were limited, because of the short-term nature of the integrated employment internships in which the participants were engaging. Future research should attempt to collect maintenance probe data over longer periods of time in order to provide more evidence of behavior change over time.

Sixth, the focus of this study was an intervention to remediate one challenge in employment, the acquisition of vocational tasks. This inherently limits the applicability of the intervention to be a solution for all employment challenges. This intervention did not include components to work on challenges specifically faced by the participants in this study that became evident during the intervention outside the scope of the study. Specifically, arriving to work on time, and transitioning to different tasks were challenges that emerged during the study. Rather, the job coach provided supports for those areas. Future research may look at including more components targeted to social skills, difficulties transitioning between tasks, and personal responsibility. Additionally, future research may look at the impact of video prompting on long-term employment outcomes, as that also was not the focus of this study.

Seventh, the use of prompting the participant through completion of baseline tasks represents a limitation because it provides instruction during baseline. Future studies could turn the participant around during baseline tasks when an error is made to provide true baseline, rather than a baseline method that provides instruction.

Recommendations for Practice

This study supports previous research that shows benefits for the use of video prompting in integrated employment settings (e. g., Bereznak et al., 2012, Kellems & Morningstar, 2012; Van Laarhoven et al., 2007; 2009). However, several considerations for practice also were evidenced when implementing the procedures of this study. First, the characteristics of the participant may warrant the selection of a particular device. Specifically, coexistence of fine motor deficits, or visual impairments may warrant the selection of a larger device. Similarly, smaller or larger devices may also be necessary

based on the requirements of the setting. For example, stationary sites such as the dental clinic were more conducive to the use of the iPad for video prompting over sites where frequent movement was required (i. e., recreation center).

Social validity data indicated a need for staff training on both implementation of the intervention and on creating new video prompts to match changing job requirements. Similarly, staff procedures for the creation and storage of video prompts may be necessary to allow them to be used in subsequent placement of participants in that employment setting. Involving staff in the creation of self-directed video prompting may alleviate some of the fears associated with self-directed video prompting. In a previous attempt to implement self-directed video prompting at an integrated employment site, the director of the site indicated to the experimenter that self-directed video prompting was an attempt to do away with job coaches.

The identification of settings and tasks was the single most challenging aspect of implementing video prompting in integrated employment. A framework for identification of tasks may make the process easier to identify whether a setting and/or task is appropriate for using self-directed video prompting. A flowchart (see Figure 12) may be beneficial to practitioners to aide in identifying the applicability of a setting and tasks for self-directed video prompting.

Figure 12. Flowchart for determining applicability of setting and tasks for video prompting.

Conclusion

Self-directed video prompting was effective at helping three male participants

with intellectual and developmental disabilities acquire three vocational tasks in integrated employment settings. Participants were trained to use an iPad with the MyPicsTalk app through a training package consisting of least to most prompting and a training task prior to beginning intervention. Participants were also able to generalize to different settings, materials, or people in two of their three tasks. Although integrated employment settings have challenges associated with them, the use of self-management supports to increase successful task acquisition, have great potential to help participants to overcome traditional barriers to success in employment. Securing and maintaining employment will likely impact not only the finances of the individual with IDD, but also their quality of life through bringing purpose and social relationships typical of employment.

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Appendix A: IRB Permission Form

The Ohio State University Consent to Participate in Research

Study Title: Transition Options in Postsecondary Setting for Students with Intellectual Disabilities

Researcher: Margo Izzo, PhD

Sponsor: US Department of Education, Office of Post-Secondary Education

This is a consent form for research participation. It explains what this project is about and what will happen if you decide to participate.

Your participation is voluntary. You don't have to participate and nobody will be upset with you if you decide not to participate.

Please consider the information carefully. Feel free to ask questions and to talk to other people, like your parents or teachers, before making your decision whether or not to participate. If you decide to participate, you will be asked to sign this form and will receive a copy of the form. **Only sign this form if you are sure you want to be in this project.**

Purpose:

The reason we are doing this project is to try to help young adults with intellectual or developmental disabilities achieve their goals in life. Everyone has different goals. Some things this project focuses on are: adult learning or learning more about things that interest you, connecting your interests, personality, skills and abilities to satisfying employment, acquiring skills to live more independently, and maintaining or improving your health and wellness. This project will help us understand the types of supports adults with intellectual and developmental disabilities need to succeed in college.

Procedures/Tasks:

If you decide to be in this project, you will participate in college experiences and will receive natural supports to help you be successful. These supports will depend on your individual needs and employment goals. Supports might include educational and job coaching, mentoring, family support, volunteer peer support, academic advising, tutoring, technology and travel training, and person-centered planning. This college experience will increase your self-determination through your participation in the following opportunities: 1) engaging in learning (enrolling in or auditing college courses); 2) participating in career exploration (internships and employment); and 3) independent living experiences (resident halls and campus life).

Duration:

Depending on your goals and choices, you can stay in this project for more than one year. While you are in this project, you will spend one hour or more with your advisor every week.

You can quit the study at any time. If you decide to stop participating in the study, nothing bad will happen to you. Your decision will not affect your future relationship with The Ohio State University or the Nisonger Center.

Risks and Benefits:

What are the risks of being in this project?

Like other young adults going to college for the first time, you may worry that you are not ready or that college is too much for you to handle. This is normal. You will not be alone; you will have exactly as much support as you need through this project.

What are the benefits of being in this project?

We think you will benefit from opportunities to become self determined through engaging in college classes, internships and employment, participating in health and wellness activities, developing independent living skills, gaining technology skills and the overall college experience; which offers you the opportunity to build a network of natural supports that can assist you in reaching your goals.

As part of this project, you may have an opportunity to use universal and/or assistive technology equipment and devices that may support you in achieving your goals. Your use of this equipment depends on your participation in this project. If you decide not to participate or to stop participating, any equipment or devices purchased by this project must be returned to the Special Education and Transition Department at the Nisonger Center on The Ohio State University main campus.

This project will also help you develop an electronic portfolio or record of your learning experiences during college. This portfolio can help you show a potential employer that you have the knowledge and skills to do a job and be a valued productive employee.

Confidentiality:

Efforts will be made to keep your study-related information private. But there may be times when your information must be shared with other people (outside of this project). For example, personal information about your participation in this study may be shared if required by state law. Also, your records may be reviewed by the following groups:

- Office for Human Research Protections or other federal, state, or international regulatory agencies;
- The Ohio State University Institutional Review Board or Office of Responsible Research Practices;
- The US Department of Education, who is supporting this study.

Incentives:

You will not be paid for participating in this project.

Participant Rights:

Your participation is voluntary. You don't have to participate and nobody will be upset with you if you decide not to participate. If you are a student, your decision will not affect your grades. If you are working now, your decision will not affect your job.

If you choose to participate in the study, you can quit the study at any time. If you decide to stop participating in the study, nothing bad will happen to you. Your decision will not affect your future relationship with The Ohio State University or the Nisonger Center.

An Institutional Review Board responsible for protecting people in studies at The Ohio State University reviewed this research project and thought it was acceptable, according to applicable state and federal regulations and University policies designed to protect the rights and welfare of participants in research.

Contacts and Questions:

If you or your family has questions, concerns, or complaints about the study, you should contact the transition program manager, Evette Simmons-Reed (614) 247-8970.

For questions about your rights as a participant in this study or to discuss other study-related concerns or complaints with someone who is not part of the research team, you may contact Ms. Sandra Meadows in the Office of Responsible Research Practices at 1-800-678-6251.

If you are harmed as a result of participating in this study or for questions about a study-related harm, you may contact the principle investigator, Margo Izzo, (614) 292-9218.

Signing the consent form

I have read (or someone has read to me) this form and I know that I am being asked to participate in a research study. I have had the chance to ask questions and have had them answered to my satisfaction. I voluntarily agree to participate in this study.

I am not giving up any legal rights by signing this form. I will be given a copy of this form.

Printed name of participant

Signature of participant

Date and time AM/PM

Investigator/Research Staff

I have explained the research to the participant or his/her representative before requesting the signature(s) above. There are no blanks in this document. A copy of this form has been given to the participant or his/her representative.

Printed name of person obtaining consent

Signature of person obtaining consent

Date and time AM/PM

Appendix B: Permission for Pictures/Video

PERMISSION FOR VIDEOS/PHOTOGRAPHS

1. I give my permission for videos/photographs taken of ☐ myself and/or ☐ my child or ward

Name(s) of individual(s) in the photograph(s)

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Please check one: _____ **Yes, I give permission** _____ **No, I do not give permission**

2. I give permission for my or my child's name to be published in the caption of the photo.

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Signature of Student (or Parent/Guardian)

Date

Print name of individual, parent, or guardian

Address

Apt. Number

City

State

Zip Code

Home phone number

Work/Cell phone number

Please FAX to 614-685-6373 or MAIL to:

**Program Assistant
257 McCampbell Hall
1581 Dodd Dr.
Columbus, OH 43210**

Appendix C: Task Analyses

Pet Store

Task 1: Clean/straighten shelves of boxes and bags

1. Get towel and cleaner
2. Get cart
3. Move cart to shelf by where you are working
4. Start with the left rows of items
5. Move 1/2 of rows of items to cart from top shelf, keeping them in order (4-5 rows)
6. Wipe shelf, starting at the back, moving side to side to front
7. Wipe front of shelf without knocking price tag off
8. Move 2nd half of items with arm down
9. Wipe 2nd half of shelf, starting at the back, going from side to side to front
10. Wipe front of shelf
11. Move each row of items back where they go
12. Dust items
13. Dust items in cart
14. Move items from cart back to correct location
15. Start at the left, top and face shelf (move items to front where they touch hand)

Task 2: Clean/straighten shelves of fish food

1. Get towel and cleaner
2. Get cart
3. Move cart to shelf by where you are working
4. Start with the left rows of items
5. Move 1/2 of rows of items to cart from top shelf, keeping them in order (8-10 rows)
6. Wipe shelf, starting at the back, moving side to side to front
7. Wipe front of shelf without knocking price tag off
8. Move 2nd half of items with arm down
9. Wipe 2nd half of shelf, starting at the back, going from side to side to front
10. Wipe front of shelf
11. Move each row of items back where they go
12. Dust items as you move them back
13. Dust items in cart
14. Move items from cart back to correct location
15. Start at the left, top and face shelf (move items to front where they touch hand)

Task 3: Clean/straighten shelves of large items

1. Get towel and cleaner
2. Start with the left rows of items
3. Move first row of items to floor from shelf, keeping them in order
4. Wipe shelf, starting at the back, moving side to side to front
5. Wipe items
6. Put items back
7. Face items
8. Move 2nd row of items
9. Wipe shelf
10. Wipe items
11. Put items back
12. Face items
13. Move 3rd row of items to floor
14. Dust shelf
15. Dust items
16. Stack items on top one another if there are too many to fit in a row
17. Start at the left, top and face shelf (move items to front where they touch hand)

Recreation Center

Task 1: Check Out Equipment

1. Looks at patron when they come to desk
2. Gets id from patron
3. Closes out any extra screens open (if applicable)
4. Clicks in member info box with mouse (if needed)
5. Scans card correctly
6. Returns card
7. Gets correct equipment
8. Gives patron equipment requested
9. Clicks equipment category they are checking out
10. Double clicks the name of the item
11. Clicks check out

Task 2: Clean Treadmill

1. Get the towel and cleaner
2. Spray one side at least 4 times all the way down
3. Wipe back corner
4. Wipe top
5. Wipe front corner of rail
6. Spray other side at least 4 times all the way down
7. Wipe back corner
8. Wipe top
9. Wipe front corner
10. Spray towel
11. Wipe rail
12. Spray towel
13. Wipe rail
14. Spray front rail and monitor
15. Wipe front rail and monitor
16. Put the towel and cleaner away or go to the next treadmill

Task 3: Clean stair stepper

1. Get the towel and cleaner
2. Spray back stand 5 times
3. Wipe back stand
4. Spray middle bar
5. Wipe middle bar
6. Spray towel 5x
7. Start at the top of rail at silver bracket and wipe front of the rail down to the ground
8. Spray towel 5 times
9. Wipe back of the rail, starting at silver bracket and wipe down to the ground
10. Spray towel 5x
11. Start at the top of rail at silver bracket and wipe front of the rail down to the ground
12. Spray towel 5 times
13. Wipe back of the rail, starting at silver bracket and wipe down to the ground
14. Spray back of the machine
15. Wipe back of the machine
16. Spray right side of machine
17. Wipe right side by going top to bottom
18. Spray left side of the machine
19. Wipe left side by going top to bottom
20. Spray front of the machine 3 times
21. Wipe front of the machine
22. Spray towel 5 times
23. Wipe back of monitor
24. Move on to next machine or put stuff away

Dental Clinic/Breadroom

Task 2: Assemble Orange Cleaning Trays

1. Get trays
2. Put tray liner on tray
3. Put bib on tray
4. Put jelly tips on trays
5. Put high speed suction tips on trays
6. Put cotton tip on trays
7. Put green tip saliva ejector on tray
8. Put 2x2s on tray
9. Put water tip on tray on tray put big strip on tray
10. Put blue tools on tray from cabinet
11. Put silver tip from cabinet on tray
12. Put tube on tray from cabinet
13. Put tray on rack

Task 3: Clean counter in the break room

1. Clean counter
2. Go get the towel and the Mr. Clean from _____.
3. Set items on the counter.
4. Throw out trash or large pieces of food and move items before spraying or wiping
5. Make sure the spray nozzle is turned to "on" or "spray".
6. Start on the right end and spray 1-2 times, then spray the middle 1-2 times, and the end 1-2 times.
7. Start at the right end, go side to side until you have wiped counter you have sprayed. Stop when you reach the edge
8. When you get to the last row, sweep the crumbs into one hand and throw them in the trash can
9. Get a paper towel
10. Start on the right end and wipe side to side until you have dried the whole counter
11. Put your cleaning materials away.

Appendix D: Procedural Integrity Form Sample (Treadmill)

give a 1 for correct and 0 for incorrect. Give a N/A if the participant did not make an error for the experimenter to follow least to most prompting "If participant does not select the task correctly, the experimenter follows least to most prompting to assist them (verbal, gestural, partial physical, physical)"

	trial 1	trial 2	trial 3	trial 4	trial 5
1. Experimenter asks participant to complete the task					
2. Experimenter lets participant turn on iPad					
3. If participant does not turn on iPad correctly, the experimenter follows least to most prompting to assist them (verbal, gestural, partial physical, physical)					
4. Experimenter lets participant slide arrow					
5. If participant does not slide the arrow correctly, the experimenter follows least to most prompting to assist them (verbal, gestural, partial physical, physical)					
6. Experimenter lets participant select app					
7. If participant does not select the app correctly, the experimenter follows least to most prompting to assist them (verbal, gestural, partial physical, physical)					
8. The experimenter allows participant to select task					
9. If participant does not select the task correctly, the experimenter follows least to most prompting to assist them (verbal, gestural, partial physical, physical)					
10. Experimenter lets the participant play the first step (get towel and cleaner) of the task before beginning.					
11. If participant does not play the video, the experimenter follows least to most prompting to assist them (verbal, gestural, partial physical, physical)					
12. If participant completes does not begin step or stops for ten or more seconds the experimenter prompts them to keep going					
13. If participant completes step incorrectly, the experimenter has them rewatch video or follows least to most prompting to assist them (verbal, gestural, partial physical, physical) or has them rewatch video					
14. Experimenter allows participant to navigate to step 2 (spray one side at least 4 times all the way down) independently and start video					
15. If participant does not navigate correctly or play the video, the experimenter follows least to most prompting to assist them (verbal, gestural, partial physical, physical)					
16. If participant completes does not begin step or stops for ten or more seconds the experimenter prompts them to keep going with least to most prompting (verbal, gestural, partial physical, physical)					
17. If participant completes step incorrectly, the experimenter has them rewatch video or follows least to most prompting to assist them (verbal, gestural, partial physical, physical) or has them rewatch video					
18. Experimenter allows participant to navigate to step 3 (wipe back corner, top, and front corner) independently and start video					
19. If participant does not navigate correctly or play the video, the experimenter follows least to most prompting to assist them (verbal, gestural, partial physical, physical)					
20. If participant completes does not begin step or stops for ten or more seconds the experimenter prompts them to keep going with least to most prompting (verbal, gestural, partial physical, physical)					
21. If participant completes step incorrectly, the experimenter has them rewatch video or follows least to most prompting to assist them (verbal, gestural, partial physical, physical) or has them rewatch video					
22. Experimenter allows participant to navigate to step 4 (spray other side at least 4 times all the way down) independently and start video					
23. If participant does not navigate correctly or play the video, the experimenter follows least to most prompting to assist them (verbal, gestural, partial physical, physical)					
24. If participant completes does not begin step or stops for ten or more seconds the experimenter prompts them to keep going with least to most prompting (verbal, gestural, partial physical, physical)					
25. If participant completes step incorrectly, the experimenter has them rewatch video or follows least to most prompting to assist them (verbal, gestural, partial physical, physical) or has them rewatch video					
26. Experimenter allows participant to navigate to step 5 (wipe back corner, top, and front corner) independently and start video					
27. If participant does not navigate correctly or play the video, the experimenter follows least to most prompting to assist them (verbal, gestural, partial physical, physical)					
28. If participant completes does not begin step or stops for ten or more seconds the experimenter prompts them to keep going with least to most prompting (verbal, gestural, partial physical, physical)					
29. If participant completes step incorrectly, the experimenter has them rewatch video or follows least to most prompting to assist them (verbal, gestural, partial physical, physical) or has them rewatch video					
30. Experimenter allows participant to navigate to step 6 (spray towel 5 times) independently and start video					
31. If participant does not navigate correctly or play the video, the experimenter follows least to most prompting to assist them (verbal, gestural, partial physical, physical)					
32. If participant completes does not begin step or stops for ten or more seconds the experimenter prompts them to keep going with least to most prompting (verbal, gestural, partial physical, physical)					
33. If participant completes step incorrectly, the experimenter has them rewatch video or follows least to most prompting to assist them (verbal, gestural, partial physical, physical) or has them rewatch video					
26. Experimenter allows participant to navigate to step 7 (wipe front and back of rail) independently and start video					
34. If participant does not navigate correctly or play the video, the experimenter follows least to most prompting to assist them (verbal, gestural, partial physical, physical)					
35. If participant completes does not begin step or stops for ten or more seconds the experimenter prompts them to keep going with least to most prompting (verbal, gestural, partial physical, physical)					

36. If participant completes step incorrectly,the experimenter has them rewatch video or follows least to most prompting to assist them (verbal, gestural, partial physical, physical) or has them rewatch video					
37. Experimenter allows participant to navigate to step 8 (spray towel 5 times) independently and start video					
38. If participant does not navigate correctly or play the video, the experimenter follows least to most prompting to assist them (verbal, gestural, partial physical, physical)					
39. If participant completes does not begin step or stops for ten or more seconds the experimenter prompts them to keep going with least to most prompting (verbal, gestural, partial physical, physical)					
40. If participant completes step incorrectly,the experimenter has them rewatch video or follows least to most prompting to assist them (verbal, gestural, partial physical, physical) or has them rewatch video					
41. Experimenter allows participant to navigate to step 9 (wipe front and back of rail) independently and start video					
42. If participant does not navigate correctly or play the video, the experimenter follows least to most prompting to assist them (verbal, gestural, partial physical, physical)					
43. If participant completes does not begin step or stops for ten or more seconds the experimenter prompts them to keep going with least to most prompting (verbal, gestural, partial physical, physical)					
44. If participant completes step incorrectly,the experimenter has them rewatch video or follows least to most prompting to assist them (verbal, gestural, partial physical, physical) or has them rewatch video					
45. Experimenter allows participant to navigate to step 10 (spray front rail and monitor) independently and start video					
46. If participant does not navigate correctly or play the video, the experimenter follows least to most prompting to assist them (verbal, gestural, partial physical, physical)					
47. If participant completes does not begin step or stops for ten or more seconds the experimenter prompts them to keep going with least to most prompting (verbal, gestural, partial physical, physical)					
48. If participant completes step incorrectly,the experimenter has them rewatch video or follows least to most prompting to assist them (verbal, gestural, partial physical, physical) or has them rewatch video					
49. Experimenter allows participant to navigate to step 11 (wipe front rail and monitor) independently and start video					
50. If participant does not navigate correctly or play the video, the experimenter follows least to most prompting to assist them (verbal, gestural, partial physical, physical)					
51. If participant completes does not begin step or stops for ten or more seconds the experimenter prompts them to keep going with least to most prompting (verbal, gestural, partial physical, physical)					
52. Experimenter allows participant to navigate to step 12 (wipe any drops left/put towel and cleaner away) independently and start video					
53. If participant does not navigate correctly or play the video, the experimenter follows least to most prompting to assist them (verbal, gestural, partial physical, physical)					
54. If participant completes does not begin step or stops for ten or more seconds the experimenter prompts them to keep going with least to most prompting (verbal, gestural, partial physical, physical)					
55. If participant completes step incorrectly,the experimenter has them rewatch video or follows least to most prompting to assist them (verbal, gestural, partial physical, physical) or has them rewatch video					
56. If participant completes step incorrectly,the experimenter has them rewatch video or follows least to most prompting to assist them (verbal, gestural, partial physical, physical) or has them rewatch video					
54. Experimenter gives noncontingent praise for working today					
Date					
Percent Correct					
Reliability Collector					
Procedural Integrity Percentage					

Appendix E: Sample IOA form (treadmill)

Give a 1 for correct and 0 for incorrect						
	sample scoring	trial 1	trial 2	trial 3	trial 4	trial 5
1. Turns on device	1					
2. Wakes device by sliding bar	1					
3. Selects My Pics Talk app	1					
4. Selects "treadmill task"	1					
5. Hold device appropriately or sets in an appropriate place so video can be seen	1					
6. Selects Step 1	1					
7. Watches Step 1	1					
step 1: get the towel and cleaner	1					
9. Navigates to Step 2	1					
10. starts video	1					
11. Watches Step 2	1					
step 2: spray one side at least 4 times all the way down	0					
13. Navigates to Step 3	1					
14. starts video	1					
15. Watches Step 3	1					
step 3: wipe back corner	0					
17. wipe top	0					
18. wipe front corner	0					
19. Navigates to Step 4	1					
20. starts video	1					
21. Watches Step 4	1					
step 4: spray other side at least 4 times all the way down	1					
23. Navigates to Step 5	1					
24. starts video	1					
25. Watches Step 5	1					
	1					
step 5: wipe back corner	1					
27. wipe top	1					
28. wipefront corner	1					
29. Navigates to Step 6	1					
30. starts video	1					
31. Watches Step 6	1					
step 6: spray towel five times	1					
33. Navigates to Step 7	1					
34. starts video	1					
35. Watches Step 7	1					
step 7: wipe front and back of rail	0					
37. Navigates to Step 8	1					
38. starts video	1					
39. Watches Step 8	1					
step 8: spray towel five times	1					
41. Navigates to Step 9	1					
42. starts video	1					
43. Watches Step 9	1					
step 9: wipes front and back of rail	0					
45. Navigates to Step 10	0					
46. starts video	0					
47. Watches Step 10	1					
step 10: spray front rail and monitor	1					
49. Navigates to Step 11	1					
50. starts video	1					
51. Watches Step 11	1					
step 11: wipe front rail and monitor	0					
53. Navigates to Step 12	1					
54. starts video	1					
55. Watches Step 12	1					
12. Put the towel and cleaner away or go to the next treadmill	1					
Number of steps correct for navigation						
Number of steps correct in task						
Date						
Data Collector						

Appendix F: Participant Social Validity Questionnaire

Participant Social Validity Questionnaire

1. What did you like about using the iPad for learning new tasks?
2. What did you not like about using the iPad for learning new tasks?
3. How did watching the videos on the iPad help you?
4. Would you use the iPad to learn new tasks in the future? Why?
5. What would you change about using the iPad if you used it in the future?

Appendix G: Screenshot of Survey Monkey Social Validity Questionnaire

prompting

	Strongly agree	agree	neutral	disagree	strongly disagree	N/A or no opportunity to observe this
1. The vocational tasks the participant learned were important to their job	☐	☐	☐	☐	☐	☐
2. Questions regarding the research that I asked were answered in a prompt manner and to my satisfaction	☐	☐	☐	☐	☐	☐
3. The outcome to increase participants' ability to complete vocational tasks was significant to the participant.	☐	☐	☐	☐	☐	☐
4. The participant became more independent as a result of instruction.	☐	☐	☐	☐	☐	☐
5. I believe the participant is able to learn from video prompting.	☐	☐	☐	☐	☐	☐
6. The participant was able to use the iPad mostly independently	☐	☐	☐	☐	☐	☐
7. The iPad is socially appropriate to use for this population and age	☐	☐	☐	☐	☐	☐
8. The app used was appropriate to show video prompts for	☐	☐	☐	☐	☐	☐

vocational tasks on

9. Video prompting is appropriate for employment internships and employment if supervisors approve	☐	☐	☐	☐	☐	☐
10. I would be comfortable with helping a participant use the iPad with videos that are already created on it	☐	☐	☐	☐	☐	☐
11. I would be comfortable learning to add new videos to the iPad	☐	☐	☐	☐	☐	☐

Other (please specify)

2. What do you think are the positives of using video prompting

3. What do you think are the challenges or negatives of using video prompting in employment settings?

4. What type of consumer do you think video prompting is appropriate for?

5. As a job coach/developer/program manager do you have suggestions for improving

the video prompting for employment settings in the future

6. Do you have any other comments or information about the questions asked or do you have additional comments about video prompting that you would like to make? If so please write them now

Done