Efficacy of Video Prompting Using Mobile Technology to Teach Employment Tasks to Individuals with Intellectual Disability

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Abstract

Individuals with intellectual disability (ID) often experience a combination of intellectual and adaptive functioning deficits that negatively impact their ability to obtain and maintain competitive employment. Fortunately, research has shown that assistive technology, and particularly video prompting, helps supported employment for individuals with ID. This single case multiple- probe study investigated the efficacy of a highly customizable task analysis smartphone application in assisting three young adults with ID to complete common work-related office tasks. Findings indicate that all three participants demonstrated very large effect size gains in completing three unique office-related tasks once provided with the Task Analysis app.

Keywords: intellectual disability, assistive technology, employment, video prompting, mobile technology

Plain Language Summary

- Individuals with intellectual disability experience barriers that prevent them from getting and keeping jobs.
- Assistive technology can help to break down some of these barriers. Assistive technology is any item, piece of equipment, or product system that is used to increase, maintain, or improve functional capabilities of individuals with disabilities (Individuals with Disabilities Education Improvement Act, 2004).
- One kind of instruction that uses assistive technology is video prompting. People watch short video clips of a task so they have a model to show them how to complete the task. Video prompting helps people who struggle with following multi-step directions because they complete one step at a time in the correct order.
- We found that video prompting was helpful for young adults with intellectual disability in learning office-related tasks like creating folders, laminating, and mailing. We found that their ability to perform the steps increased greatly for the three employment tasks through video prompting.

Individuals with intellectual disability (ID) have historically experienced extremely high rates of unemployment. The National Core Indicators Adult Consumer Survey (Hiersteiner et al., 2018) reported that only 20.2% of individuals with ID hold a paid job in the community, and less than a quarter of those individuals receive benefits. Hiersteiner et al. (2018) noted that more common forms of employment opportunities for individuals with ID included jobs in segregated day programs and sheltered workshops, which pay very low wages. This is unfortunate, given the many financial and social benefits employment provides individuals with ID, including a higher perception of the quality of life (Simoes & Santos, 2016). Literature shows that employment also provides a greater sense of autonomy and mental well-being, while reducing levels of depression and anxiety (Modini et al., 2016; Randall et al., 2019).

Employment Barriers

Individuals with disabilities experience both individual (personal) and external barriers to employment (Hagner & Cooney, 2005). Internal barriers can include a lack of motivation, low self-confidence, inadequate work experience, and difficulties understanding unwritten workplace rules (Jahoda et al., 2008; Winn & Hay, 2009). In addition, individuals with ID often struggle to follow step-by-step directions, remember previously learned tasks, and transition from one task to another independently (Mechling & Ayres, 2012). External barriers include limited employment opportunities, a lack of appropriate supports in the workforce, negative employer attitudes, and workplace discrimination (Grant, 2008; Shier et al., 2009). To help overcome these barriers, federal legislation, including the Higher Education Opportunity Act (2008) and Workforce Innovation and Opportunity Act (2014) have provided an increased focus on improving employment outcomes for individuals with ID. To date, there have been a variety of supports that show promise at increasing employment outcomes for this population, including supported employment, job coaches, assistive technology, and prompting (Randall et al., 2019; Whittenburg et al., 2019).

Employment Support and Job Coaching

Since 1984, with the passage of the Developmental Disabilities Act, federal policy has encouraged supported employment and job coaching for individuals with ID (Developmental Disabilities Act, 1984; McInnes et al., 2016). Supported employment is an evidence-based practice that provides employment assistance to individuals with disabilities in real-world settings with competitive pay (Ellenkamp et al., 2016). Job coaching for individuals with ID often entails using strategies such as task analysis, prompting techniques, fading techniques, verbal instruction, and demonstration to teach specific employment skills (Gilson & Carter, 2016). Job coaches are assigned to provide on-the-job assistance to individuals with ID and fade support once individuals become proficient with the employment tasks (Bennett et al., 2010). However, the assistance offered by job coaches can be costly and stigmatizing, and their proximity can hinder social opportunities and independence (Collins et al., 2014; Gilson & Carter, 2016). A less obtrusive and more cost-effective alternative is the use of assistive technology (AT).

Assistive Technology

According to the Individuals with Disabilities Education Act, AT is defined as any item, piece of equipment, or product system that is used to increase, maintain, or improve functional capabilities of individuals with disabilities (Individuals with Disabilities Education Improvement Act, 2004). The use of AT aligns with 4.1c of the Think College Standards, which indicates that accommodations and technology needs should be addressed for students in inclusive post-secondary education programs (Grigal et al., 2012). Research indicates that AT can provide effective support that can either assist or replace the support frequently provided by job coaches (Ayres et al., 2013; Morash-MacNeil et al., 2018). Previously, AT for the workplace included instructions provided via a tape player (Walkman) or a Personal Digital Assistant (PDA; Sauer et al., 2010). In particular, mobile high-tech AT devices are desirable because they are portable, inexpensive, and frequently used among individuals without disabilities; consequently, they seem to be more socially acceptable (Bereznak et al., 2012). Smartphone technology is especially popular given that almost all (96%) young adults between the ages of 18–29 in the United States own one (Pew Research Center, 2019). Smartphones serve a variety of purposes, including communication, navigation, obtaining information, and scheduling. Additionally, mobile devices are becoming increasingly customizable (Stock et al., 2006). The customizable features in portable electronic devices have increasingly been used to assist individuals with ID in completing work-related tasks successfully by providing audio, video, and picture prompts (Collins et al., 2014). One instructional method frequently used with mobile high-tech AT devices to teach individuals with ID is video prompting (Bereznak et al., 2012).

Video Prompting

In video modeling, individuals watch a short video depicting a target skill and then imitate the entire skill, but in video prompting, individuals are shown a series of videos that depict a sequence of steps (Mechling & Seid, 2011). In between each step, the individual performs what they saw in the video. A task analysis is used in video prompting to break down skills into manageable steps, because for some individuals with ID, watching an entire skill being performed at once can hinder acquisition (Banda et al., 2011). Video prompting is desirable because it provides immediate feedback, uses repetition of instruction, and is cost-effective (Kellems et al., 2016; Mechling, 2005). This instructional strategy is powerful because through self-directed video prompting, individuals replay tasks independently, thereby removing some of the burdens on instructors to repeat important details (Ayres et al., 2013; Banda et al., 2011). Video prompting has been used successfully for individuals with ID across a variety of employment settings including a pet store, campus recreation center, a dental clinic, an animal shelter, a school cafeteria, and in office settings (Collins et al., 2014; Cullen et al., 2017; Douglas & Uphold, 2014; Randall et al., 2019; Van Laarhoven et al., 2009; Van Laarhoven et al., 2018).

Self-directed video prompting is a self-management strategy with the potential to provide individuals with ID a technique to manage their own vocational skills and technology-based supports (Cannella-Malone & Schaefer, 2015; Mechling, 2007). Self-instructional materials like pictorial task analysis, auditory prompts, and video models reduce the need for direct instruction by providing instructional support for completing multi-step tasks (Smith et al., 2015). AT promotes self-instruction because users can independently review the supports as often as needed (Ayres et al., 2013). Additionally, the use of self-directed video prompting aligns with the 4.2a of the Think College standards, which indicates that individuals in inclusive post-secondary programs should have opportunities to monitor their own progress (Grigal et al., 2012).

Advantages and Successes of Video Prompting. Video prompting can be used to remediate some of the challenges individuals with ID may face in the workplace (e.g., sequencing, recalling details). Videos provide a consistent model, are transportable across settings and staff, and have the potential to gain the attention of employees with ID who are reinforced by interaction with the video (Ayres et al., 2013; Bereznak et al., 2012; Mechling, 2005). Video prompting is also cost-effective because video clips can be recorded, shared between users (Ayres et al., 2013), and accessed on smartphones. Additionally, video prompting has a high level of consumer satisfaction and is often chosen as a preferred method of instruction among individuals with ID (Mechling & Seid, 2011).

Purpose

One way to improve employment outcomes for individuals with ID is to provide them with a means to self-manage their vocational skills (Cannella-Malone & Schaefer, 2015). Video prompting is an evidence-based practice for individuals with ID that has demonstrated the potential to assist with supporting their learning challenges in employment settings (Cannella-Malone et al., 2017). Despite the research demonstrating the efficacy of video prompting, there is a scarcity of literature investigating the effectiveness of mobile technology video prompting for performing vocational tasks. A recent review of portable technology to support individuals with ID identified only 3 studies that addressed vocational skills (Park et al., 2019). Thus, the purpose of this study is to extend the research base for AT by using a task analysis app to teach office-related tasks to three young adults with ID. To this end, the main research question was: What effect, if any, does the use of a video prompting app have on independent job completion rates for young adults with ID?

Method

Participants and Setting

The researchers used convenience sampling to select three young adults with ID enrolled in a four-year post-secondary education (PSE) program as participants in this study. As a Comprehensive Transition and Postsecondary Program, part of the PSE program's mission is to offer a collegiate experience that prepares young individuals with intellectual disabilities for employment. The program is located within a public university in the Southeast and provides an integrated course of study for 40 students with ID to enhance their independent living and employment skills. Selection criteria for the study required that participants (a) be enrolled in the PSE program, (b) have a diagnosis of mild or moderate or mild ID (IQ of 35–55 for moderate; IQ of 55–70 for mild), (c) be capable of operating smartphone devices and applications for daily use, and (d) consistently require assistance completing multiple step tasks.

Each student in the PSE program has a goal of obtaining competitive employment. The participant's academic instructor and the job coach employed by the PSE to work with the students during their required internship referred these students based on their skill deficits and difficulty completing multi-step tasks independently. The instructors, job coach, and researchers observed the participants using smartphone devices daily (e.g., texting, accessing Google calendar, making phone calls). Participants were able to access and navigate familiar iPhone applications independently. None of the participants had previously used the Task Analysis app or received training on the three employment tasks. Table 1 provides demographic information about the participants.

Travis

Travis was a 21-year-old male student in his second year in the PSE program. During the study, Travis had an internship in a local hotel. Travis preferred working in the kitchen helping with food preparation, but he also restocked guest rooms and cleaned outdoor recreation areas.

Bryce

Bryce was a 21-year-old male student in his second year in the PSE program. At the time of this writing, Bryce's work internship was in a local restaurant. Bryce helped with food preparation and dish washing.

Katherine

Katherine was a 25-year-old female student in her second year in the PSE program. Katherine worked as an office assistant at an off-campus apartment community that serves students of the public university for her work internship, and she also worked in the financial aid office. Her duties included taking packages to residents and maintaining the common areas. Katherine also interned for the PSE program at the university where she was responsible for shredding paperwork and cleaning the conference room. See Table 1 for participant information.

Procedures and Materials

The researchers used the TaskAnalysisLIFE mobile app (CU LIFE, 2020), which can be downloaded for free from the Apple Store, to create task analyses for three common office-related tasks: (1) preparing a folder with handouts, (2) laminating a document, and (3) preparing an envelope for mailing. The app can be used to present complex tasks in individual steps and provide optional picture, text, audio, and video support to help individuals complete each step. The app allows users to view steps individually or the task in its entirety.

Task 1 required participants to put together a folder with contents placed in a specific order to ensure a consistent product. Task 2 required participants to laminate a temporary parking pass. The third task required participants to prepare a flat-rate envelope for mailing. The researchers provided all materials necessary for participants to complete these tasks (e.g., folders, university handouts, university stickers, organizational trays, a laminator and transparent lamination sheets, a university parking pass, United States Postal Service flat-rate envelopes, and pre-printed mailing labels with fictitious addresses). These tasks were selected by the first researcher in consultation with the participants' job coach. The tasks were common office-related tasks with which the participants had no previous experience but were similar to tasks often completed in the PSE's internships and might be needed in future employment settings.

Each task required participants to complete 10 basic steps that were approximately equivalent in difficulty (see Table 2). Before the intervention, the researchers used the app to record a short video using the point-of-view (POV) perspective for each step of all three tasks. The POV perspective shows the arms and hands of the person completing a task, which eliminates distracting stimuli and focuses the participant's attention on the essential elements of the task (Mason et al., 2013). After recording the initial videos, the researchers piloted the videos with two other students in the PSE program familiar with the Task Analysis app but not the employment tasks used in this study. These students willingly completed the tasks using the Task Analysis app. Based on their feedback, the researchers revised four videos for clarity. See Table 2 for Task Analysis.

Participants operated an iPhone to use the TaskAnalysisLIFE app. When using the TaskAnalysisLIFE app, participants viewed a picture of the completed step and watched a video as the step was performed and described. Participants could replay any video as often as needed. The TaskAnalysisLIFE app click feature hid subsequent steps in the sequence until accessed by the participant.

Experimental Design

The researchers used a multiple- probe design to investigate the effects of using the TaskAnalysisLIFE app on the completion of the office-related tasks. Upon the university's Institutional Review Board's approval, the researchers conducted this study during the spring semester of 2020. The study included four components: baseline, training, intervention, and maintenance. However, the study ended abruptly before Bryce and Katherine entered the maintenance phase due to the closure of the university's campus in response to the COVID-19 pandemic. Each of these study components will be described in the section below.

Baseline

Baseline data collection for each participant consisted of a minimum of five probes to establish a stable pattern of performance (i.e., consistent trend without variability; Kazdin, 2011; Kratochwill et al., 2010). Participants entered the office at individually scheduled times. A researcher gave verbal instructions for each task from a prepared script, such as, "Pretend that you are working in an office. Your boss says, 'Please make a prospective student folder.' Here are all the materials. Use this list of contents to put together the prospective student folder." The researchers gave written lists of the steps required to accomplish every task to each participant. Researchers encouraged the participants to try their best to complete the tasks on their own, and researchers gave verbal praise for all attempts, even for unsuccessful ones, by the participant.

For all tasks, the criteria for discontinuing the task included if the participant: (a) did not initiate a step within 10 seconds, (b) did not complete a step within 30 seconds, or (c) indicated they had completed the task, even if they had not. For Task 2 (laminating a document) an additional criterion for discontinuation existed if the participant did something that could damage the equipment. If a participant met any of these criteria, the researcher ended that task and asked the participant to move on to the next task.

Training

Upon completion of their baseline phase, each participant received three individualized training sessions on how to use the TaskAnalysisLIFE app on an iPhone. The researchers used a researcher-made checklist of the features of the app to record participants' ability to use the app features independently. During the first training session, researchers introduced the app and modeled the app features. Then, researchers provided verbal and gestural prompts as each participant used the app to complete a 7-step unfamiliar task (i.e., building a structure). During the second training session, participants followed a 7-step sequence to build a model using the TaskAnalysisLIFE app with only verbal prompts from a researcher. Each participant completed two, 10-step tasks (i.e., sequencing items and putting pages in a notebook) with 100% accuracy without verbal prompts or assistance during the third training session. The total training time for each participant ranged from 31 to 51 minutes.

Intervention

After completing training on the app, participants were selected in random order to enter the intervention phase. However, after the first baseline data collection session, Travis, a student with Autism Spectrum Disorder (ASD), voiced his frustration at being unable to perform the tasks correctly. This became an ethical concern (see Harris et al., 2019), and the researchers decided to provide Travis with the app training first to alleviate further frustration.

During intervention, a researcher started every session by giving the participant verbal instructions for each task similar to baseline but with a reminder to use the TaskAnalysisLIFE app. After reading the script, the researcher handed the participant the iPhone with the TaskAnalysisLIFE app. If the participant performed a step incorrectly or asked for help, the researcher would tell the participant to replay the appropriate video. The researcher marked the step as incorrect and noted that the participant replayed the video on a data collection sheet. If the participant continued to perform the step incorrectly, the researcher provided assistance through a system of least prompts (i.e., gestural, verbal, hand-over-hand) and noted which type of assistance the participant required. At the end of each task the researcher praised the participant, regardless of performance. A maintenance phase was administered one week after the initial intervention phase for the first participant.

Data Recording and Analysis

Researchers recorded the number of steps each participant completed correctly and independently (i.e., without reminders to replay a video or prompts of how to complete the step) for every task and recorded if a participant replayed a video. A response was scored as correct if it was completed accurately and in the proper order necessary for the task to be accomplished. Consistency is important when producing a product, so the specified order of the steps for each task was required. After every session, researchers entered the number of correct steps for each task (from 0–10) in an Excel spreadsheet. The researchers converted the raw scores into percentages (0–100%) by dividing the number of correct steps by the total number of steps. The researchers then graphed the percentages, which served as the dependent variable in this study.

Researchers conducted visual analysis of the data points and calculated effect sizes (ES) between baseline and intervention. Visual analysis allows researchers to examine immediacy of effect and overlap, the consistency in the patterns of data points across phases, as well as changes in level, trend, and variability. Researchers followed the visual analysis guidelines outlined by Kratochwill et al. (2010).

To measure ES, researchers used an online calculator (Vannest et al., 2016) to compute Tau-U. Tau-U is a non-parametric approach that is calculated by integrating trend and overlap data (Parker et al., 2011). Advantages of Tau-U include its (a) strong statistical power, (b) suitability to short data series, (c) congruency with visual analysis, and (d) statistical control for trend in baseline data (Parker & Vannest, 2012). Tau-U effects are measured as *small* (0–0.2), *moderate* (0.20–0.60), *large* (0.60–0.80), and *very large* (0.80–1.00; Vannest & Ninci, 2015).

Interobserver Agreement (IOA) and Fidelity of Implementation

When calculating IOA, two researchers in the room each independently scored the participant using the researcher-created training and intervention checklists. Researchers coded 33% of all training, 28% of all baseline, 50% of all intervention, and 33% of all maintenance sessions to estimate the reliability of data collection. IOA was calculated with 100% reliability during training, with 99.5% reliability during the baseline phase, with 99.6% reliability during the intervention phase, and with 96.7% reliability during the maintenance phase.

The researchers calculated the fidelity of implementation for training, intervention, and maintenance during the same sessions in which they calculated IOA. During training, researchers used a checklist to ensure that all the TaskAnalysisLIFE app features (e.g., navigation arrows, scrolling, video play button) were described and that the participant navigated to each location (e.g., task page, step by step page, video page) within the app. During intervention and maintenance, researchers followed a script for every task to ensure consistency. The second researcher recorded whether the primary researcher provided the proper materials, introduced the details of the task, followed the prompt sequence, and transitioned the participant to the next task. Fidelity across sessions ranged from 98--100%.

Social Validity

At the conclusion of the study, participants completed a 9-item researcher-created social validity questionnaire. To avoid issues with readability, a researcher read the statements to participants and recorded their responses. Sessions were held virtually via Zoom meetings because researchers and participants were unable to meet face-to-face due to the University's COVID-19 restrictions. The questionnaire asked participants to rate the study's intervention techniques and their experiences using a Likert-type scale. The Likert-type statements used picture symbols ranging from a large frown (score of 1 = strongly disagree) to a large smile (score of 5 = strongly agree). Smiley face Likert scales are often used with adults with ID (Reynolds-Keefer et al., 2009), and are frequently used in health care due to their simplicity (e.g., Faces Pain Scale by the International Association for the Study of Pain, n.d.).

Results

Figure 1 graphically displays each participant's' percentage of steps successfully completed independently (i.e., without reminders or prompts) for all three tasks. During baseline, participants completed a mean of 11.2% (range of 0–20%) of the necessary steps for creating a folder, 0% of the steps for laminating, and 0.4% (range of 0–10%) of the steps required for mailing an envelope. Participants significantly improved their ability to perform all of the necessary steps independently upon the introduction of the TaskAnalysisLIFE app. During intervention, participants completed a mean of 95.6% (range of 80–100%) of the steps for creating a folder, 98.3% (range of 90–100%) of the steps for laminating, and 98.9% (range of 90–100%) of the steps for mailing an envelope. The pattern of data across phases was consistent for all participants as all participants reached a 100% success rate for all three tasks by the third day of intervention. Tau-U analysis showed very large (1.0) effect size gains for all participants across each task. See Figure 1.

Travis

A visual analysis of Travis's graphed data demonstrates a strong functional relationship between the independent and dependent variables. During baseline, Travis demonstrated a floor effect with 0% completion for all tasks. His performance increased substantially once provided with the AT, with a mean performance of 96.7%–100% across all tasks. Travis successfully used the TaskAnalysisLIFE app for self-instruction and did not require any prompts in how to navigate the app. His performance throughout the intervention was stable with no change for creating a prospective student folder and laminating a parking pass. His performance showed slight variability in the mailing an envelope, as he completed 9 out of 10 steps correctly on 2 of the 6 sessions during intervention. Analysis of effect size (ES) resulted in a very large 1.0 Tau-U gain, demonstrating that the TaskAnalysisLIFE app was highly effective in helping him complete the required steps for the tasks. During the maintenance phase, Travis completed two tasks (i.e., mailing an envelope, laminating) with 100% accuracy, and 96.7% accuracy for the task of creating a folder.

Bryce

A visual analysis of Bryce's graphed data also demonstrated a strong functional relationship between the independent and dependent variables. During the baseline phase, Bryce's data were stable with a flat trend in his performance and very little variability across tasks. His data also indicate a near floor effect as he only successfully completed two or fewer steps for each of the tasks, with a mean completion rate ranging from 0–20% across the three tasks. During the intervention phase, Bryce's mean performance increased to a mean range of 93.3%–100% for the tasks. Bryce successfully used the TaskAnalysisLIFE app for self-instruction and did not require any prompts on how to navigate the app. Analysis of ES resulted in a very large 1.0 Tau-U gain, demonstrating that the app was highly effective.

Katherine

A visual analysis of Katherine's graphed data demonstrated a strong functional relationship between the independent and dependent variables. During baseline, Katherine's data were stable with a flat trend and no variability across tasks. Her data also indicate a near floor effect ranging from 0–10% across the tasks. During the intervention phase, her mean performance increased to 95%–100% across the work tasks. Her performance throughout the intervention was stable with no change for the task of mailing an envelope. Her performance showed slight variability for the first two days of intervention when making a folder and laminating. However, by day three she consistently performed all tasks with 100% accuracy. Analysis of ES resulted in a very large 1.0 Tau-U gain, demonstrating that the app was highly effective for Katherine. Katherine was also successful in using the TaskAnalysisLIFE app for self-instruction. She only required one prompt during six intervention sessions to navigate the app.

Social Validity

The three participants all strongly agreed that the app was easy to use. All comments made about the app were positive (e.g., "The app helps me learn a new skill. I'm really loving the app."). The 9-item social validity questionnaire addressed the two uses of this app in the study (i.e., training and intervention). The mean scores for social validity measures related to training (M = 4.5) and the intervention (M = 4.67) were high, indicating a high level of satisfaction for using the TaskAnalysisLIFE app. All participants indicated a score of either 4 or 5 for all of the items on the questionnaire, except for one outlier in which Travis indicated a score of 1 for the item "I would like to use the TaskAnalysisLIFE app to learn new jobs." When asked why, Travis stated he did not care to learn any new jobs.

Discussion

The purpose of this study was to investigate the effectiveness of the TaskAnalysisLIFE app to assist individuals with ID to independently complete office-related employment tasks. Results demonstrated that participants significantly improved their ability to complete office-related tasks using video prompting and successfully implemented self-instruction using the app. An analysis of the errors indicates strategies for improving user performance.

Video Prompting is an Effective Support for Employment Tasks

Participants successfully completed novel, office-related employment tasks when using video prompting support with the TaskAnalysisLIFE app. Furthermore, the three participants expressed that they enjoyed using the app and would like to use it in other settings. These findings are consistent with previous studies that found that video prompting was an effective practice for individuals with ID (Bereznak et al., 2012; Randall et al., 2019) and that individuals with ID prefer to receive instruction through technology (Mechling & Seid, 2011; Shane & Albert, 2008).

TaskAnalysisLIFE App for Self-Instruction

Participants successfully used the TaskAnalysisLIFE app for self-instruction (i.e., independently located the required video clip, played and replayed the videos, navigated back to the list of steps for the task, and accessed the next step) after less than an hour of training. These results are also consistent with previous studies using self-directed video prompting (Cannella-Malone et al., 2013; Heider et al., 2019) and a task analysis app (Randall et al., 2019). Training individuals with ID to operate video prompts by themselves is likely to increase independent functioning (Banda et al., 2011), which is especially important in employment settings where resources are limited. When individuals can use technology for self-instruction, job coaches, teachers, and instructional aids can support more workers, which reduces the need for 1:1 job coaching (Heider et al., 2019) and decreases costs.

There are many factors that should be considered when using video prompting to support employees, that may have contributed to the participants' ability to independently navigate the TaskAnalysisLIFE app. First, the participants were all familiar with handheld technology because they used iPhones extensively in their daily lives. Knowledge of and previous experience with handheld technology should be considered when training individuals to use video prompting. Second, the TaskAnalysisLIFE app has a user-friendly layout. Different video modeling applications may require more training time depending upon the app's user interface.

Video Prompting Supports Individual Needs

While the video-based support was effective and desirable for the three participants, Travis's behaviors varied from those of Bryce and Katherine. While all participants had a diagnosis of mild or moderate ID, Travis had a comorbid diagnosis of ASD and did not like situations when expectations were unclear. During the baseline condition, Travis experienced extreme anxiety. For some individuals with ASD, the intolerance of uncertainty in unclear situations and events may lead them to interpret ambiguous information as threatening and to attempt to avoid such situations (Boulter et al., 2014). Travis's behaviors during intervention indicated that the video prompting intervention successfully addressed his anxiety in two ways. First, after learning to use the TaskAnalysisLIFE app to complete unknown tasks, Travis willingly and successfully performed the task, even commenting that he liked using the app. Second, during training, participants were shown how to check their work by replaying the videos. Results indicate that Travis replayed videos before attempting the step many more times (n = 22) than Bryce (n = 2) or Katherine (n = 0). Once Travis commented, "I want to watch that video one more time so I know which way to put it [the envelope]." Video prompting provided an additional benefit since he was able to access this support independently through self-instruction. Job coaches and teachers work with employees or students who exhibit needs in employment and learning settings. Video prompting is a strategy that can effectively support different learner needs.

Preventing and Correcting Errors

An analysis of the participants' data reveals three patterns of errors. First, participants required physical prompts to complete steps requiring fine motor skills (e.g., using a clip to attach a business card to a folder). This is not surprising, as individuals with ID may need assistance to perform fine motor skills to complete some vocational tasks (Ratzon et al., 2011). Therefore, teachers and job coaches may need to identify and pre-teach steps requiring fine motor skills to individuals with ID prior to the use of video prompting.

Second, some errors were made when participants missed essential details in the verbal directions and video clips. The cognitive demands (e.g., specific details) of the task may influence the results of individual participants (Mechling & Ayres, 2012). These types of errors were easily corrected when participants replayed the video prompt or when they were provided additional verbal details.

Finally, one participant made an error on a step requiring multiple actions (e.g., locating and selecting two different papers). Previous studies have shown individuals with ID may benefit when prompts are provided in small increments (Banda et al., 2011). To avoid these types of errors, multi-step directions need to be broken into separate steps in the task analysis.

Implications

The findings of this study are important for job coaches and teachers who provide employment support to individuals with ID. Video prompting on handheld technology can be used to overcome internal barriers (e.g., multi-step sequencing, remembering details) and external barriers (e.g., employment support, stigma of using supports). The TaskAnalysisLIFE app can increase the independence of individuals with ID while decreasing the training and support required to complete office-related tasks. Finally, practitioners should individualize the number and complexity of video prompts based on the individual needs of the user.

Limitations

There are several limitations to consider when interpreting the results of this study. First, the study was discontinued due to the COVID-19 pandemic. Therefore, maintenance data was only collected for one participant. Second, all participants in the study had met criteria for admission into the PSE program which included the ability to use technology independently. Therefore, the results of this study may not generalize to users who are less familiar with handheld technology. Third, the vocational tasks were completed in a campus office. Participants' performance may have varied in an actual employment setting.

Future Research

While video prompting is an evidence-based practice for individuals with ID, most studies evaluating video prompting interventions have focused on daily living skills. Limited studies have evaluated other skill categories (i.e., academic, employment, leisure; Park et al., 2019). Therefore, the authors recommend future research in these critical areas. This study extends the research supporting the use of a mobile TaskAnalysisLIFE app for completing office-related tasks. Future research should extend the findings to evaluate the feasibility of employees with ID to access hand-held technology in actual job placement settings. An examination should be made to determine the impact of video prompting on resources (e.g., training of tasks, individualized assistance) in employment settings. Finally, some individuals with ASD display anxiety and have difficulty performing tasks when they experience uncertainty. Additional research evaluating the effectiveness of video prompting to address the intolerance of uncertainty for individuals with ASD is recommended.

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Table 1

Participant Information

Name	Age	Race	Diagnosis	IQ and Measuring Instrument	Adaptive Behavior and Measuring Instrument
Travis	21	Caucasian	ID and ASD	59 Wechsler Adult Intelligence Scale - Fourth Edition	73 Vineland III Adaptive Behavior Scales
Katherine	25	Caucasian	ID	48 Wechsler Adult Intelligence Scale - Fourth Edition	71 Adaptive Behavior Composite
Bryce	21	Caucasian	ID	40 Stanford-Binet Intelligence Scales - Fifth Edition	86 Adaptive Behavior Assessment System - Second Edition

Note. ASD = autism spectrum disorder; ID = intellectual disability.

Table 2

Task Analysis of Office Tasks

Task	Sequence of steps
Preparing a folder for handouts	1. Get the orange folder and open it. 2. Get the student information page and the student questionnaire. 3. Put the two pages in the left-side pocket. 4. Get the Welcome to University paper and the open house invitation. 5. Put the paper and invitation in the right-side pocket. 6. Get a business card. 7. Clip it to the right-side pocket with the clip. 8. Carefully close the folder. 9. Get one Join Us sticker. 10. Put the sticker under the logo on the cover of the folder.
Laminating a document	1. Plug in laminator. 2. Turn on the laminator. 3. Get a lamination sheet and pull the top layer up. 4. Place the parking pass on the lamination sheet near the sealed edge. 5. Lay the top layer of the lamination sheet down on the parking pass. 6. Wait for the light on the laminator to turn green. 7. Gently push the sealed top side of the lamination sheet into the laminator and let go. Wait for the lamination sheet to pass all the way through the laminator. 8. When the lamination sheet stops moving through the laminator, carefully take the lamination sheet by grabbing it at the top by the parking pass. The bottom of the lamination sheet may be hot. 9. Hold the lamination sheet at the top by the parking pass and cut off the extra lamination. 10. Turn off the laminator
Preparing an envelope for mailing	1. Get the flat rate envelope. 2. Get the orange folder and place it on the desk with the tiger paw up. 3. Put the University sticker on top of the folder. 4. Put the parking pass on top of the sticker.

	5. Carefully slide the 3 items into the envelope so they stay stacked up. 6. Remove the white tape. 7. Fold the flap of the envelope down to seal the envelope. 8. Turn the envelope keeping the flap side up and find the word "To". 9. Get one mailing label and place it under the word "To". 10. Put the completed envelope in the outgoing mailbox.

Figure 1

Percent of steps completed correctly by Travis, Bryce, and Katherine