Using Video Prompting and Constant Time Delay to Teach an Internet Search Basic Skill to Students with Intellectual Disabilities

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Abstract: We evaluated a video prompting and a constant time delay procedure for teaching three primary school students with moderate intellectual disabilities to access the Internet and download pictures related to participation in a classroom History project. Video clips were used as an antecedent prompt and as an error correction technique within a constant time delay (CTD) procedure. Training, using a 29-step task analysis, was conducted in the students' special education classrooms. The prompting procedure was introduced in a multiple baseline across subjects design. Video prompting was effective in promoting rapid acquisition of the task for all three students. Following acquisition, observations suggested that the new skill was further generalized to another trainer, novel materials, and to another setting. In a final phase then, video prompting was removed and maintenance in the absence of video prompting was assessed at 1, 3, and 18 weeks. Performance decreased at the last follow-up session, but stabilized at 82.7–89.6% correct. These data suggest that video prompting may be an effective instructional strategy for teaching Internet skills to students with moderate intellectual disabilities.

Computer technology and use of the Internet have potential to broaden the lives and increase the independence of people with intellectual disabilities. Indeed, computer and an Internet connection are considered important tools for gaining greater independence and social integration (Kaye, 2000). Critical to this assumption is the understanding of how computer technology can support students with intellectual disabilities in accessing, managing, analysing, and sharing information. Access to information and communication technologies might offer these students limitless opportunities for knowledge acquisition and can promote individualized and lifelong learning (Howard, 2003).

A number of authors have shifted educators’ attention to the importance of curriculum and standard-based reform for students with disabilities (e.g., King-Sears, 2001; Wehmeyer, Latin, & Agran, 2001). A major topic concerning access to the general curriculum for students with intellectual disabilities involves the centrality of curriculum modifications to this effort. Much of the focus in curriculum modifications has been on the role of computer technology and Internet use in enabling students to access curriculum and participate in inclusive classroom settings (Wehmeyer et al.). For example, in the subject of History, a major goal in the Greek curriculum for fourth grade students is to become familiar with monuments of ancient Greek civilization. Inclusive practices that focus in the participation of a student with moderate intellectual disabilities could therefore include learning activities that aim to enhance the student’s skills in downloading and sharing pictures of monuments from the Internet. By sharing such pictures with their classroom peers, the student may be better enabled to contribute in classroom projects while at the...
same moment became familiar with the mon-
uments.

Nevertheless, according to Davies, Stock, and Wehmeyer (2001), access to the Internet is often restricted for students with intellectual disabilities for a variety of reasons, such as limited opportunities to use computers, lack of appropriate and cognitively accessible Internet-access software, and barriers to computer use associated with the complexity of operating systems literacy and writing requirements. Despite the fact that the utilization of a specialized web browser could, potentially, enhance independent Internet access for students with intellectual disabilities there are two major concerns regarding the use of such technology. First, there is limited availability of such technology and the development and widespread use that ensures usability, simplicity while enhancing at the same moment its capacity for more complex functions (i.e., send and receive e-mail) is challenging. Secondly, even in the case of the release of a specialized web browser there are still issues of generalization to be solved because a potential user with intellectual disability might experience problems in learning how to access the Internet across a range of contexts (e.g., in a friend’s computer or in a community based work setting) that provide only a common browser. After all, an important outcome for a student with intellectual disabilities when learning new behaviors or skills is to respond appropriately to the natural cues available in the environment (Dever, 1988).

In the past few years several innovative interventions have focused on developing new and more effective instructional procedures, such as video prompting, for teaching daily living skills or other adaptive behaviors to individuals with developmental disabilities, (e.g., Canella-Malone et al., 2006; Goodson, Sigafoos, O’Reilly, Cannella, & Lancioni, 2007; Norman, Collins, & Schuster, 2001; Sigafoos et al., 2005; Sigafoos et al., 2007).

Video prompting, an instructional technique of video technology differs comparing to video modeling in two distinct ways. Video prompting consists of showing each step of the task and then giving the participant an opportunity to perform that step before moving on to view the next step in the videotaped task analysis (Sigafoos et al., 2005). In con-

trast, video modeling consists of a single video presenting a model performing from beginning to end the target behavior or completing the designated task. That is, individuals in the former case have to watch only a relative brief video comparing to the longer duration video used in the latter case. Canella-Malone et al. (2006) considered this variable, that is, the partial task instruction with short video clips, as a plausible explanation for video prompting being more effective than video modeling for multi-step tasks and some individuals. Furthermore, video prompting differs from video modeling in terms of the viewpoint used in the video clips. Video prompting includes video clips that are filmed from the perspective of the performer completing the task, rather than the perspective of a spectator watching someone else completing the task, a common practice in video modeling.

Interestingly, in the research base that has emerged over last few years, video prompting has been used as an antecedent prompt to teach daily living skills, but also as an error correction procedure to promote skill acquisition (Goodson et al., 2007; Grice & Blampied, 1994; Tiong, Blampied, & Le Grice, 1992). Moreover, while some studies have shown that video prompting can be withdrawn following acquisition with no apparent detriment to participants’ performance (e.g., Shipley-Benamou, Lutzker & Taubman, 2002; Sigafoos et al., 2005), Sigafoos et al. (2007) demonstrated that in some cases performance deteriorates when video prompts are removed. That is, video prompting might not always facilitate participants’ independence and could instead create a condition of prompt dependency.

In an effort to promote greater independence and reduce prompt dependency, Sigafoos et al. (2007) demonstrated that video clips could be faded by gradually combining video clips of individual steps into larger and longer (multi-step) sequences. Towards this direction, other researches have combined video prompting with prompt fading procedures to teach daily living skills. For example, LeGrice and Blampied (1994) combined a constant time delay (CTD) procedure with video prompting to teach four participants with moderate disabilities to use a computer and a video recorder. Norman et al. (2001)
used video modelling and video prompting paired with a CTD procedure to teach three self-help skills to three elementary students with intellectual disabilities in a small group setting. Similarly, Graves, Collins, and Shuster (2005) showed the effectiveness of video prompting with CTD for teaching cooking skills to secondary students with moderate disabilities.

Nevertheless, to date, there appears to be no research using video prompting to teach Internet search basic skills to students with intellectual disabilities. Thus, the aim of the current study was to teach students with moderate intellectual disabilities to access a website on the Internet, downloading pictures in order to participate in their inclusive classrooms' History project, thereby fulfilling at the same time some of their IEP objectives. Specifically, the present study began to evaluate whether multi-step chunks of video clips plus an error correction procedure in which the merged video clips were used for two more times would be successful in teaching a novel task (i.e., an Internet search basic skill) to three students with moderate intellectual disabilities. Sigafos et al. (2007) showed that participants do not need to view each step individually to perform the skill to criterion. Results of this study showed that it is possible to reduce the number of separate video clips that are used as part of the prompting procedure instead of having to show each step separately making the training procedure less onerous for trainers, since sessions could be quicker with less inter-step disruption. Nevertheless, during the initial intervention phase none of the participants acquired the task with the help of this type of multi-step or chunked video prompting. Therefore, the procedure was modified in an effort to promote skill acquisition. We decided to use a step-by-step video prompting paired with CTD plus a similar error correction procedure as aforementioned in order to help students acquire the multi-step task. We hypothesized that unique characteristics of the three students with moderate intellectual disabilities necessitate the use of video prompting in order to make computer's interface more understandable.

Specifically, the research attempted to answer three questions: (a) Is video prompting effective in teaching Internet search basic skill to primary school students with moderate intellectual disabilities? (b) Will the skill be generalized to a novel trainer, setting, and materials? And (c) will the skill maintained over time?

Method

Participants

Participants in the study were three elementary students with moderate intellectual disabilities enrolled in special education classes of two elementary schools located in a small urban school district in Nafpaktos, Greece. Formal assessment that was held by a Greek state multidisciplinary team included the Greek standardization of the Wechsler Intelligence Scale for Children (WISC-III) (Georgas, Paraskevopoulos, Besevegis, & Giannitsas, 1997), the ATHENA Test for the Diagnosis of Learning Difficulties (Paraskevopoulos, Kalantzis-Azizi, & Giannitsas, 1999), and informal educational assessment measures (criterion tests, checklists, etc.).

Nikos, a 13-year-old sixth grader, was diagnosed as having moderate intellectual disability (full-scale IQ on WISC-III was 30). He was able to engage in conversations with peers and teachers, but had some difficulty articulating some words. He demonstrated no behavior problems and was very compliant to oral instructions. He was included in a general education class on a daily basis and attended a special education class where he received systematic instruction on his IEP objectives. His IEP objectives focus on teaching language skills (i.e., speech production, communication), math skills (computations, selecting money skills, and telling time to 5-minute intervals) and social skills. Regarding his participation in the inclusive class of History, the related IEP objectives were focused on recognition of heroic persons and description of important events (e.g., battles).

Angellica, a 12-year-old sixth grader with Down syndrome, was diagnosed as having moderate intellectual disability (full-scale IQ on WISC-III was 51). She had good expressive and receptive language skills. She spoke in complete sentences with no grammatical errors, but she had a small difficulty staying on
topic. Nevertheless, she could stay on task and follow directions. Angellica could read and write at a second grade level using capitalization and punctuation. She was included in a general education class on a daily basis and attended a special education class where she received systematic instruction on her IEP objectives. Regarding her participation in the inclusive class of History the related objectives were focused on recognition of heroic persons, description of important events (e.g., battles), definition and use of historical concepts (e.g., chronology, conflicts, cause and effect).

Konstantinos, a 12-year-old fifth grader, was diagnosed as having a moderate intellectual disability (full-scale IQ on WISC-III was 45) and a few difficulties in focusing and sustaining attention according to the interpretation of his performance on the WISC-III. He demonstrated infrequent, mild behavior problems, such as inappropriately displaying frustration and being noncompliant when asked to do something he did not want to do. Nevertheless, he had very good expressive and receptive communication skills and was able to engage in conversation with his peers and teachers. In addition, he had a reading age of 7 years old. Konstantinos was attending the special education class two hours every day, receiving individualized or small-group instruction while the rest of the day remained in his regular classroom. His IEP included mainly objectives focusing on social skills and functional academic skills (i.e., written expression, reading, computation, telling time, money skills). Regarding his participation in the inclusive class of History the related objectives were focused on recognition of historical monuments (e.g., ancient temples, theaters) and description of important events.

All of the students were considered promising candidates for participation to the study since they had the following prerequisite skills: (a) ability to wait 5 s for the video prompt, (b) visual and auditory acuity within normal limits, (c) ability to read words and phrases, (d) fine motor ability to perform typing (e) ability to imitate a video model, and (f) attendance to video clips for at least 5 min. In addition, they had a regular attendance in school. None of the participants had prior experience with video-based instruction.

Setting and Sessions

All sessions were carried out in the schools’ special education classrooms. The classrooms were equipped with a desktop computer. During each session, the special education teacher placed a portable computer (Hewlett Packard Pavilion dv 4000) on the desk next to the desktop computer. Data were collected five times each week during designated sessions that occurred as part of the participants’ daily educational program. Sessions lasted approximately 10–28 min. Participants received training individually from the special education teachers who regularly provided their instruction in order to avoid incidental modeling effects by watching one of the other participants receiving training.

Task and Materials

Intervention focused on teaching the participants accessing the Internet and downloading photos related to the classroom History project. Accessing the Internet was selected as the target activity because it was considered an important task for the three students regarding their participation in their schools’ innovative inclusive programs. Specifically, aiming to participate in their classrooms’ activities in subjects such as History students had to achieve independence in downloading pictures from the Internet as a contribution to their team project. This task was included in their IEPs as a parallel curriculum outcome among other appropriate, regarding conceptual difficulties, educational goals related to the certain subject (King-Sears, 2001).

The task analysis developed for this study is shown in Table 1. Initially, steps were merged in sets of 2 to 4 steps in order to produce 10 video chunks, but the aim was to combine these chunks into a single video clip in a subsequent phase of training. We thought it unlikely that the students would have learned if instruction had begun with the 1-chunk video clip for two reasons: First, searching the Internet is considered a complicated multi-step skill, so students would have to watch a long duration video showing the entire task, and in addition the three students had not been exposed to video prompting before. Therefore, we decided to include in each
merging video clips to the minimum number of video clips that represented a reasonable unit of subtasks. For example, regarding opening of Internet Explorer, Steps 4, 5 and 6 were merged in a single video clip. Subsequently, the merged steps of the task analysis were filmed using a digital video camera (Sony DCR-DVD106E). In addition, each step of the target task was filmed as an individual video clip for a step-by-step training approach in case students failed to respond correctly in the larger multi-step chunks of video.

Regarding the viewpoint of video clips, we filmed them from the performer’s perspective. That is, when students viewed a video clip, they saw a step being completed from the perspective of the performer completing the task, not from the perspective of a spectator watching someone else complete the step. Each clip lasted from 4 s (Step 3) to 29 s (Step 9) with a mean length of 10 s. In addition, to demonstrating the actions required for completing the step(s), each video clip also included a one-sentence voice-over instruction. For example, the video clip for Step 1 consisted of an over-the-shoulder shot of the performer’s hand pressing desktop computer’s power button. While doing this, the performer—who could be heard but not seen—said: First, press the computer power button. As another example, the video clip for Step 9 showed the performer’s index finger of his right hand moving towards and then pressing the Backspace button on the keyboard. The camera for this shot was positioned behind and slightly to the right of the performer so that when view-
ing this clip, the participant saw the index finger isolated—and part of the performer’s arm moving toward and pressing the Backspace button. As this occurred, a voice—over instructed the student to “Press the Back button.”

Of interest in the materials of the study was implementation of Microsoft PowerPoint™ presentation software to support instruction. Each video clip appeared in the middle of a slide allowing the special education teacher to deliver the presentation easily regarding the order of presentation and the correct use of delay intervals. The PowerPoint™ application was programmed to advance to the next slide “on a click.” On the 0-s delay interval, the video clip of the first step of the chained task immediately occurred, and, on the 5-s delay interval, the same video clip occurred following a 5-s delay. The video clip then stopped and the program advanced “on a click” to the next slide containing the video clip of the following step. In addition, in order to overcome foreign language difficulties concerning the typing of Google address (Step 10) we presented it across the PowerPoint slide above the clip in order to help students learn it as a sight word.

The set of video clips were shown to the participants on a portable Window XP-based Hewlett Packard Pavilion dv 4000 computer. The computer screen measured 20.5 × 33.5 cm.

Dependent Measure and Data Collection

The dependent variable for this study was the percentage of steps in downloading the pictures from the Internet task analysis (see Table 1) that were completed correctly. During baseline, training, generalization and follow up sessions the task analysis shown in Table 1 was used as a data sheet, in order to record whether each step of the task was completed independently or not on a session by-session basis. Student responses were recorded as either correct (+) or incorrect (−). For example, to be scored as correct, the first step (i.e., Press the power button of the computer) had to be completed independently within 30 s of the initial instruction (e.g., Nikos, download a picture from the Internet). All subsequent steps had to be completed within 30 s. A response was defined incorrectly whenever (a) a student performed the step incorrectly (topographical error), (b) a student didn’t perform the step in correct order (sequential error), (c) not completing the step within the allotted response interval, that is 30 s of the task direction or the previously completed step (duration error), (d) not initiating the response within 5 s of the task direction or the previously completed step.

During the second phase of intervention, the special education teacher used video prompting with a constant time delay (CTD) and a video prompting error correction procedure. Video prompting was delivered with a 0-s response interval, until students performed at 100% correct for two consecutive sessions. Subsequently, training sessions were delivered using video prompting with a 5-s delay interval. Students’ responses in CTD procedure were recorded in the following manner: (a) The special education teacher recorded a (+) in the “Before the prompt” column whenever students completed a step independently within 30 s of the task direction or previously completed step and in the “After the prompt” column when the students completed the step correctly within 30 s following the video prompt; (b) The special education teacher recorded a (−) in the “Before the prompt” column when students responded incorrectly within 30 s of the task direction or previously completed step and in the “After the prompt” column when the students responded incorrectly within 30 s following the video prompt. In addition, the special education teacher recorded a “T” for each topographical error, an “S” for each sequential error, a “D” for each duration error and a “NR” whenever a student failed to initiate a response within 5 s of the video prompt. Data were collected during sessions that were scheduled five times per week. At the end of each session, the participant was allowed to print the picture that has downloaded in the certain session.

Experimental Design

The study involved five phases: (a) Baseline, (b) Video chunking plus an error correction procedure, (c) Video prompting paired with CTD plus an error correction procedure, (d) Generalization and (e) Follow-up. To
demonstrate a functional relation between implementation of video instruction and increases in the percentage of steps completed correctly, the baseline, video chunking and video prompting phases were arranged according to a multiple baseline across subjects design (Kazdin, 1982).

Following baseline condition, we introduced video chunking plus an error correction procedure. Nevertheless, because all students failed to respond correctly during the second video chunk in three consecutive sessions, we then implemented the single step video prompting procedure using a CTD plus video prompting error correction procedure. Acquisition criterion was three successive sessions with 100% of the steps completed independently. Immediately following the training phase, generalization sessions were held, while follow-up sessions were conducted at 1, 3 and 18 weeks without using any video prompting in order to assess maintenance.

**Procedure**

**Baseline**

During baseline, data were collected for a minimum of three sessions or until data were stable as indicated by the students’ special education teachers. During each session, the special education teacher recorded each student’s responses. Students were brought to the special education classroom one at a time and sat in front of the desktop computer. Subsequently, the special education teacher said: [Name], can you download pictures from the Internet?, while simultaneously pointed to the computer. The teacher then waited 5 s for the student to initiate the first step of the task and 30 s for the student to complete it. If the student completed correctly the first step, the special education teacher marked a (+) on the data sheet and waited 5 s until the student initiate the next step of the task analysis. If the student responded incorrectly or made no response, the teacher stopped the student, recorded the error and completed the step correctly, and as unobtrusively as possible, so as to prevent the student from seeing the step being completed correctly. The teacher then stated again the task direction to the student in order to continue (i.e., “Download pictures from Internet”) and waited 5 s for the student to initiate and 30 s to complete the next step of the task analysis. The same procedure was followed with each step of the task analysis. Following completion of the session, participants were thanked for their participation, irrespective of their performance during the session.

**Video Chunking plus Error Correction Procedure**

During this phase, students were brought to the special education classroom individually during their daily sessions and positioned to sit in chair in front of a desktop computer. In addition a Hewlett Packard Pavilion dv 4000 portable computer was placed on the desk approximately 20 cm to the right of the desktop one, in order to make the screen easily visible to the student. Then, the teacher pointed to the portable computer screen and delivered an attentional cue: “Okay [name], watch this.” The teacher then played the first chunk of video showing Steps 1 to 3 of task analysis. When the video clip ended, the teacher said, “Okay, [name], now you do it” and gave him/her 30 s to complete the steps shown in that chunk of video. If the student failed to complete correctly the steps within 30 s, made an error or did not respond, the student was shown the relevant chunk of video a second time while the teacher pointed to the portable computer screen and said “Watch this.” When the video clip ended, the teacher said “Okay [name], now you do it.” At this point, the student was given 30 s to complete the set of steps that were included in that chunk of videotape. If this second viewing of the merged video clip failed to produce the correct responses, the teacher showed the video clip a third time before completing the steps correctly and as unobtrusively as possible. The session ended when the teacher played the final chunk of video following the same process. Despite the addition of video prompts to correct errors, students failed to respond correctly to any video chunk except the first one. The same procedure was repeated for three consecutive days with similar results, therefore, an instructional package of video prompting paired with CTD plus error correction procedure was introduced.
**Video Prompting with CTD plus Error Correction Procedure**

The physical arrangement in this phase was the same as in the initial video chunking condition. However, the procedure was different in one distinct way: First, instead of using chunks of videos the special education teacher played a video clip showing the first step of the task analysis, then played a video clip depicting the second step and the process was continued until all 29 separate video clips had been shown in sequence.

Specifically, during the initial 0-s delay sessions, the teacher started the video clip of the first step and asked the participant to “Watch this,” pointing to the computer screen. After viewing the video clip, the teacher said “Now you do it.” At this point, the participant was given 30 s to complete the step. During the 0-s delay sessions, students were verbally praised for their correct responses. If the participant failed to complete a step within 30 s, the teacher used the aforementioned error correction procedure. Error correction consisted of interrupting the student if he or she attempted to complete a step incorrectly and saying “Sorry [name] that is not quite right. Here watch this.” Subsequently, the video clip was shown a second time while the teacher pointed to the computer screen and said “Watch this.” When the video clip ended, the teacher said, “Okay, [name], now you do it.” At this point, the student was given another 30 s to complete the step. If this second viewing of the video clip failed to produce the correct response, the teacher showed for a third time the video clip before he completed the step correctly and as unobtrusively as possible so as to ensure that eventually the completion of the step from the student was due to the error correction procedure and not from seeing the step being completed correctly from the teacher. The session ended when the final video clip was shown and the participant either completed the step correctly (with or without error correction) or, failing this, the teacher completed the step as described above.

During 5-s delay sessions, the student had 5 s to initiate a step before the delivery of the video prompt. If a student initiated a step before the prompt within 5 s and completed the step correctly within 30 s he or she received a verbal praise. If the student failed to respond correctly before the prompt the teacher asked the student to wait for the video prompt. After the 5-s delay interval, the teacher showed the video clip and gave him 5 s to initiate and 30 s to complete the step following the video prompt. If the student performed an incorrect response after the prompt, the aforementioned error correction procedure was implemented until the student completed the step correctly. If the student required more than 30 s to complete the step, the teacher recorded in the data sheet a duration error.

**Generalization**

The special education teachers conducted three generalization sessions immediately after students met criterion (i.e., independently responded to 100% of steps) or managed a near errorless performance. To assess generalization across persons, another school-teacher delivered the verbal task direction (“Download pictures from Internet”) in the special education classroom. To assess generalization across settings and materials students were brought by the special education teachers to the schools’ computer laboratories in where students had to respond to the task direction (“Download pictures from Internet”) using different desktop and portable computers than the ones used during training. At the end of each session, students were socially reinforced for the completion of the task.

**Follow-up**

Follow-up sessions were conducted with Nikos, Angellica, and Konstantinos at 1, 3, and 18 weeks after the end of generalization phase in order to assess maintenance. The last follow-up session was planned to be held 10 weeks after the final session (i.e., in September immediately after summer holidays). Nevertheless, one of the students (i.e., Nikos) moved to another school and by the time we managed to arrange with his parents an appointment for the last follow-up session, he got the flu. Therefore, we waited for him to
recover before arranging the last follow-up session for the three students. The procedures in place during this final phase were identical to those of the baseline phase. Students were praised for their correct responses at the completion of the chained task.

*Inter-observer Agreement and Procedural Reliability*

Reliability data on the number of steps performed correctly was collected from the first author by watching videos for at least 42% of the sessions and across all phases of the study for each participant (range 42–57%). These sessions were videotaped with a digital video camera (Sony DCR-DVD106E). Agreement between the teacher and reliability observer on the steps performed independently was calculated on a session-by-session basis using the formula: Agreements/(Agreements + Disagreements) × 100%. The resulting percentages of agreement ranged from 90–100% with a mean of 96%.

Procedural reliability data were collected on 34% of all sessions regarding: (a) provision of attentional cues, (b) recording of students’ responses in the data sheet, (c) implementation of 0-s and 5-s delay intervals, (d) right use of video prompt as an error correction procedure, and (e) praising of correct responses. Special education teachers’ level of procedural fidelity was calculated by dividing the number of observed behaviors by the number of planned behaviors and multiplying by 100 for each variable (Brown & Snell, 2000). Results indicated 95% compliance with the designated procedure. Procedural errors consisted of teachers’ failing to deliver sometimes the attentional cues and the correct verbal praise. Interestingly, the use of PowerPoint™ presentation minimized procedural errors regarding implementation of 0-s and 5-s delay intervals.

*Results*

Figure 1 shows the percentage of steps completed independently by Nikos, Angellica, and Konstantinos for each session. During the initial baseline sessions, students completed 10.4% of the steps independently. Specifically, the three students were capable of pressing the computer power button (Step 1), pressing the monitor power button (Step 2), and placing their hand on the mouse (Step 3). However, they never moved the cursor with the mouse until it pointed to the Internet Explorer icon in order to access it, so they were never successful in downloading pictures from the Internet independently during baseline.

During the video chunking plus error correction procedure phase, students failed to show any increase in the number of steps been correctly completed. They only consistently completed the first three steps of the task analysis as in the baseline condition.

*Nikos*

When video prompting with CTD plus error correction procedure was introduced Nikos managed a nearly errorless performance (96.5%) in 16 sessions. During intervention, he made sequential and topographical errors (i.e., he mainly confused “Back” and “Enter” buttons). At the end of this phase Nikos consistently failed to type the Google address, despite the fact that we had incorporated it as a sight word above the video clip in the relevant PowerPoint slide. He generalized downloading pictures from the Internet across another person with 96.5% accuracy and across novel materials with 93.1–96.5% accuracy. During sessions that were held in the school’s computer classroom he failed to locate the monitor power button in one of the two different types of monitors (Step 2) and type the Google address (Step 10). This error seemed to arise because the “POWER” button was indistinguishable among other buttons unless the student could read the relevant label therefore, due to foreign language difficulties, all students failed to respond correctly to this step. During follow-up at 1, 3, and 18-weeks, Nikos continued to perform at 86.2–96.5% correct. In the final session, his consistent errors were failure to move the cursor with the mouse to the Explorer search box (Step 7), left click in the box at the end of the address (Step 8), type the Google address (Step 10) and press the “Enter” button (Step 11).

*Angellica*

When video prompting with CTD plus error correction procedure was introduced An-
Figure 1. Students' percentage of correct responses.
Angellica managed a nearly errorless performance (96.5%) in 18 sessions. At the end of this phase Angellica consistently failed to type the Google address. During generalization sessions, her percentage of steps completed independently ranged from 93.1 to 96.5%. She consistently failed to respond correctly in pressing the monitor power button (Step 2) and typing the Google address (Step 10). During follow-up, Angellica’s performance ranged from 82.7–93.1% correct. In the final session, she failed to move the cursor with the mouse to the Explorer search box, (Step 7), left click in the box at the end of the address (Step 8), type the Google address (Step 10), press the “Enter” button (Step 11) and press simultaneously “Shift” and “Alt” buttons (Step 15).

Konstantinos

When video prompting paired with CTD plus error correction procedure was introduced, Konstantinos showed an immediate increase in the percentage of steps performed correctly and met criterion of 100% for three sessions within 13 sessions. During generalization sessions, across a novel person, setting and materials, his percentage of steps completed independently ranged from 96.5% to 100%. Konstantinos, like other two participants, faced difficulty regarding Step 2 (press the monitor power button). During follow-up sessions at 1, 3, and 18-weeks, Konstantinos continued to perform at 89.6–96.5% correct. In the final session, he failed to move the cursor with the mouse to the Explorer search box (Step 7), type the Google address (Step 10), and press simultaneously “Shift” and “Alt” buttons (Step 15).

Discussion

In the present study, video prompting was used to teach students with intellectual disabilities to access the Internet in order to download pictures for a classroom History project. Results of the current study provide support for previous research using video prompting to teach participants with developmental disabilities (e.g., Canella-Malone et al., 2006; Graves et al., 2005; Norman et al., 2001, Sigafoos et al., 2005; Sigafoos et al., 2007). Our study extends the literature in that it appears to be the first to examine the use of video prompting to teach students with intellectual disabilities to independently access the Internet so as to increase participation in the classroom curriculum. Participants in previous studies were adults or high school students with developmental disabilities that learned to complete various daily living tasks. This is the first study that successfully employs video prompting for educational goals related to school subjects (i.e., History). Specifically, the students in this study acquired a skill that enabled them to fulfill part of their IEP goals. Therefore, video prompting appeared to be a facilitating and innovative way of assisting the development of students’ ability to access the Internet to acquire, manage, and share information, which in turn could be seen as a way of enhancing their access in the curriculum.

Nevertheless, while video prompting has been used with success to teach a variety of tasks, there is some conflicting evidence in the literature on whether or not video prompting facilitates independence versus leads to prompt dependency (Shipley-Benamou et al., 2002; Sigafoos et al., 2005; Sigafoos et al., 2007). In the current study, we prepared 10 chunks of video clips that collectively covered the 29 steps of the task analysis. Following baseline, video chunking plus error correction procedure was implemented, however it appeared ineffective in helping the three students acquire the Internet search skill. During this first phase of intervention, the students failed to respond correctly, despite the fact that each chunk of video was shown repeatedly. A plausible explanation for the unexpected results has been proposed by Cannella-Malone et al. (2006) according to whom videos with longer duration, such as those are used in video modeling, may be more demanding in terms of attentional and retentional processes. Indeed, although the merged video clips were shorter in duration than videos usually used in video modeling, the students in this study seemed to have difficulty in correctly imitate the behaviors being modeled, perhaps due to the fact that attentional demands increase when multiple behaviors are being modeled in a single video clip. For example, although the duration of the third chunk of video was not that long (i.e., 31 seconds) and students did seem to attend
closely to the merged video clip for its entire duration, they failed to complete correctly the steps included in the certain chunk. Another possible explanation, besides the underlying attentional problems, is the different nature of the Internet search skill being taught in this study compared to the daily living skills taught in previous studies. Setting a table, for example, could seem more familiar and hence less demanding than accessing information from the Internet. Therefore, a step-by-step approach may have been necessary to teach this more demanding skill.

Despite the students initial failure to learn the task with the video chunking plus error correction procedure, Nikos, Angellica, and Konstantinos did eventually learn to access and download pictures from the Internet rather quickly when an instructional package including video prompting paired with CTD plus error correction procedure was implemented. Indeed, each student showed large and immediate increases in the percentage of steps performed correctly as soon as the instructional package was introduced. Through use of video prompting, acquisition of the Internet skill was immediate and generalized to a novel setting and across another person. During the error correction procedure we did not use any verbal prompts or correction of errors with physical guidance in order to avoid a potential confound that is present in other studies (e.g., Norman et al., 2001). Instead, we repeated the showing of each video clip in order to demonstrate its effectiveness as an error correction technique. The most consistent error made by Nikos, Angellica, and Konstantinos concerned the incorrect typing of the Google address. This error seems understandable considering that Google uses English, which was a foreign language for these children. In contrast, they had no difficulty left clicking on “Pictures” or moving the cursor with the mouse to the box labelled “Search pictures” perhaps because these labels were written in Greek.

The levels of performance were maintained at a relatively high percentage correct when video prompting was no longer present. Specifically, independent performance was maintained at 82.7–96.5% correct during follow-up sessions. This high level of performance might be attributed to the use of the CTD procedure. CTD can be viewed as a nearly errorless learning procedure that systematically fades the initial or controlling prompt (i.e., video clip) to the natural discriminative stimulus.

In summary, the current study demonstrated the use of video prompting as an effective means for teaching basic Internet searching skills to students with moderate intellectual disabilities. Teaching this skill appeared to be a useful way to effectively engaging the students in participating in an important curriculum area. The interactive simulation of a video prompting procedure was selected as the intervention approach because it provides a comparable alternative for simulating the visual and auditory stimuli that are associated with use of the Internet environment and the response variations required of the learner.

References


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