Video Modeling and Prompting: A Comparison of Two Strategies for Teaching Cooking Skills to Students with Mild Intellectual Disabilities

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Abstract: Self-operated video prompting and video modeling was compared when used by three secondary students with mild intellectual disabilities as they completed novel recipes during cooking activities. Alternating between video systems, students completed twelve recipes within their classroom kitchen. An alternating treatment design with a follow-up and withdrawal probe was used to illustrate the effectiveness of both systems on each student’s independent task performance. Results indicated increased independence following video system use by all three students with video modeling more effective for two students and video prompting more effective for the third. Future directions for research are presented.

Students with mild intellectual disabilities are those who typically face a range of challenges related to learning, including difficulty generalizing and/or transferring information, inputting and retrieving information from memory, and short attention spans (Belmont, 1966; Dunn, 1973; Kirk, 1972; Spitz, 1973; Stephens, 1972; Thomas, 1996; Zeaman & House, 1963, 1979). Specifically, students with mild intellectual disabilities are characterized by “significantly subaverage intellectual functioning, existing concurrently with related limitations in two or more of the following applicable adaptive skill areas: communication, self-care, home living, social skills, community use, self direction, health and safety, functional academics, leisure, and work” (Polloway, Patton, Smith, & Buck, 1997, p. 298). However, despite the term “mild,” these students do not necessarily possess mild learning challenges (Luckasson et al., 2002; Polloway, 2004; 2005). They experience numerous learning challenges considerably impacting their functioning in current and potential future environments.

Students with mild intellectual disabilities once received a substantial focus in research and practice; however, in recent decades, attention to the educational issues of these students declined (Bouck, 2007; Edgar, 1987; Polloway, 2006). This lack of consideration extends to issues of curriculum and instruction where historically these students theoretically received a functional curriculum—a curriculum focused on life skills that enable adults to be successful in life, work, and participation in all facets of an inclusive community (Brown et al., 1979; Cronin, 1996; Patton, Polloway, & Smith, 2000). However, over the past few decades, researchers suggested a decrease on a functional or life skills approach in practice and research (Alwell & Cobb, 2009; Billingsley, 1997; Billingsley & Albertson, 1999; Nietupski, Hamre-Nietupski, Curtin, & Shrikanth, 1997), although without data as to the effectiveness of other curricula. For example, Bouck (2004a) reported a range of curricular approaches being used by teachers for secondary students with mild intellectual disabilities including a functional curriculum (19.0%), a special education curriculum (23.8%), a general education curriculum (15.3%), a lower grade level curriculum...
a unique curriculum (13.8%), no curriculum (4.8%), and a vocational curriculum (1.1%). Her results suggested limited attention to a functional curriculum for this population, akin to the critique by Patton et al. (2000) regarding the practice of educating students with mild intellectual disabilities (i.e., a watered-down general education curriculum lacking specialized instruction and concrete educational benefits).

Currently, the curricular focus for students with mild intellectual disabilities is believed to be mixed and variable, although educational policy within the last decade placed greater emphasis on students with mild intellectual disabilities receiving and succeeding in a general education curriculum (Bouck, 2007; Bouck, Bassette, Taber-Doughty, Flanagan, & Szwed, 2009; Patton et al., 2000). No Child Left Behind (NCLB, 2002) and the Individuals with Disabilities Education Act (IDEA, 2004) privilege students taking general large scale assessments, suggesting the curricular focus is a general education curriculum to the detriment of other approaches (i.e., functional) (Bouck, 2007). Patton et al. questioned the availability of specialized curriculum currently in schools for these students.

The lack of specialized curriculum for students with mild intellectual disabilities may be problematic given research suggesting the poor postschool outcomes typically experienced by this population. For example, students typically face lower rates of employment, independent living, and postsecondary school attendance (Blackorby & Wagner, 1996; Kaye, 1997; Newman, 2005; Newman, Wagner, Cameto, & Knokey, 2009). While typically not measured in the instruments assessing other outcomes, students with mild intellectual disabilities also face challenges related to daily living skills (Lynch & Beare, 1990). Thus, a need exists for elements of a functional curriculum for these students. Alwell and Cobb (2009) identified the lack of research attention on functional life skills was particularly apparent for students with high incidence disabilities (e.g., mild intellectual disabilities; Reschly, 2002) as well as research of high quality on the impact of life skills instruction.

Bouck and Flanagan (2010) note the limited current research on teaching functional life skills to students with mild intellectual disabilities. In a systematic review, the authors found seven articles published between 1994 and 2009 on teaching at least one student with a mild intellectual disability a functional curriculum or elements of a functional curriculum (i.e., functional academics, vocational education, community access, daily living, financial, independent living, transportation, social/relationships, and self-determination) (Patton, Cronin, & Jairrels, 1997). Of the seven, four focused, in part, on daily living skills with three of those related to food, nutrition, and/or cooking (Collins, Branson, & Hall, 1995; Kennedy, Itkonen, & Lindquist, 1994; Arnold-Reid, Schloss, & Alper, 1997) and one directed at safety (Collins & Stinson, 1995). Students improved in the targeted skills in each intended area; thus, the review by Bouck and Flanagan highlighted the minimal attention on aspects of functional living skills while simultaneously showing the effectiveness for skill acquisition using this approach.

**Strategies to Teach Functional Skills**

Strategies used to teach functional skills to students with mild intellectual disabilities since 1994 included time delay (Collins et al., 1995; Collins & Stinson, 1995; Kennedy et al., 1994), one-more-than concept for purchasing (Denny & Test, 1995), goal setting (Agran, Blanchard, Wehmeyer, & Hughes, 2002), and the system of least prompts (Arnold-Reid et al., 1997). Each resulted in overall increases in functional skill acquisition and generalization for students with mild intellectual disabilities. Although no study could be found focusing on functional skills training in which technology as an instructional tool was used, technology was used for teaching other skills to this population. Computerized instruction (e.g., computer assisted instruction, pentop computers) was successfully used to teach mathematics (Bouck et al., 2009; Fazio & Polsgrove, 1989), social skills (Margalit, 1995), fact retrieval skills (Edyburn, 1991), and word recognition skills (Lin, Podell, & Rein, 1991). Thus, the potential exists for students with mild intellectual disabilities to successfully use various forms of technology in acquiring and generalizing functional skills. Researchers have
however taught functional skills, using technology, to students with moderate and severe intellectual disabilities and autism spectrum disorders.

Various technologies are frequently used when teaching functional skills to students with moderate and severe intellectual disabilities and autism spectrum disorders. Recent investigations reported the effectiveness of computers (Lancioni, Dijkstra, O’Reilly, Groeneweg, & Van den Hof, 2000; Lancioni, Van den Hof, Boelens, Rocha, & Seedhouse, 1998; Lancioni, Van den Hof, Furniss, O’Reilly, & Cunha, 1999; Mechling, 2003; 2005; Mechling, Gast, & Langone, 2002), personal digital assistants (PDA) (Cihak, Kessler, & Alberto, 2007), MP3 players (Taber-Doughty, 2005), and iPods for delivering numerous forms of instruction incorporating technology in school and community settings (Taber-Doughty, Patton, & Brennan, 2008; Van Laarhoven, Johnson, Van Laarhoven-Meyers, Grider, & Grider, 2009; Van Laarhoven & Van Laarhoven-Meyers, 2006). All resulted in increases in skill acquisition, maintenance and/or generalization; thus, demonstrating the potential for the ongoing use of technology in instruction for these populations.

Two increasingly used strategies for teaching skills to students with autism spectrum disorder and moderate to severe intellectual disabilities incorporate video technology for instruction in the form of video prompting and video modeling. Video prompting combines visual and auditory prompts requiring students to view a single step of a video task sequence and complete that step before watching the next video clip of the subsequent step and performing that step (Cihak, Alberto, Taber-Doughty, & Gama, 2006; Krantz, MacDuff, Wadstrom, & McClannahan, 1991; Taber-Doughty et al., 2008). Video prompting was successfully used to teach individuals with disabilities vocational skills in an employment setting (Van Laarhoven et al. 2009), to use an ATM and debit machine (Cihak et al; Mechling, Gast, & Barthold, 2005), daily living skills (Cannella-Malone, Sigafoos, O’Reilly, de la Cruz, Edrisinha, & Lancioni, 2006; Van Laarhoven & Van Laarhoven-Meyers, 2006), grocery shopping skills (Hutcherson, Langone, Ayres, & Clees, 2004; Mechling et al., 2002), and cooking skills (Graves, Collins, Schuster, & Kleinert, 2005). Similar success was also found with video modeling in which students perform a task in the same or alternative setting without additional prompting only after viewing the entire task sequence (Cannella-Malone et al.; Taber-Doughty et al.). What may vary with video modeling, other than the task, is the delay between viewing the video model and the actual performance of the task. Reported delays between viewing videos and performing tasks range from immediately after viewing (Charlop-Christy & Daneshvar, 2003; Geiger, LeBlanc, Dillon, & Bates, 2010; Nikopoulos & Keenan, 2004) to at least an hour after viewing (Alberto, Cihak, & Gama, 2005; D’Ateno, Mangiapanello, & Taylor, 2003; Taber-Doughty et al.; Wert & Neisworth, 2003) when teaching students with autism spectrum disorder a variety of social, play and drawing skills, and numerous functional community skills (e.g., library skills, using an ATM) with students experiencing moderate and severe intellectual disabilities.

While ongoing evidence is reported about the effectiveness of both video prompting and modeling for teaching students with autism spectrum disorder and moderate to severe intellectual disabilities, no studies could be found in which these strategies were used for teaching skills to students with mild intellectual disabilities. At a time when video technology is increasingly accessible and uncomplicated while concurrently socially desirable by peers (Taber-Doughty et al. 2008), research should seek to examine whether this technology is appropriate for use with students who experience mild intellectual disabilities. In addition, the need exists to refocus research efforts in the area of functional skills training for students with mild intellectual disabilities (Bouck & Flanagan, in press). As such, the purpose of the present investigation was to compare the effectiveness of video prompts and video modeling when used to teach three middle school students with mild intellectual disabilities to acquire cooking skills when preparing a variety of simple recipes.
Participants

Three sixth grade students with mild intellectual disabilities served as participants for this study. Brittany, Rose, and Wes were nominated by their teacher for participation in the study based on the following: (a) willingness to participate, (b) level of cognitive functioning within the mild range of intellectual disabilities, (c) no sensory deficits, (d) limited, or no experience cooking, and (e) successful completion of a pre-training program. Two of the participants were Caucasian and one was African American and all participants spent approximately 80% of their time in a special education setting for students with mild intellectual disabilities and 20% of their time in general education, largely for elective courses (i.e., physical education). All participants spoke English as their first language. Intelligence, adaptive behavior ratings, and reading and math levels were obtained from the teacher. Table 1 provides a summary for each participant.

Brittany. Brittany was a 12 year-old sixth-grade female with a mild intellectual disability. Brittany had limited previous cooking experience at home and no previous cooking experience at school. Additionally, Brittany reported she did not have previous experience using an iPod. Despite her limited cooking experience, Brittany expressed interest in using an iPod to learn how to make new recipes.

Rose. Rose was a 13 year-old sixth-grade female with a mild intellectual disability. Rose reported she had limited previous cooking experience at home, and Rose’s special education teacher indicated she did not have previous cooking experience at school. Additionally, Rose reported she did not have previous experience using an iPod, but she did have experience using another brand of MP3 player and thought it was easy to use. Rose was also interested in learning how to cook and making new recipes using videos although she lacked prior experience with these types of activities.

Wes. Wes was a 12 year-old sixth-grade male with a mild intellectual disability. Wes reported his parents did not typically allow him to cook at home. Wes’ teacher indicated he did not have previous cooking experience at school. Wes also indicated he had no previous experience using an iPod, though he did state that he was good at “figuring out computers and a lot of stuff.” Similar to Brittany and Rose, Wes expressed an interest in using an iPod to learn how to cook.

Setting

All cooking activities took place in the participants’ special education classroom. Upon entering the classroom there was a small area (approximately one-fourth of the classroom) with three sinks, a counter, cooking appliances (i.e., toaster oven, toaster, blender, and microwave), and a refrigerator. Additionally, a round table with six chairs was present for

<table>
<thead>
<tr>
<th>Student</th>
<th>Chronological Age</th>
<th>Ethnicity</th>
<th>IQ</th>
<th>Adaptive Behavior</th>
<th>Reading</th>
<th>Math</th>
</tr>
</thead>
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<td>12</td>
<td>Caucasian</td>
<td>72\textsuperscript{a}</td>
<td>44\textsuperscript{b}</td>
<td>4.5\textsuperscript{th} grade\textsuperscript{d}</td>
<td>4.5\textsuperscript{th} grade\textsuperscript{d}</td>
</tr>
<tr>
<td>Rose</td>
<td>13</td>
<td>Caucasian</td>
<td>61\textsuperscript{a}</td>
<td>77\textsuperscript{e}</td>
<td>83\textsuperscript{e}</td>
<td>45\textsuperscript{e}</td>
</tr>
<tr>
<td>Wes</td>
<td>12</td>
<td>African American</td>
<td>63\textsuperscript{a}</td>
<td>88\textsuperscript{b}</td>
<td>87\textsuperscript{e}</td>
<td>70\textsuperscript{e}</td>
</tr>
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\textsuperscript{a} WISC-IV.  
\textsuperscript{b} GAC  
\textsuperscript{c} ABAS-II  
\textsuperscript{d} Test Scores unavailable; score given is a teacher estimate  
\textsuperscript{e} Woodcock-Johnson
students and teachers to eat. Next to the refrigerator, near the rear of the classroom, was a table with three computers for student use. On the other side of the table, also near the rear of the classroom, was a desk for the paraeducators. In the middle of the classroom was a large instructional area where sixteen student desks faced the front of the classroom. In the front of the classroom next to the teacher’s desk was an interactive electronic whiteboard students used to complete several academic activities (e.g., math worksheets, daily oral language, etc.).

Cooking activities took place in the morning between 8:30AM and 11:30AM. Depending on the class period, there were 12 to 15 additional students in the classroom. While participating students completed cooking tasks, other students in the class were engaged in mathematics or Language Arts. These activities were typically completed in a group setting with the teacher or paraeducator lecturing to students and allowing students to raise their hands and ask questions. Conversation amongst students and teachers occurred often while target students engaged in cooking activities.

**Materials**

**Recipes.** All recipes students followed were from the *Cooking to Learn* books functional curriculum from PCI Educational Publishing (Anderson, Coxson, Lamontagne, Buteyn, & Chapman, 2008; Anderson, Coxson, Britt, Haugen-McLane, & Mullins, 1999; Coxson & Anderson, 2001). Recipes were written at an independent level of reading, allowing students to read them without assistance. Recipes from the books were re-typed in Microsoft Word to allow for changes in the recipes (i.e., if a recipe called for an oven, but was changed to a toaster oven due to the supplies available) and for consistency in how recipes were worded (i.e., to read, “Put 1/2 cup of ____,” instead of variations on that step/wording such as “Add one half cup of ____”). Recipes were also retyped to eliminate the preprinted checklist of ingredients and supplies at the top of each page. Recipes were varied, but all required completing seven or more task steps using multiple foods and cooking supplies.

**Cooking supplies.** Cooking supplies were those typically available in a kitchen (e.g., a toaster oven, toaster, hot plate, and microwave). Other cooking supplies used included pans, a cookie sheet, measuring cups and spoons, cooking and eating utensils, and plates or bowls. Students were able to use these independently without instruction.

**Ingredients.** Recipe ingredients were purchased prior to baseline and intervention sessions. For each recipe, all ingredients were placed on the worktable for students to select from when completing steps of each recipe. Common ingredients used included a variety of fruits, milk, crackers, and biscuit dough.

**Videos.** Short videos ranging from one minute and fifty-seven seconds to six minutes and thirty-eight seconds were created using iMovie (Apple Inc., 2010) and demonstrated how to complete each recipe from start to finish. Each video also contained simple audio instructions in which task analysis steps were read prior to being demonstrated on the video. The third author physically and verbally modeled each step. All videos had similar pacing (i.e., how far apart each step was modeled) and view. For example, the video always showed the entire measuring cup being filled with an ingredient rather than just the specific line to which the cup was being measured; or, the video zoomed in when going to a temperature or time setting. All videos were filmed in the classroom where participants performed tasks and used the same equipment and ingredients to be used by students for completing recipes.

**iPods.** Three Apple 8-G iPod Nanos with color video capabilities were used in this study. The screen display was approximately one and one-fourth inches wide and two inches in height. Below the screen was the control wheel approximately one inch in diameter containing the word “menu” at the top, play/pause at the bottom, and rewind and fast forward on the left and right sides respectively. At the center of the wheel was a black select button pressed when making a selection from the screen. Students turned on the iPod by pressing and holding down any one of the buttons. In order to access videos, once the screen was lit, students pressed the menu button. Students moved their thumb around the control wheel until the word “vid-
"eos" was highlighted. Students then pressed the center select button. From the next list of items appearing on the screen, students used their thumb to scroll to the word “movies” and pressed the center button to confirm that selection. On the final screen, students scrolled down to the name of the correct recipe video and pressed the center select button. Once selected, they were able to press the play (or pause) button as needed. Students did not report any difficulty with being able to view the screen. During this study, all students navigated the iPods independently. Students watched videos and listened to the audio using earphones; two students preferred behind-the-ear headphones while one preferred ear buds.

Dependent and Independent Variables
Video modeling and video prompting in conjunction with a six level system of least prompts were two independent variables used to teach students to cook basic recipes. Pairs of recipes were matched based on number of steps, difficulty of completion, and similarity of tasks involved. Students completed 12 total recipes using video modeling or video prompting during the intervention condition. When using video modeling students watched the full video of the task to be completed five minutes prior to being asked to cook the recipe. When video prompting was used, students watched individual task steps while cooking and paused the video after each step.

When the system of least prompts was needed during video modeling and video prompting sessions, the following prompts were available: independent student performance (no prompt), verbal prompt, gesture, modeling, partial physical prompt, and full physical prompt. The dependent variable was the percent of task analysis steps for each recipe each student completed independently without prompting. The level of prompting needed for students to complete each step was also recorded.

Design and Data Collection
An alternating treatment design (ATD) with a baseline and maintenance condition was used to illustrate the effectiveness of the video modeling and video prompting systems for each student. This design was selected as it allowed investigators to rapidly compare the effects of both interventions to establish if one was more effective than another when determining independent task performance while concurrently demonstrating experimental control (Kennedy, 2005). A flip of a coin was used to determine the order in which prompting systems were used with no more than two consecutive administrations of a prompting system during intervention. The maintenance condition allowed investigators to confirm student performance levels achieved during intervention using the system that resulted in greater independence.

Each recipe was divided into discrete steps of a task analysis. Event recording was used to record the number of steps from each task analysis students were able to complete independently. Using each recipe step, a data sheet was created to allow researchers to record whether students completed each step independently or required a prompt and the level of prompt needed.

Experimental Procedures
Twenty-three different recipes were used in this study across conditions. Recipes were selected from the *Cooking to Learn* curriculum books (Coxson & Anderson, 2001) and were divided and grouped together into three categories based on their number of task analysis steps. Specifically, the three groups included recipes containing 6–8 steps, 9–11 steps, and 12 or more steps. Three recipes were included in the study from the first group, 15 recipes from the second group, and five recipes from the third.

Recipes were randomly selected during all phases of the study. Specifically, a total of 37 recipes were selected and divided into the three groups based on their number of steps (i.e., 6–8, 9–11, and 12 or more). Six (16%) recipes contained 6–8 steps, 20 (54%) contained 9–11 steps, and 11 (30%) contained 12 or more steps. During intervention sessions, recipes were randomly selected and paired based on task difficulty, similarities, and number of steps. Overall, 6 recipe pairs or 12 total recipes were used during intervention. Each recipe pair had a similar number of steps, type
of food, cooking supplies needed, and preparation steps.

Pretraining. Prior to data collection, students were introduced to the iPod Nanos and taught how to use the device to watch videos. A sample video illustrating a simple task was created. To ensure each student was able to successfully use the iPod prior to beginning the study, each watched the video and completed the tasks (i.e., raised their right hand as the model on the video did, drew a blue star, drew a pink circle, etc.). Each student was required to complete the tasks with 80% accuracy before beginning baseline.

Baseline. During this condition, students were given a paper copy of a recipe and instructed to make the assigned recipe. The students were observed while cooking and a member of the research team used the system of least prompts to correct the students, as needed. The percent of steps each student completed independently were recorded per session. Students continued in the baseline condition based on the order they were selected to begin the intervention. Brittany began intervention first while Rose and Wes continued baseline phase using traditional instruction. Rose began intervention second; Wes continued in the baseline phase using the traditional instruction and was the last student to begin the intervention. Students only began the intervention phase once baseline stability was established.

Intervention. This condition consisted of two treatments: video modeling and video prompting. Six pairs (12 recipes total) of matched recipes were used and each student completed one of the matched recipes using video modeling and the other recipe using video prompting. During video modeling sessions, students were individually presented with the iPod set to start on the selected video. Each was then instructed to watch the entire video at his/her desk. Once each student finished watching the video, he or she remained seated for 5 minutes (5-minute time delay) prior to beginning the cooking activity. At that time, students were asked to move to the cooking area. Once there, students were presented with a paper copy of the recipe and directed to begin cooking. Throughout each session, the system of least prompts was used when the student required assistance with a task step.

During video prompting sessions, each student immediately moved to the table in the kitchen area where he or she was given the iPod set to start at the selected video. Each was then instructed to pause the video after each step and complete that step before pressing, “Play,” to move on to the next step. Students were also instructed to rewind the video if a step needed to be viewed again before moving on to the next step. Finally, each student was provided a paper copy of the recipe. As during video modeling sessions, the system of least prompts was used to assist the students as they completed each cooking step.

Follow-up. Two separate probes over a two-week period were collected during this condition in which students completed two additional matched recipes. The first probe recorded the student’s level of independence as he or she continued to use his/her more effective intervention used during the previous condition. The second follow-up probe was conducted one week later where neither video system was used. The purpose of this final probe was to determine if student performance would return to baseline levels. As in baseline and intervention, the percent of steps completed independently by students were recorded and the system of least prompts was implemented as needed.

Interobserver Agreement and Treatment Integrity

Interobserver agreement data were collected by a trained second observer for each student across all three conditions. The second observer recorded whether the student completed steps independently or with prompts. Interobserver data were collected by the second observer at the same time as the first observer. The percent agreement for steps completed independently by students was calculated by dividing the number of agreements by the total of agreements plus disagreements and multiplying those by 100. For Rose, data were recorded during 33% of the baseline sessions, 58% of the intervention sessions, and 100% of the maintenance sessions. Agreement was 100% for baseline and maintenance and 97% for intervention. For Brittany, data were recorded during 60% of the baseline sessions, 50% of the intervention sessions, and 100% of the maintenance sessions. Agree-
ment was 100% for baseline and maintenance and was 96% for intervention. For Wes, data were recorded during 63% of baseline, 67% of intervention, and 100% of maintenance sessions. Agreement was 100% during baseline and maintenance and 95% during intervention.

A checklist was developed to assess treatment integrity during the intervention condition to ensure that the student began each session by meeting with the researcher(s), watching the appropriate video depending on the intervention they were receiving for a given session (this included having the students receive the time delay and prompts as needed), and completing the recipe. Treatment integrity was collected for 33% of the sessions for all three students and was 100% for all of the sessions for all three of the students.

Results

Figures 1, 2 and 3 demonstrate the number of steps each student was able to complete independently using video modeling or video prompting while engaged in cooking tasks. Visual analysis revealed all students increased the number of steps they completed independently when using video prompting and modeling over baseline levels. Visual analysis indicated Brittany’s level of independence was higher when using video prompting, while Rose and Wes cooked more independently when using video modeling.

Brittany. Figure 1 illustrates the percentage of steps Brittany completed independently while engaged in cooking tasks. She completed 58.5% of the steps independently during baseline 77.8% using video prompting and 74.3% independently using video modeling. The difference between the percentages of steps completed using the two independent variables was 3.5% with video prompting resulting in slightly greater independent performance. A nonparametric analysis (standardized mean difference effect size) was used to verify these intervention findings and confirmed the positive effect of video prompting over video modeling for Brittany ($d = 0.28$, $r = 0.14$). During the follow-up probe using video prompting, Brittany completed 100% of steps independently. When video prompting was then withdrawn, her level of cooking independence dropped to 90%.
Rose. Figure 2 illustrates the percentage of steps she completed independently while engaged in cooking tasks. Visual analysis indicates Rose completed tasks more independently when using video modeling. During baseline, she completed 52.0% of task analysis steps independently. However, this increased during intervention where she completed 78.5% of steps independently using video prompting and 87.0% using video modeling. To confirm visual analysis findings of intervention data, the standard mean difference effect size was calculated verifying video modeling was slightly more effective than video prompting for Rose ($d = 0.587$, $r = 0.28$). During the follow-up probe, Rose continued to increase her percentage of independent task performance by completing 91.0% of steps independently using video modeling. When this video system was withdrawn during the second probe her level of cooking independence increased to 100%.

Wes. Figure 3 illustrates the percentage of steps Wes completed independently while engaged in cooking tasks. Visual analysis indicates he completed more steps independently when using video modeling than when video prompting was used. During baseline, he completed 42.83% of task analysis steps independently. This increased to 65.3% when using video prompting and 77.5% when using video modeling was used during intervention sessions. The difference between the percentages of steps completed using the strategies (e.g., video modeling and video prompting) was 12.2%. To confirm these findings, a nonparametric analysis (standardized mean difference effect size) was conducted verifying that Wes completed tasks more independently when using video modeling ($d = 0.706$, $r = 0.33$). During the first follow-up probe using video modeling, Wes continued to increase his level of independent task performance by completing 91.0% of task analysis steps independently. However, when this was withdrawn, his level of cooking independence dropped to 73%.

Social Validity
Each student was informally interviewed prior to and following the study in order to determine whether they felt learning to cook was
important and if video modeling and prompting were effective strategies to use. In addition, their teacher was also interviewed to confirm the social validity of cooking skills and instructional procedures used by students. Students unanimously agreed that learning to cook was an important skill to learn and video prompting and modeling were strategies that made tasks “easier to do after seeing it.” Students also reported the availability of the written recipe in addition to the video prompts and models were important for successfully completing the cooking activities.

The teacher reported her students loved using the video iPod technology but was concerned about using it herself due to her own lack of knowledge on how to operate the equipment. However, she indicated her intent to incorporate the video strategies into her “cooking curriculum for next year.” Additionally, she noted the potential benefits of using video prompting and modeling for students who were visual learners and indicated these strategies might be beneficial for teaching her students in other functional skill areas.

Discussion

Ensuring all students with disabilities receive access to the general education curriculum is not only a legal but ethical obligation for all educators (Bechard, 2000; Hitchcock, Meyer, Rose, & Jackson, 2002). Special educators must also assure students will have access to a curriculum that facilitates future autonomous functioning in school, domestic, work, and other community settings (Clark, Field, Patton, Brolin, & Sitlington, 1994). As such, a clear need exists for education programs serving students with disabilities, including those with mild intellectual disabilities, to provide concurrent access to the general education curriculum and a functional curriculum in order to meet students’ academic and functional skill needs. The present investigation compared the effectiveness of video prompting and video modeling delivered via iPod Nanos when teaching functional cooking skills to students with mild intellectual disabilities. The results indicated each student was successful in using video prompting and video modeling for independently completing novel

Figure 3. Percentage of independent correct steps per session (Wes).
recipes and improving their accuracy over baseline levels.

Increased independence was evident for each student between baseline and intervention conditions. For students, baseline levels ranged from 42.8% to 58.5%. During intervention when video prompting was used, independent performance increased from 65.3% to 78.5%. However, a somewhat higher percentage was found for students when video modeling was used with percentages of independence ranging from 74.3% to 87%. While video modeling resulted in slightly greater task performance, upon closer examination of data, slight differences in student performance were measured between the two video instructional methods. For example, both Wes and Rose were able to complete cooking tasks more independently when using video modeling whereas Brittany’s performance was greater when using video prompting. Interestingly, while each student indicated their preferred video instructional system, only Rose performed better with her nonpreferred system, video modeling. Previous studies examining student’s preferred instructional methods indicate some correlation between preference and performance (Taber-Doughty, 2005; Taber-Doughty et al., 2008). However, this remains an area in need of further validation.

Two separate follow-up probes were conducted to determine students’ ongoing level of cooking independence. The first probe was conducted to confirm the effectiveness of the more effective intervention used during the previous condition. The second probe examined whether each student’s level of independence when cooking would return to baseline levels following withdrawal of the video system. All three students demonstrated a continued level of independence as observed during intervention when using their more effective video system. When those systems were removed during the follow-up probe, the level of independent functioning decreased slightly for both Brittany and Wes while Rose increased in her performance level. Thus, students either improved in their cooking skills or some carry-over effect existed as a result of the similarity to the previous recipe completed when using the video system. Future research may seek to expand this condition over more sessions to confirm the effects of the video systems on student performance. In addition, a more accurate measure of student learning might compare student performance on similar recipes (e.g., similar number of steps, type of food, equipment needed, and preparation steps) previously completed using a video system as well as novel recipes requiring only a few similarities.

While students in the present investigation demonstrated increased independence in cooking and following recipes when using video modeling or video prompting, only three students served as participants. Replication is needed to confirm these results when used by students who experience mild intellectual disabilities. In addition, further studies are needed to validate the use of video prompting and video modeling by students who experience high and low incidence disabilities. While there is a growing body of literature demonstrating the effectiveness of these video strategies with students who experience low incidence disabilities (e.g., Gihak et al., 2006; Van Laarhoven et al., 2009) and autism spectrum disorders (e.g., Charlop-Christy & Daneshvar, 2003; Charlop-Christy, Le, & Freeman, 2000), this research is still in its infancy. When used by students who experience mild intellectual disabilities, the present investigation may represent the first to involve this student population.

Although students in the current study were generally successful in using video prompting and modeling, one possible limitation to their immediate success and independence may be attributed to the equipment used to deliver the videos. While lightweight and portable, the iPod Nanos contained an extremely small viewing screen. Students may have experienced limitations while completing cooking activities due to an inability to see video details. As such, future studies may need to introduce similar forms of portable equipment yet with larger screens for delivering video models and prompts. Another potential limitation involves the teacher’s knowledge and comfort level with the technology being used to deliver the intervention. During the present study, the teacher expressed enthusiasm about using video prompts and modeling with her students yet was hesitant about using the iPads due to her own lack of knowledge in
how to program and operate the equipment. As such, future studies should examine how interventions are selected and used based on the teacher’s knowledge and comfort level. In addition, a second area of study might examine the amount of training a teacher receives in the use of technology and its subsequent use in the classroom.

More empirical studies are needed examining strategies for teaching functional skills to students who experience mild intellectual disabilities. While acquisition of functional skills leads to a greater likelihood for future independence and success in school, home and community settings (Browder et al., 2004; Brown et al., 1979), the declining curricular focus for students with mild intellectual disabilities may result in individuals who struggle to complete basic life skills (Bouck, 2004b). This study represents one recent attempt to address functional programming with students who experience mild intellectual disabilities while concurrently incorporating socially desirable technology during intervention. Future studies should examine how to integrate new technologies in addressing skills for students who continue to demonstrate a need for functional programming. Additionally, noted throughout this investigation were numerous positive comments from peers who indicated their desire to use the iPod Nanos to assist them in completing their work beyond the tasks targeted for intervention. Future studies may also examine the social validity associated with the various technologies used to deliver video prompts and models to students in an effort to find the most effective and those considered most socially valid.

Finally, investigators should examine whether or not the video systems are associated with the types of tasks targeted for intervention. For example, does video prompting or video modeling work better with discrete trial tasks or those less precise? Can they be used for tasks with less clear outcomes such as social interactions where appropriate responses may vary? Prospective studies might investigate whether a linkage exists between the video system used and type of task to be completed.

References


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Received: 29 September 2010
Initial Acceptance: 2 December 2010
Final Acceptance: 22 January 2011