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Video Modeling and Prompting in Practice: Teaching Cooking Skills

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Abstract

This article discusses the creation of video modeling (VM) and video prompting (VP) interventions for teaching novel multi-step tasks to individuals with disabilities. This article reviews factors to consider when selecting skills to teach, and students for whom VM/VP may be successful, as well as the difference between VM and VP and circumstances affecting which to choose. The purpose of this article is to provide practitioners with step-by-step instruction on how to teach cooking skills using VM and VP for young adults with disabilities.

Keywords

video modeling, video prompting, intellectual disability, cooking, evidence-based practice

Mariah is an 18-year-old high school student with an intellectual disability. She attends general education classes with her peers and receives specialized instruction for math and English. She also receives vocational skills instruction in a specialized career technical education course. Mariah would like to be independent and live on her own someday, although she currently receives assistance in completing most daily living tasks at home and school. Because Mariah has difficulty remembering how to perform some of the necessary tasks, she often waits for prompts from others to complete steps. For example, in warming a microwave meal, Mariah will initiate the first step, such as opening the microwave door, but may not independently complete the subsequent steps. Picture recipes help, but do not show all the actions necessary to complete the task. Vocalizing the instructions to herself has also helped, but Mariah still tends to forget. Mrs. Elliot, Mariah's special education teacher, is concerned about Mariah's prompt dependence and wants to use a teaching method that will help Mariah remember how to perform tasks independently. Mrs. Elliot recently read a research article about video prompting (VP), a procedure in which each step of a task is illustrated on video. She believes VP may help Mariah learn task sequences without requiring continuous prompting from an adult. "If Mariah can see all the actions involved in placing a meal in the microwave, setting the timer for heating, and pressing the start button," Mrs. Elliot told her team, "perhaps she will become more independent in completing a cooking task. If not, she can at least refer back to the video instead of seeking help from an adult. Seems like it's worth a try."

Independent living is a hallmark of being an adult. Independence can look different depending on each individual's current situation and ability level. Researchers (e.g., Cannella-Malone et al., 2011) have shown that individuals with disabilities frequently achieve less independence than they desire because they struggle with daily living skills. One critical aspect of living independently is the ability to cook to take care of one's nutritional needs (Humphries, Traci, & Seekins, 2008). The purpose of this article is to provide practitioners with step-by-step instruction on how to teach cooking skills using video modeling (VM) and VP for young adults with disabilities.

VM and VP as an Evidence-Based Practice (EBP)

The Individuals With Disabilities Education Act (IDEA; 2004), as aligned with The Every Student Succeeds Act (ESSA; 2015), requires state and local education agencies to ensure that students receive instruction through what ESSA referred to as scientifically based research, known

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commonly as EBP. VM is an EBP that utilizes current technology (National Autism Center, 2015) by demonstrating desired behaviors of a multi-step task in a video recording (Bellini & Akullian, 2007), then providing an opportunity for the student to imitate the model. VP is a form of VM that uses short video clips to teach selected skills and behaviors to students one step at a time (Cannella-Malone et al., 2011). Prior to initiating instructional VM or VP sessions, a model (preferably someone the student can relate to by age and/or gender) is filmed correctly performing the target skill/behavior. For VP, the video is then sequenced into the necessary steps as determined by a task analysis. The student is shown the video of the first step in the sequence, then prompted to complete the step. The student must successfully complete each step before progressing to subsequent steps in the sequence.

Various studies have demonstrated VM to be effective at teaching behaviors, such as incorporating technology as leisure (e.g., using an iPod; Hammond, Whatley, Ayres, & Gast, 2010), transitioning locations and activities appropriately (Cihak, Fahrenkrog, Ayres, & Smith, 2010), initiating social interaction (Bidwell & Rehfeldt, 2004), and performing tasks related to vocational training (Kellems & Morningstar, 2012). This method has also been used with academic learning, such as teaching math skills (Kellems & Edwards, 2016). Charlop-Christy, Le, and Freeman (2000) suggested that VP leads to faster acquisition of the target behavior than VM. Although VM was generally found to be effective in teaching tasks to participants, some studies found that not all participants were successful in acquiring specific skills in this way (Alexander, Ayres, Smith, Shepley, & Mataras, 2013; Cannella-Malone, Mizrachi, Sabielny, & Jimenez, 2013).

VP has been used to teach skills, such as cooking (Mechling, Ayres, Bryant & Foster, 2014; Sigafoos et al., 2005), cleaning (Kellems & Morningstar, 2012), and dressing (Rayner, 2011). Several studies have utilized small screens, such as iPods (Kellems & Morningstar, 2012; Rayner, 2011; Van Laarhoven, Johnson, Van Laarhoven-Myers, Grider, & Grider 2009) and handheld computers (Cihak, Kessler, & Alberto, 2008) as electronic prompting devices. Others have used larger screens, such as laptop computers and television sets (Graves, Collins, Schuster, & Kleinert, 2005). Regardless of the differences in tasks and materials, VP has been found to be effective in teaching independent living skills to individuals with disabilities (Bellini & Akullian, 2007).

Cooking Skills Taught Using VM and VP

VM and VP have been used for teaching individuals with disabilities how to perform food preparation activities, including the tasks of grating and slicing cheese, setting a timer, using cooking oil to coat a pan, trimming the ends of vegetables,

Table 1. Pre-Requisite Skills for VM and VP.

- | | |
|----|---|
| 1. | Able to see the video |
| 2. | Able to cognitively attend to the video |
| 3. | Able to imitate behaviors observed on the video |
| 4. | Able to match item from screen to actual item |
| 5. | Able to hear verbal cues |
| 6. | Able to understand video steps |
| 7. | Able to understand language used in video |

Note. VM = video modeling; VP = video prompting.

peeling a carrot, and using measuring cups (Mechling & Collins, 2012). Ayres and Cihak (2010) used computer-based VM to teach preparation of a simple meal, which included setting the table, warming a bowl of soup, and creating a sandwich. Considering various methods of food preparation, Graves et al. (2005) used VP to teach skills associated with a microwave (Mac n Minutes), stove (Ramen Noodles), and countertop (peanut butter and jelly sandwiches). Similarly, Sigafoos et al. (2007) used VP and fading to teach students tasks related to cooking, such as washing dishes. In addition, VM has also been used with handheld devices for instructing individuals on preparing meals, cleaning up, using recipes, and clocking in and out in a workplace setting (Van Laarhoven, Van Laarhoven-Myers, & Zurita, 2007), thus demonstrating the flexibility of VM/VP as teaching methods.

Appropriateness of VM and VP for Students and Tasks

VM and VP can be effective tools to teach various skills to individuals with intellectual and developmental disabilities (I/DD). Depending on the individual's skill and ability levels, VM and VP separately or combined may be appropriate. Refer to Table 1 for a complete list of pre-requisite skills required for students to benefit from VM and VP instruction. These skills include the ability to (a) pay attention to the video (both visually and cognitively), (b) imitate behaviors observed on the video, (c) match each item from the video to the actual item, and (d) hear the audio if there are verbal cues. In addition, effectiveness of instruction is enhanced if the student is able to work independently on the device (e.g., iPad) used to show the video model, including accessing (e.g., getting out and using) the equipment independently; adjusting the volume, rewinding the video, or replaying a certain scene or prompt; and reading if words are presented (Kellems & Edwards, 2016).

Selection of VM or VP for tasks. VM is more effective for shorter and simpler tasks, for skills that are more fluid and generally do not need to be broken down into small steps. VM can be used for individuals with moderate and severe disabilities. Whereas, VP should be used for longer and more complex tasks, for tasks with skills that are easier to

Table 2. Instructions for Creating Video Modeling/Prompting System.

Materials
Recording device: camcorder, digital camera, mobile device with camera
Video editing software: iMovie for Mac or Windows Movie Maker for PC
Video playback system: computer, DVD player, mobile device
Task analysis worksheet
Steps
1. Identify target tasks or skills to be learned
2. Task analyze the skill
3. Observe the student
4. Make the video
5. Edit the video
6. Deliver the video
7. Fade
8. Troubleshoot

master if they are broken down into a sequence of smaller steps so that the individual can successfully complete one step before being presented with the next (Kellems et al., 2015). The severity of the student's disability will be a factor in determining which form to use. Some tasks that seem simple to a person without a disability may be sufficiently complex for a person with a disability, and therefore, the video should be broken down into smaller steps.

Steps for Creating VM/Prompting Systems

Creating and using a VM/VP system may seem like a daunting task. However, with today's technology, practitioners probably have the skills and resources already, as outlined in Table 2. Materials needed for creating a VM/VP system include a recording device, video editing software, a video playback system, and a task analysis worksheet. Many smartphones come with a camera and software that practitioners can use to record, edit, and play back the videos. Devices such as iPads and tablets are also capable of accomplishing all three of these functions.

Step 1: Identify Target Tasks or Skills to Be Learned

Target tasks should be based on individual student needs identified by transition plans and Individualized Education Program (IEP) goals, as well as by input from students, parents, and employers. Targeted tasks can be functional, vocational, and social. *For example, Mariah and her team were concerned with developing independent living skills. Mariah had difficulty remembering multiple steps for cooking items in the microwave. Because there are so many*

foods that can be cooked in the microwave, her team decided to create a VP system for using the microwave to prepare a preferred item, a frozen macaroni dinner.

Step 2: Task Analyze the Skill

Conduct a task analysis. For improved accuracy, video record someone (e.g., a paraprofessional, student, or another teacher) completing the target task. Then, using the "task analysis worksheet" as found in Figure 1, list the action steps as identified in the video. Ask the teacher or parent to verify its accuracy and completeness. The task analysis worksheet will also be used for collecting data to document student skill acquisition. *Several steps are involved in microwaving a bowl of macaroni. Mariah's team hoped her enjoyment in eating this preferred item would help keep her motivated to learn the individual steps and quickly begin chunking them.*

Step 3: Observe the Student

Observe the student performing the task without any assistance or prompts. During the observation, note on the task analysis which steps the student struggles with or fails to complete correctly. This information will help determine which steps to emphasize in the video. *When told she could make some macaroni, Mariah went to the classroom freezer and removed a package of macaroni and retrieved a spoon from the drawer. She then proceeded to take the bowl of macaroni out of the box. At this point, Mariah looked to the staff to get help using the microwave. Her initial effort demonstrated that Mariah had a desire and willingness to complete this task independently. Observation and prompts showed that Mariah had learned some of the initial steps to completing this task. Thus, Mariah seemed to be a good candidate for using a VP system.*

Step 4: Make the Video

Table 2 outlines materials and steps for creating and using the VM/VP system. Create a video of someone performing each step of the task. The model might be the teacher, a co-worker, or the student himself or herself. The model should be as close as possible to the age and appearance of the student to ensure attention and motivation. Have the model emphasize or explain any steps or techniques that may cause difficulty for the student. For steps the student is already able to complete correctly, use a still image in the sequence instead of the video. *Since Mariah knew where to find the items she needed, the first five steps were prompted with pictures.*

Step 5: Edit the Video

Edit the video (see Table 2 for examples of editing software) into a sequence of brief clips, one clip showing each

Task: _____												
Student: _____						Observer: _____						
Key:			Correct +			Incorrect -						
			Date:									
Num.	Action Steps	Sec.										
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
			Raw									
			Percentage									
			Percentage = number correct divided by the total possible									

Figure 1. Task analysis worksheet.

step. Add text and/or voiceover instructions at the beginning of each step and a “stop” cue at the end. For steps that must be repeated a certain number of times or until a certain outcome is obtained, provide explicit instructions that state when the step is completed and when to move on to the next step. *Mariah’s team decided to group several steps from her tasks analysis (see Table 3) including “open door of the microwave,” “place macaroni inside,” and “close door without a pause.” Keying in the cook time was also made into a single step.*

Step 6: Deliver the Intervention

Once the video is formatted for the specific mobile device to be used (e.g., iPod, iPad, smartphone), load the video onto the device. Practitioners will want to show the student how to access the video on their device. Then, observe the student performing the task with the use of the intervention. The video should be edited or refined as needed.

Like most 18-year-old students, Mariah had her phone with her everywhere. The video system was installed on her device, with the file containing the VP system on her home screen. Mariah was guided to find it and watch it once with a staff member to see if she had any questions. Mariah

agreed that it would probably help her to make macaroni without the support of another person, and she was excited to try it.

Step 7: Fade

Reduce or fade the video. Although large segments of the general population watch videos on the Internet or television as they learn to perform tasks, the video is meant to be temporary and should lead to independent performance. It is important the instructor monitor student progress when implementing any intervention. The task analysis worksheet, which allows practitioners to easily monitor student progress, can be modified to accommodate tasks regardless of the number of steps. As the student’s performance of targeted tasks improves, edit out steps and fade use of VM and VP to promote maximum independence. As the fading takes places, the instructor’s periodic observations of the student’s performance without VM may show that the learner has not completely mastered the task or the entire sequence of tasks. Sigafos et al. (2007) suggested adding what they have called *video chunking*, which merges separate video clips of single steps to form multi-step videos.

Table 3. Mariah's Task Analysis.

Task analysis worksheet: Frozen dinner		
No.	Action steps	Seconds
1	Get out macaroni	14
2	knife	7
3	spoon	7
4	hot pad	11
5	Take bowl of macaroni out of box	18
6	Cut top with knife	28
7	Open door of the microwave	15
8	Place macaroni inside	19
9	Close door	13
10	Push buttons: 2, 0, 0	21
11	Push start button	8
12	Wait	120
13	Using hot pad take out of microwave	60
14	Pull back cover	28
15	Stir with spoon	96
16	Replace cover	24
17	Open door of the microwave	15
18	Place macaroni inside	19
19	Close door	13
20	Push buttons: 2, 0, 0	21
21	Push start button	8
22	Wait	120
23	Push timer button	11
24	Push buttons: 2, 0, 0	21
25	Push start button	8
26	Wait	120
27	Take out of microwave	44
28	Take off cover and throw it away	20
29	Stir with spoon	30

For example, if Mariah had learned separate steps using VP, but struggled to perform multiple steps independently, Mrs. Elliot might re-record or edit the first three steps of the microwave task together to produce a multi-step video. Mariah could then refer to a video showing a sequence of steps rather than one step at a time. The microwave task with video chunking might show steps 1–3, 4–6, 7–10, and so on. If Mariah were to master the “chunked” steps, but still struggle to perform the entire task independently, Mrs. Elliot could create a video model of the entire task. Thus, Mariah would be required to perform increasingly larger sequences of steps on her own, eventually without the aid of video.

Step 8: Troubleshoot

After VM or VP, performance of the target tasks may not always improve or in some cases not improve as much as desired. In these situations, it will be necessary to troubleshoot. During the troubleshooting process, the practitioner

will need to explore why the intervention is not working and clarify it to address the problems. Once the intervention is modified, it should be implemented again to see whether performance has increased. Troubleshooting should be an ongoing process and its necessity can vary by individual. One common problem is that the individual may not be learning a specific discrete step.

For example, if the collected data indicated that Mariah had mastered all of the steps in the video except those requiring her to push buttons on the microwave, Mrs. Elliot would want to review the video and make sure those steps involving pushing the buttons are detailed and explicit enough. Mrs. Elliot may notice that the video shows the model lightly touching the button, but does not explicitly state that the button must be pressed firmly. Mrs. Elliot then refilmed that discrete step and made sure that it explicitly showed how to push the button firmly.

Conclusion

The increasing availability of technology in transition-focused settings is an exciting opportunity for both practitioners and students to apply EBP to new contexts and skills. Because many of these devices are portable and relatively inexpensive, they lend themselves well to VM and VP in a variety of settings (e.g., kitchens). Using VM and VP to teach cooking-related skills is a natural melding of technology and EBP. This intervention is easily adaptable and can be used to deliver virtually any cooking-related instruction based on the students' ability level.

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