Comparing the Efficacy of Video Modeling to In Vivo Modeling for Teaching Vocational Skills to Adolescents Diagnosed with Autism Spectrum Disorder

By

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VIDEO MODELING COMPARED TO IN VIVO MODELING

Comparing the Efficacy of Video Modeling to In Vivo Modeling for Teaching Vocational Skills to Adolescents Diagnosed with Autism Spectrum Disorder

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Abstract

The purpose of this study was to compare the effects of video modeling to the effects of in vivo modeling for teaching new vocational skills to teenagers with Autism Spectrum Disorder (ASD). Error corrective procedures, a video clip presentation of the step correctly modeled or an in vivo model of the step, were used in each condition. Four teenagers diagnosed with Autism Spectrum Disorder were taught two types of vocational skills and within each skill were taught two variations of the skill, for a total of four different vocational tasks. Each participant learned one variation of a vocational skill through video modeling and the other variation through in vivo modeling. The study demonstrated that learning occurred in both conditions, video modeling and in vivo modeling, and both conditions resulted in mastery of all four skills for three out of four participants, and the mastery of three out of four skills for one participant.

DESCRIPTORS: autism spectrum disorder, video modeling, in vivo modeling, video prompting, in vivo prompting, vocational skills
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Comparing the Efficacy of Video Modeling to In Vivo Modeling for Teaching Vocational Skills to Adolescents Diagnosed with Autism Spectrum Disorder

The objective of the study was to compare the efficacy of video modeling to in vivo (live) modeling for teaching vocational skills to teenagers diagnosed with Autism Spectrum Disorder (ASD). To provide adolescents with ASD with the same post-school opportunities as their typically developing peers, there is a need for adolescents with ASD to be taught vocational skills. Unfortunately, few studies have examined efforts to teach vocational skills to teenagers with ASD. Therefore, it is important to determine effective and practical strategies for achieving skill acquisition of vocational programming for teens with ASD. The research conducted in this study intends to contribute to scientific literature by measuring the acquisition rates of vocational skills taught by video and in vivo modeling, in order to determine which, if either, approach is more effective in achieving independent task completion of these skills to teens with ASD.

Learning vocational skills in traditional educational settings typically begins in middle school. The acquisition and mastery of these skills may determine one’s ability to become gainfully employed. Therefore, effective training is critical. Adolescents with ASD must be given this same opportunity as their typically developing peers to be taught vocational skills. In accordance with the Individuals with Disabilities Education Act (IDEA), transitional programming is required to be included in Individual Education Plans (IEP) for all children over the age of 16, or younger if determined appropriate by
the IEP team (IDEA-Building the Legacy of IDEA, 2004). In addition to this federal law, individual state law may require transitional programing to begin at a younger age than 16. According to Disability Rights Ohio (2005), schools must begin transitional planning at the age of 14, or younger if deemed appropriate. Transitional planning is intended to prepare the student for many aspects of future adult life, including employment (Transitional Planning for Students with Disabilities, 2005).

Teaching any new skill to individuals with ASD typically requires the implementation of observational learning procedures through a presentation package that includes visual cues such as modeling and prompting. The use of these visuals cues are routinely specified in children’s IEP’s as a means of delivering educational materials. Modeling and prompting as can be demonstrated in vivo or through video. Research has shown both in vivo modeling and video modeling can be effective not only in teaching new behaviors to children with autism but also in promoting generalization and maintenance of these behaviors (Charlop-Christy and colleagues, 2000). Often times, total task completion is achieved through constructing a task analysis, breaking a skill down into small and manageable units, teaching steps one at a time. Before a skill can be mastered, many, if not all, of the individual components of a skill will require multiple presentations, prompting, and repetitions. Each mastered step can then be gradually linked together by a process called “chaining”, (Cooper, Heron, & Heward, 2007 pp. 436-437) gradually building to total task completion.
Compared to in vivo modeling, video modeling offers learners the ability to view the same material modeled exactly the same way, multiple times and as often as necessary, across settings and instructors (Hammond and colleagues, 2010). Video modeling provides consumers with a variety of mediums for viewing the material (e.g., television, computers, smart boards, electronic tablets, smart phones, etc.). This variety provides both the teacher and student an array of viewing options. For example, in the school setting, a video model for dish washing can be presented during classroom instruction, the teacher may then email the same video to a parent who can replay the video model for the student at home, the same video can then even be pulled up on a portable device and shown if needed for prompting while the student is attempting to complete the task, and can be shown almost anywhere at any time. Video modeling is also unique in its ability to provide the viewer with a restricted field of focus and does not impose demands on social attention or interaction (Corbett & Abdulla, 2005).

For this study, video modeling via the iPad was chosen in this study for multiple reasons. These portable tablets were identified by the teachers at the local University’s Autism Center, as being highly preferred in comparison to other means of educational video viewing used at the center. Murdock, Ganz, and Crittendon, (2013) list electronic tablets and iPads advantageous over traditional educational materials (e.g., paper and pencil, dry erase boards, direct teacher instruction, etc.) for several reasons to include the reinforcement value to children. Through the use of sound and imagery, the iPad typically provides immediate reinforcement for the user’s operating behavior. Learning
applications available for the iPad range widely and include everything from academic skills to social skills to daily living skills. As iPads in education are becoming more common, additional research on its efficacy is warranted, which is another goal of this current project.

Research suggests video modeling is an effective tool for teaching a variety of skills to individuals diagnosed with autism (e.g., Allen, Wallace, & Renes, 2010; Charlop-Christy, Le, & Freeman, 2000; Laarhoven, Kraus, Karpman, Nizzi, & Valentino 2010), however, there is little empirical research comparing its effectiveness to a live model. In addition, no studies published to date have compared in vivo to video modeling for vocational skill acquisition for teenagers diagnosed with autism spectrum disorder.

Charlop-Christy and colleagues (2000) compared video modeling with in vivo modeling for teaching language, social, play, and self-help skills to children with autism. The design used in this study was a multiple baseline design across children and within each child across two modeling conditions and within each modeling condition across the two tasks used. Essentially, each child was assigned a target behavior (e.g., expressive labeling of emotions) and within each target behavior was taught two variations of the behavior (e.g., happy versus sad; tired versus afraid), one variation via video modeling and the other variation via in vivo modeling. The results of this study found video modeling led to quicker acquisition of skills than in vivo modeling. In addition, generalization occurred in children’s behaviors after video modeling presentations, but did not generalize after in vivo presentations.
Laarhoven, Kraus, and colleagues (2010) compared picture prompting to video prompting to teach daily living skills to individuals with autism. Researchers noted much of the research previously conducted on video based instruction had focused on video modeling. “Video modeling” here refers to an instructional approach where learners view an entire video sequence of a task before engaging in the skill. “Video prompting”; however, is an instructional approach where each step in a task sequence is shown and immediately following each step, the learner engages in the particular step. Essentially, modeling consists of the “total task presentation”, verses prompting each step one at a time, or “chaining”, performed by a model. A within-subject adapted alternating treatments design was used in Laarhoven and colleagues 2010. Participant one was taught to fold clothes using picture prompts and to make pasta using video prompts. Participant two was taught to fold clothes using video prompts and to make pasta using picture prompts. Results from this study showed both instructional procedures were effective in increasing independent responding and/or decreasing external prompts and prompts to use technology during instruction for both participants. But video prompting appeared to be slightly more effective than picture prompting across most dependent measures. In this study, a laptop computer was used for the video prompting condition; however, practitioners involved in the study expressed that more portable systems may be needed to make the presentations of video prompts more feasible in vocational or community settings. Laarhoven and colleagues also state there is very little research available (at the time of this study) regarding the use of portable
Allen and colleagues (2010) examined the effects of video modeling to teach what they considered vocational skills to adolescents and young adults with autism spectrum disorders. Participants were taught to wear and walk around in a mascot costume and entertain customers in a retail setting. The video used for training modeled the mascot engaging in targeted behaviors in both contrived and naturalistic environments and from both the point of view of someone inside the costume as well as from someone outside the costume. A multiple-baseline design across participants was used to evaluate the data and showed near zero levels of performing target behaviors during baseline and an increase in multiple target skills after introduction of the video modeling procedure. There was no comparison to modeling with a live model.

Overall, video modeling appears to be a promising instructional strategy for teaching a variety of behaviors to individuals with autism and related developmental disabilities (Allen, Wallace, Renes, Bowen, & Burke, 2010; Corbett 2003; Corbett & Abdullah, 2005; Delano, 2007; Hammond, Whatley, Ayres, & Gast, 2010; Rayner, Denholm, & Sigafoos, 2009), but few studies have compared its effectiveness to that of a live model (Charlop-Christy, Le, & Freeman, 2000; Gena, Couloura, & Kymissis, 2005). In addition, no known published studies to date have examined comparing a video to a live model when used as an instructional approach for vocational skills, within the ASD population.
This study compared the effects of video modeling to in vivo modeling for vocational skill acquisition in adolescents with ASD. The results of this study could help to establish if video modeling is, in fact, superior to in vivo modeling for vocational skill acquisition for this population.

**Method**

**Participants**

Participants for this study were selected from a transitional and occupational programming classroom at the local University’s center for Autism (The Rich Center for Autism). Students in this class were already learning a variety of occupational skills as a part of their regular programming. Teachers in this room reported that the student’s current means of learning new vocational skills in this class took place primarily through live modeling by teachers. All students in this class were between 13 and 18 years of age. Consent forms were sent home to all five of the students in the class, and the study was verbally explained to all students and their parents/guardians. Four out of the five students received parental consent to participate in the study, all four of these students (three male and one female) then became participants in this study.

Participant 1 was a 13 year old male who academically functioned at a fifth grade level, and displayed above average verbal behavior and social skills as compared to his classmates. Participant 2 was a 14 year old male, who functioned academically at a third grade level, and displayed above average verbal behavior and social skills as compared to his classmates. Participant 3 was a 15 year old female who functioned
academically at a sixth grade level, and displayed less than average verbal behavior but above average written language as compared to her peers, and slightly below average social skills as compared to her classmates at the center. Participant 4 was a 14 year old male, functioning academically at a preschool level, with below average verbal and social skills as compared to his classmates.

**Skills Selected for Instruction**

All participants’ Individualized Education Plans (I.E.P.’s) indicated that they demonstrated strength in fine and gross motor skills. The first target behavior was folding clothes, and the two variations were folding a t-shirt and folding pants. Procedural steps for both folding tasks were taken directly from a national clothing department store’s folding protocol. The folds for both the t-shirt and jeans are company specific and must be completed in sequence to produce the correct end product. The second variation will be folding women’s jeans according to the same large chain department store’s protocol. Both variations for the target behavior of folding were broken down to seven steps.

The second target behavior was hardware preassembly, with two task variations differing in assembly order and end product. These tasks were modeled after templates at a local sheltered workshop that completes, packages, and ships these preassemblies for a variety of companies and where individuals with disabilities are paid according to how much they produce. Both variations under the preassembly target behavior consisted of seven steps.
Setting

Sessions took place in the participants’ normal classroom, in the back corner of the room and facing away from other students and teachers. This area contained a large round table which was normally used for one-on-one teaching. For the purposes of this study, the table was used to hold materials necessary for each session and was only occupied by the presenter (investigator) and the individual participant. The investigator, who was also all participants’ normal classroom instructor, served as the model in both conditions. Sessions lasted a maximum of ten minutes each and were conducted over a period of two weeks. Each ten minute session consisted of a single presentation method (video or in vivo) and one of the four tasks.

Materials

The materials used for all tasks in this study included an iPad which was used to display modeling and step prompting in the video condition, data sheets designed for the experiment (see Appendix A), and a clock/timer used for timing each session. Materials used for the folding tasks included a cardboard folding board used to fold the t-shirts, adult sized t-shirts, and adult sized jeans. Materials used for the hardware preassemblies included bolts, washers, brackets, nuts, small plastic baggies used to hold each completed assembly, and a small plastic basket for completed assemblies.

The folding board used for the t-shirt folding task was created out of a 26”x23” piece of cardboard, and replicated the functioning of folding boards used in department stores. The length of the cardboard was divided into three sections by two folds. The
outer two sections each measured eight inches and the middle section measured ten inches. Both folds were marked with black permanent marker for visual discrimination of the sections. Videos for all four tasks were constructed by the experimenter. The total task, all seven steps in the task analysis, was recorded with each step modeled at a slower and slightly more exaggerated pace than one would normally perform the task. This slower and exaggerated pace was modeled after Charlop-Christy and colleagues’ (1989) research and also served as a means to “trim” each step from the video to create the video prompts for each task. Each total task video was individually imported into Windows Live Movie Maker version 2011 for editing. For each recorded task, each step (1-7) was isolated and trimmed from the original video and saved as its own individual file. When completed, all four tasks had a total task video and seven separate videos clips for each step. All eight videos were then saved into their own file, for each task, and uploaded to the experimenter’s Google Drive account, where the videos could then be accessed on an iPad used in during the experiment.

**Dependent Variables**

The dependent variables in this study included the number of steps correctly completed (as modeled), the number repeated viewings each participant required before completing each step (video or live prompt), verbal prompts to engage in task, hand-over-hand intervention (if needed) for each step, and trials till mastery. Criterion for mastery was defined as independent task completion, without referring back to the modeled prompts, 90% of the time over three consecutive sessions. A step correctly
completed was defined as the participant independently and correctly replicating a step without the use of hand-over-hand intervention. A step not independently completed was defined as one requiring hand-over-hand intervention. Hand-over-hand intervention was only used if a participant was not able to independently correctly complete a step after three repeated viewings in one trial. A verbal prompt to engage in task was given after five seconds of no responding or incorrect responding to the current step. Examples of verbal prompts to engage were, “Do step__.” or “What’s step__?” Verbal prompts did not include any directives or information specific to how to complete the step, such as “Fold in half.” or “Pick up the washer.” Such directives were considered prompts in this study and the only prompts given for this study’s purpose were visual prompts (“repeated viewings”) via the respective condition. If the student was not able to correctly replicate the model, he/she viewed a prompt (via video or in vivo depending on current condition) of the first incorrect step followed by a simple verbal instruction to do what the model did.

Independent Variables

The independent variables were the methods of presentation, video or in vivo, for the assigned session as described in the materials section above.

Interobserver Agreement

Interobserver Agreement (IOA) data was collected by independent observers over 32% of all sessions. Independent observers used the same data collection sheets as the investigator and measured the same dependent variables. IOA was calculated
using total count IOA (Cooper, Heron, & Heward, 2007, p.115) and expressed as a percentage of agreement. There was a total of 96% agreement over all dependent variables between the investigator’s data and the independent observer’s data.

**Procedure**

All participants were exposed to two vocational target behaviors (folding and hardware preassembly) which each consisted of two variations, one modeled through video and the other in vivo. All participants were exposed to both target behaviors (i.e., all four tasks). For the target behavior of folding clothes the two variations were folding an adult sized t-shirt and folding adult sized women’s pants. The second target behavior was hardware preassembly, with the variations being two different assemblies resulting in two different fixed units. Each session consisted of one participant being exposed to one variation of a target behavior via video modeling, and the other variation of the same target behavior was modeled via in vivo modeling during a separate session. This balance carried over all four variations and all four participants. In both conditions, the experimenter stood next to the participant at the table containing all necessary work materials and explained to the participant what they were going to be doing. Directions were general to the task and specifics such as how to complete the task were not given. Each session, in both conditions, lasted a maximum of ten minutes. Each session terminated when either ten minutes was reached or the task was mastered. Criterion for mastery was defined as independent task completion (without referring back the modeled prompts) 90% of the time over three consecutive trials. A trial was defined as
the completion of steps one through seven for one unit (independent or hand-over-hand). With session durations of ten minutes, there were opportunities for several trials to occur over one session.

Each session began with verbal directions and the participant viewing the total task model, via whichever condition they were currently in, video or in vivo, of the target task for that session.

If a participant was first exposed to the video condition for folding shirts, that participant was then exposed to the in vivo condition for folding jeans. The same participant would then be exposed to the in vivo condition first for hardware preassembly and to the video condition second for the other hardware variation.

**Video condition**

In the video condition, participants were told that they were going to watch a video of the investigator completing a task and that after watching the video it will be their turn to do the task. They were told if they had trouble completing a step or forgot what do, they can ask the experimenter to view the step again. The experimenter then held the iPad up to meet the student’s vision and played the total task video model of the vocational skill being targeted for the session. The video consisted of the model performing each sequential step of the task and verbally saying “Step one.”, “Step two.”, “Step three.”, etc., directly before engaging in each step. Each video prompt cut out from the total task also included the verbal descriptor of the step number at the beginning of the clip. The participant was then asked to replicate the task. Only the
materials needed for task completion were on the table and were within reach of participant. If the participant did not begin to engage in the task within five seconds of being cued (i.e., asked to replicate model directly after seeing the video), one verbal prompt was given for student to engage in task. If the participant did not engage in the next sequential step within fifteen seconds, they were given a verbal prompt to engage in the step. If the participant was not able to correctly replicate a modeled step, they were shown a video prompt of only the first uncompleted step, and then cued to do it. If a participant asked for help during any step, they were shown the video prompt of the step. If a participant was not able to complete a given step within three repeated viewings, hand-over-hand intervention was used for that step only followed by a verbal instruction for the participant to complete the next step. If a participant skipped a step, error corrective procedures were given immediately in order to break the chain of incorrect responding. Error corrective procedures consisted of one verbal prompt referring to the numbered step missed (e.g., “Do step__.”, “What’s step__?”). If the participant did not go back and complete the missed step or was not able to correctly produce the step, the task was paused and a repeated viewing of the step was shown to the participant via video prompt and then the participant was cued again to do the step.

**In Vivo Condition**

In the live condition, participants were presented with a live model (the experimenter) completing the vocational task. The live model presented the total task in the same sequential order as the task modeled through the video condition, with the
same verbal descriptors prior to each step (e.g., “Step one.”, “Step two.”, etc.) and with the pace and task execution as close to the video model as possible. The method of prompting, criteria for repeated viewings, error corrective procedures, hand-over-hand intervention and data collection remained the same as in the video condition, with the only difference of repeated presentation of steps being demonstrated by the live model.

**Differential Reinforcement**

Differential reinforcement was provided in both conditions and contingent on the same target behaviors. Examples of types of primary and secondary reinforcement provided include verbal praise, high fives, pats on the back, preferred edibles, and other preferred reinforcers as indicated on the students’ individualized Rich Center preference assessments. Secondary reinforcement was provided for visually attending to models, successful completion of each step, and total task completion. Primary reinforcement was given at the conclusion of each session and was non-contingent on performance during the session.

**Results**

Results of this study found both live modeling and video modeling to be equally effective means for vocational skills. The study demonstrated that learning occurred in both conditions – video modeling and in vivo modeling – and both conditions resulted in mastery of all four skills for three out of four of the participants, and the mastery of three out of four skills for the fourth participant. Additionally, the only difference this study found was that both hardware assemblies were much easier for all four
participants to complete independently with fewer repeated viewings regardless of condition, video or in vivo (see figures 1 and 2). Effects of both conditions were measured by the total number of repeated viewings and verbal prompts needed before mastery of each task was reached (see figures 4 and 5).

Participant 4 required many more repeated viewings in both conditions and with all tasks (see figure 3). Although his data shows the video condition required almost 1/3 the amount of repeated viewings as the in vivo condition (76 to 216), it should be noted that 72 of the 216 repeated viewings were for the same step of the jeans task. This participant is also the only participant to show a difference between conditions for the need for verbal prompts, with requiring 163 in the in vivo condition and 67 in the video condition. But again, 42 of the 163 verbal prompts needed in the in vivo condition were from just one step in the sequence.
Participant 1

Video (jeans) - 4 repeated step viewings, 5 verbal prompts, 4 trials until mastery

In vivo (shirt) - 1 repeated step viewing, 1 verbal prompt, 3 trials until mastery

Video (HA1) – 0 repeated step viewings, 0 verbal prompts, 3 trials until mastery

In vivo (HA2) – 0 repeated step viewing, 0 verbal prompts, 3 trials until mastery

Participant 2

Video (shirt) - 9 repeated step viewings, 2 verbal prompts, 4 trials until mastery

In vivo (jeans) - 2 repeated step viewings, 3 verbal prompts, 4 trials until mastery

Video (HA2) – 0 repeated step viewings, 1 verbal prompt, 3 trials until mastery

In vivo (HA1) – 0 repeated step viewings, 2 verbal prompts, 3 trials until mastery

Participant 3

Video (jeans) - 0 repeated step viewings, 4 verbal prompts, 3 trials until mastery

In vivo (shirt) - 3 repeated step viewings, 1 verbal prompt, 4 trials until mastery

Video (HA1) – 0 repeated step viewings, 0 verbal prompts, 3 trials until mastery

In vivo (HA2) – 0 repeated step viewings, 0 verbal prompts, 3 trials until mastery

Participant 4

Video (shirt) - 71 repeated step viewings, 59 verbal prompts, 22 trials until mastery

In vivo (jeans) - 203 repeated step viewings, 141 verbal prompts, 26 trials, not mastered

Video (HA2) – 5 repeated step viewings, 8 verbal prompts, 7 trials until mastery

In vivo (HA1) - 13 repeated step viewings, 22 verbal prompts, 7 trials until mastery
Figure 1. Total repeated viewings of steps across both presentation conditions, for participants 1, 2, 3, and 4.

Figure 2. Total repeated viewings of steps across both conditions, for participants 1, 2, and 3.
Figure 3. Total repeated viewings of steps across both conditions, for participant 4.

Figure 4. Total repeated viewings in each condition, for each participant.
Figure 5. Total verbal prompts to engage in task for each participant.

Discussion

Although video based instruction, specifically video modeling, is repeatedly referred to as an effective means for teaching skills to students diagnosed with Autism Spectrum Disorder, there is little research comparing this method of instruction to that of a live model. Furthermore, no studies published to date have compared these two methods for training vocational skills to adolescents diagnosed with ASD. The purpose of this study was to identify whether video modeling was more effective than live modeling for teaching vocational skills to adolescents diagnosed with ASD. The results suggested that both methods were equally effective for teaching vocational skills to adolescents diagnosed with ASD.

Video modeling is often sighted as producing rapid acquisition of skills. Corbett (2003) claimed video modeling is superior to other methods of intervention. Results of
this study found both modeling conditions produced the same effects for learning the
two vocational skills. That no differences were found between the two methods of
instruction, video or in vivo, is in and of itself an important finding. It suggests that,
among other things, despite many popular press articles claiming an electric digital
video learning revolution; neither method is a priori superior to the other. Thus,
teachers may prefer one method to another depending on their individual teaching
situations and their students’ unique learning situations. For example, in an
understaffed classroom, instruction with video modeling may be able to replace some of
the critically needed one-on-one instruction. In other cases, such as when an individual
student requires constant prompting with primary reinforcers attend to the task at
hand, and is unable to attend to a video, in vivo modeling may be necessary. Instead of
establishing the superiority of one method over the other to teach vocational skills; the
current findings suggest that both in vivo and video modeling may be important tools
for the instructor to have in their “teaching toolbox.” Hammond and colleagues (2010)
point out that video instruction, i.e. the presentation of a model via video, provides
additional opportunity for participants to learn through observation. The current
study’s findings’ support this observation but suggests one method is not necessarily
superior to the other.

Previous studies on video based instruction point to the immediate
reinforcement and positive feedback that video instruction often provides. Charlop-
Christy and colleagues (2000) found video modeling led to faster acquisition of tasks
compared to in vivo modeling. They contributed these effects to video modeling’s motivating and attention maintaining qualities. However, this study did not differentiate in reinforcement between conditions and furthermore the participants never had physical contact with the iPads and all controls on this device were only accessed by the experimenter. These reinforcement variables were kept the same in order to more narrowly determine the learning differences, if any, between video and teacher presentation when all other variables are held constant. This study found that the methods are equivalent when other variables were held constant.

Limitations

One limitation of the current study may be that there were no initial baselines taken. All participants’ parents and teachers were asked prior to beginning the experiment if their child had, to their knowledge, ever folded clothing according to department store protocol and if they had ever been exposed to the unique hardware preassemblies being used in the study. All parents and teachers confirmed that their child/student had never been exposed to these specific and unique tasks. Because all four tasks were a brand new skill that had not been introduced to any of the participants prior to the experiment, an initial baseline was omitted. However, including an initial probe or baseline could have addressed any concerns of a participant potentially knowing any or all of the steps before they were introduced in the experiment. An additional limitation of this study include that the hardware preassemblies were overall easier for all four participants. The experimenter attempted
to use tasks that were as similar in difficulty as possible but ones that also differed in order to help eliminate carry over effects. Although the four tasks chosen for this study fit these criteria, the data shows that the two hardware tasks were not equal in level of difficulty compared to the folding tasks. Another possible limitation was after Participant 2’s mother read and signed the consent form (approximately one week before the experiment began) she told the participant the study included folding clothes. The mother reported that the participant then spent the next several days “practicing” folding clothes at home in order to “do a good job” for his teacher. Although the unique folds in this study were not the folds the participant “practiced” at home, this could have created an incompatible response tendency and frustration for the student when he was trained to fold differently for the actual study.

Although video modeling is repeatedly cited for its rapid effects for acquiring new skills, the current research suggests in vivo modeling to be an equally effective tool when used to teach vocational skills to adolescents diagnosed with autism spectrum disorder. That no difference was found between the two methods of presentation is, in itself, an important finding. Educators strive to provide students with the best resources available to them, in effort to maximize learning potential. Video based instruction is not always a viable option for educators due to variables including time, money, available technology, and skill deficits. Equally so, the luxury of one-on-one live instruction is not always a conducive option for busy instructors who may be attempting to divide their time between multiple students and learning environments. In this
study, teaching vocational skills to adolescents with ASD required up to 71 repeated viewings of individual components of a skill, before it was mastered. With skill mastery requiring this many modeled presentations, choosing the most feasible method of presentation is certainly a concern for a teacher when considering their options. The results of this study identified both video modeling and in vivo modeling to be equally effective means for teaching vocational skills to learners with ASD. As both instructional methods were found to be equally effective, these findings suggest the method of instructional delivery for modeling (in vivo or video) may be catered to the individual learning situation and student.
References


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Appendix A

Data Collection Form

Investigator:__________________  Independent Observer:________________
Participant:___________________  Session Date & Time/Duration:________________
Target Behavior:_______ Variation:_______ Presentation Type (video/in vivo):________

<table>
<thead>
<tr>
<th>Task Step</th>
<th>Verbal prompt to engage in task (frequency)</th>
<th>Repeated viewing (frequency)</th>
<th>Step completed independently (Y/N)</th>
<th>Hand-over-hand intervention (Y/N)</th>
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