Abstract: Self-instruction is a pivotal skill that promotes independence and self-determination by allowing individuals to independently access prompts during the acquisition of new skills while decreasing the need for support from another person. Self-mediated video modeling (SMVM) and video self-prompting (VSP) are two methods of video-based self-instruction in which individuals use technology to access visual support while practicing new skills. This study evaluated the efficiency of SMVM versus VSP to teach four high school females with intellectual disability art-related tasks in a school setting. An adapted alternating treatments design was used to compare the effects of SMVM and VSP on sessions to criterion and instructional time to criterion. Results indicated that both SMVM and VSP resulted in an increase in percentage of correct responses across all participants, but VSP tasks resulted in all participants reaching mastery criterion in the fewest sessions to criterion.

Self-instruction occurs when an individual uses resources available to learn a skill rather than relying on support or guidance provided directly by another person. The materials used for self-instruction may serve as the prompt to notify the learner of the step that should occur next in a sequence to complete a skill (Browder & Shapiro, 1985). Self-instruction promotes monitoring of one’s own behaviors when completing a task and is a form of self-directed learning. Teaching individuals how to self-instruct fosters self-determination (Agran & Wehmeyer, 2000). Self-determination is the ability to make decisions on one’s own life and plays a role in the success of an individual after graduating high school (Wehmeyer & Palmer, 2005). Self-instruction is a pivotal skill in that it allows individuals to not only learn one to three target behaviors, but instead, can potentially have collateral effects on several behaviors if the self-instruction skills generalize (Smith, Shepley, Alexander, & Ayres, 2015). For instance, once an individual learns how to self-instruct while learning to make a ham and cheese sandwich, they have acquired two skills (making a sandwich and self-instruction). While making a ham and cheese sandwich is valuable in a particular context, the skill of using a set of procedures to self-instruct creates opportunities to learn new skills.

Individuals with intellectual disability (ID) rely on teachers and other postsecondary instructors, such as job coaches, to predict and teach skills needed for obtaining and maintaining employment and for independent living. Teaching each skill in isolation that is required for future employment or community settings is an inefficient use of time and resources. Further, teaching all skills needed to fully integrate into one’s community and live independently is impossible. Instructors and teachers might consider teaching individuals how to self-instruct rather than teaching skills in isolation to maximize instruction time and increase independent skills (Smith et al., 2015). With web-based resources like YouTube, engaging in self-instruction has become more commonplace. For instance, if one needs to change a battery in a car, learn to fix a dishwasher, or even play an instrument, they can find instructional materials for free on YouTube. The challenge instructionally then
is to teach individuals with ID to sift through the available instructional resources to identify a prompt corresponding to their needs. Learning to self-instruct has the dual benefit of decreasing reliance on others while allowing a learner to pursue those topics of greatest need and interest to him or herself. Further, self-instruction may result in less stigmatization because rather than a teacher or job coach accompanying an individual into the natural environment, the learner can use mobile technology to self-instruct. Additionally, because self-instruction reduces dependence on instructors, instructors may have more time to dedicate to working with other learners or completing other duties.

Smith et al. (2015) reviewed the research on self-instruction strategies for individuals with ID that specifically resulted in generalization to novel skills. The results indicated that 56 of 57 included participants in the review learned at least one multi-step skill with a self-instructional strategy, “meaning the participant independently controlled and manipulated the [self-instruction] materials” (p. 21). The review identified three times within the experimental process in which individuals learned to self-instruct, including the use of history training prior to the baseline condition, teaching between baseline and intervention, or teaching during the intervention itself. Of the 56 individuals with ID that successfully acquired a self-instructional strategy, only 32 generalized this strategy to learn at least one additional multi-step skill. Smith et al. identified potential barriers related to generalization of self-instructional skills in the included studies. One example barrier was 7 of the 19 studies incorporated vocal directions to use the self-instruction tool in their task direction (e.g., “Restock the vending machine. Watch the video on your iPod”). Fundamentally, this means the learners did not have to discriminate on their own that they needed to use their self-instructional tools, rather they were directly coached by an instructor to do so. This, in some ways, defeats the end goal of self-instruction. Another issue that Smith et al. (2015) cited related to a lack of instruction for learners on how to search for and select self-instructional materials. In 18 of the 19 included studies, researchers directly loaded the self-instructional materials to the specific prompt required for task completion (e.g., the audio tape corresponding to target task was loaded in the cassette player or a video model demonstrating the targeted skill was loaded to a mobile device). An alternative would be teaching an individual to navigate through their self-instructional tool to locate a specific prompt among multiple available options. As technology has advanced, self-instructional tools have the potential to store multiple needed prompts to complete identified targeted skills.

The tools used by individuals with ID to self-instruct have evolved since the 1980s when researchers used books and picture prompts to teach a novel set of skills (e.g., Wacker & Berg, 1983, 1984). Self-instruction later incorporated more high-tech tools, such as cassette players with headphones to provide auditory prompting in the late 1990s (Trask-Tyler, Grossi, & Heward, 1994), and portable DVD players to promote self-mediated video modeling (SMVM) in the early 2000s (Mechling, Gast, & Fields, 2008; Mechling & Stephens, 2009). Beginning in 2009, handheld devices became more prevalent on the technology market; therefore, the tools used in self-instructional research followed suit. Mechling, Gast, and Seid (2009) taught participants SMVM using a Hewlett Packard iPAQ Pocket PC to complete cooking recipes. The first-generation Apple iPhone was released in 2007 (Apple Inc., 2007) and Bereznak, Ayres, Mechling, and Alexander (2012) first used it as a self-instructional tool for learners with ID and autism spectrum disorder (ASD) to complete vocational and independent living tasks.

Additional research has focused on video prompting self-instruction, or video self-prompting (VSP), in which a video of a task is separated into steps so that the individual views and then imitates a single step or a few steps of the task at a time, as opposed to the entire task in video modeling. Bereznak et al. (2012) evaluated the use VSP and taught three high school students how to pause and play video prompts of vocational and daily living skills such as using a washing machine, making noodles, and using a copy machine. After each step in the task analysis, the video displayed a stop sign for 4 s signaling to the participant to pause the video and complete the demonstrated step. Two of the three par-
Participants learned to pause and play the video prompts and reached mastery criterion of the various vocational and daily living tasks. Shepley, Spriggs, Samudre, and Elliott (2017) taught four middle school students with ID to self-instruct using a similar VSP format. The researchers created videos with embedded pause signs [similar to Bereznak et al.’s (2012) stop signs] to cue the participants to pause the video, complete the demonstrated step(s), and resume play to view additional video prompts. All participants learned to navigate the technology to find the necessary videos and pause/play videos using a system of least prompts instruction. After completing technology training, three of the four participants were able to self-instruct using video prompts to acquire a novel daily living task sequence (i.e., set the table, make noodles, and make a cup of punch). These studies provided support for video prompting as an effective self-instructional tool for learners of various ages with ID.

As mentioned above and represented in the published video-based instruction literature, videos can take one of two forms, video modeling and video prompting. Both methods have led to skill acquisition, yet it is important to assess efficiency of instruction to ensure instructional time is spent wisely, thus maximize outcomes for learners with ID. Mechling, Ayres, Bryant, and Foster (2014) compared VM and VP, along with continuous VM, in which the video looped until the researcher stopped the video. For all three forms of video instruction, the researcher delivered components of the self-instruction task analysis (e.g., setup the technology, pressed play on the videos); therefore, the participants did not fully self-instruct. Mechling et al. (2014) found that VP was most efficient (i.e., sessions, time, and errors to criterion) when acquiring chained tasks in which each step in the task analyses was completed only once. Taber-Doughty et al. (2011) compared the two self-instruction strategies, SMVM and VSP, in conjunction with system of least prompts instruction to teach cooking skills to middle school students with ID. The authors concluded that video modeling was more effective for two of the three included students and video prompting was more effective for the third participant. Given that researchers used system of least prompts instruction in conjunction with video-based instruction and sessions were not conducted to mastery criterion, additional research is needed to determine which method in isolation is more efficient.

Two forms of video-based self-instruction include video modeling and video prompting. Both strategies incorporate videos but are different in the presentation of the videos. Video prompting task analyzes the various steps of a skill and segments the video so that each clip serves as a prompt to complete that step of the skill. Video modeling displayed the entire targeted tasks as one video prior to allowing the learner to imitate the observed steps. While these various forms of self-instruction are both effective interventions (i.e., have resulted in acquisition of novel tasks) more information is necessary to determine the most efficient self-instructional method for individuals with ID. The purpose of this study was to compare the efficiency of self-instruction with mobile technology when presented as a SMVM and when presented as VSP. The research question was: Will self-instruction using SMVM or VSP result in more efficient instruction (i.e., rate of acquisition) for participants with ID?

**Method**

**Participants and Setting**

Four high school females ages 15 to 20 years old participated in the study. All participants attended a rural public high school and received daily instruction in a special education classroom. Through school eligibility, one participant was identified as having moderate ID (Meg), two with mild ID (Jo and Amy), and one with ASD and mild ID (Beth). Specific participant demographic information is located in Table 1. All participants demonstrated the prerequisite skills of attending to a task for 10 min, imitating a video model, receptively discriminating between five pictures, and fine motor skills that allowed navigation of an iPhone as well as the fine motor skills required for the target tasks. Additionally, all participants had previous experience with mobile technologies, and three had their own devices (e.g., iPod Touch). The study took place in a teacher workroom down the hall from the participants’ special education class-
Materials

Instructional materials. The researchers used two iPhone 4s loaded with video models and video prompts of the target tasks to provide video-based instruction to the participants. Videos were filmed from a performer’s point of view (Ayres & Langone, 2007) depicting two hands completing the target origami tasks, providing the same perspective of the task that participants would see as they complete the tasks themselves. Origami tasks were used to increase internal validity by reducing the likelihood that participants had previous exposure to the tasks and to equate task difficulty for precise comparison. Voice narration verbalizing the steps within the task analyses were added. Videos were uploaded to the iPhone and stored under the Videos application which was located in the top right corner of the iPhone home screen.

Task materials. Task materials for each condition consisted of a 15 cm × 15 cm origami paper (i.e., green for tree, red for heart, brown for cup). Data collection sheets were used in each session that allowed data collectors to track percentage of correct responses, sessions to criterion, instructional time to criterion, and procedural fidelity.

Technology Training

Following baseline sessions and prior to beginning the comparison condition, all participants were taught to initiate self-instruction by pulling the iPhone out of their pocket, navigate to the video corresponding to the task direction, view the video, and press pause/play if the screen displayed a pause sign. Videos and tasks used in technology training were different than those used in the experimental design. The training tasks involved nonsense and unpredictable folds in origami paper, meaning the end product did not result in an identifiable object or animal like traditional origami. These nonsense tasks were labeled by the color of the paper (e.g., “Make the origami purple shape”) to ensure the participant needed to self-instruct. These self-instructional steps were taught using a system of least prompts procedure in which the researcher provided a verbal prompt (e.g., “Press the videos icon”), followed by a gesture (e.g., pointing to the videos icons) if incorrect or no response, followed by a physical prompt (e.g., guiding the participant’s finger to press the videos icon) to ensure correct responding. Training was conducted until each participant performed two consecutive sessions at 100% independent correct responding for phone navigation steps for a SMVM task and for a VSP task, and then again for two consecutive sessions at 100% for a second novel SMVM and VSP task. See Table 2 for technology training data.
### Table 2

**Technology Training Sessions to Criterion and Time in Instruction**

<table>
<thead>
<tr>
<th></th>
<th>SMVM</th>
<th></th>
<th>VSP</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sessions to Criterion</td>
<td>Sessions to Criterion</td>
<td>Total Duration in Instruction</td>
<td>Total Duration in Instruction</td>
</tr>
<tr>
<td>Task 1</td>
<td>Task 2</td>
<td>Task 1</td>
<td>Task 2</td>
<td></td>
</tr>
<tr>
<td>Meg</td>
<td>5</td>
<td>6.25 m</td>
<td>2</td>
<td>2.48 m</td>
</tr>
<tr>
<td>Jo</td>
<td>3</td>
<td>5.52 m</td>
<td>2</td>
<td>3.12 m</td>
</tr>
<tr>
<td>Beth</td>
<td>3</td>
<td>4.92 m</td>
<td>2</td>
<td>2.15 m</td>
</tr>
<tr>
<td>Amy</td>
<td>4</td>
<td>8.35 m</td>
<td>2</td>
<td>2.52 m</td>
</tr>
<tr>
<td>Mean</td>
<td>3.75</td>
<td>6.26 m</td>
<td>2.57 m</td>
<td>10.16 m</td>
</tr>
</tbody>
</table>

**Note:** SMVM = Self-mediated video modeling; VSP = Video self-prompting; m = minutes.

### Table 3

**Task Analyses for Origami Tasks**

<table>
<thead>
<tr>
<th>Task</th>
<th>Task Steps</th>
</tr>
</thead>
</table>
| Cup  | 1. Fold one corner to opposite corner with brown side showing  
2. Turn paper so point is at top  
3. Fold top point of top paper down to flat edge  
4. Unfold step 3  
5. Fold left corner over to meet right side at crease  
6. Fold right corner over to meet left side  
7. Fold top flap down along horizontal line  
8. Unfold step 7  
9. Make an opening in cup and fold top flap into opening  
10. Fold top point down over cup  
11. Unfold step 10  
12. Make an opening in cup top and fold flap into cup opening  
13. Use fingers to open cup |
| Tree | 1. Fold one corner to opposite corner with green side showing  
2. Unfold step 1  
3. Fold right point along mid-line  
4. Fold left point along mid-line  
5. Flip paper over  
6. Fold right point along mid-line  
7. Fold left point along mid-line  
8. Flip paper over  
9. Fold bottom point up to top point  
10. Flip paper over  
11. Fold top point down to edge so it hangs over around 1.5 inches  
12. Fold bottom point up a little bit  
13. Flip paper over |
| Heart| 1. Fold one corner to opposite corner with red side showing  
2. Turn paper so point is at top  
3. Fold right corner up to top point  
4. Fold left corner up to top point  
5. Flip paper over  
6. Fold top two flaps down to bottom point  
7. Fold top right point to right corner along midline  
8. Fold top left point to left corner along midline  
9. Unfold steps 7 and 8  
10. Open top right flap and fold in along mid-horizontal line  
11. Open top left flap and fold in along mid-horizontal line  
12. Fold top right point down  
13. Fold top left point down  
14. Fold in right corner a little bit  
15. Fold in right top point a little bit  
16. Fold in left corner a little bit  
17. Fold in left point a little bit  
18. Fold bottom two flaps up to center  
19. Flip over and prop up heart |

**Dependent Measures**

Data were collected on three dependent variables: percentage of correct responses, sessions to criterion, and instructional time to criterion. For a response to be scored as correct, it had to be a topographically accurate response according to the task analysis, be initiated within 5 s of a discriminative stimulus, and completed within 15 s. Incorrect responses occurred due to latency errors (not initiating the step within 5 s), duration errors (not completing the step within 15 s), or topographical errors (not engaging in the correct action to complete the step). The number of correct responses was divided by the total number of responses and multiplied by 100 to obtain the percentage of correct responses per session (see Table 3 for task analyses of the targeted tasks). Sessions to criterion consisted of the number of instructional sessions required for a participant to reach 100% mastery per task. Instructional time to criterion was defined as the total time required during all instructional sessions for a given treatment. This was calculated by starting a stop watch after delivery of each task direction and stopping upon completion of the final step in each
task analysis. The duration for each task was summarized to report total time in instruction with each independent variable.

A secondary observer collected interobserver agreement (IOA) data and procedural fidelity (PF) data for a minimum of 20% of sessions in all conditions for each treatment. Inter-observer agreement was calculated using point-by-point agreement in which the number of agreements were divided by the number of agreements plus disagreements and multiplied by 100 (Ayres & Ledford, 2014) resulting in 100% IOA for all sessions. Procedural fidelity was collected on the following researcher behaviors: (a) correct responses received praised on a CRF schedule of reinforcement, (b) incorrect responses were corrected using a multiple opportunity probe, (c) the phone was in the participant’s pocket 3 to 10 min before sessions, (d) the correct task direction was delivered, (e) the correct origami paper was handed to the participant, (f) the timer was started following the task direction and stopped upon completion of the final step, and (g) researcher implemented multiple opportunity probe correctly including adhering to latency and duration time restraints and correcting incorrect steps out of view of the participant. PF was calculated by dividing the number of observed research behaviors by the number of planned researcher behaviors and multiplying by 100 (Gast, 2014). Mean PF was 99.8% across all sessions with a range of 97% to 100%.

Experimental Design

An adapted alternating treatments design (Sindelar, Rosenberg, & Wilson, 1985; Wolery, Gast, & Ledford, 2014) was used to compare the effects of SMVM to VSP. The design included a baseline phase to first establish student performance on the origami tasks for a minimum of three sessions or until stable (i.e., a decelerating or zero-celerating trend in the data path). The comparison condition of the study was initiated in which participants were asked to fold each of the three different origami figures. The SMVM and VSP tasks were counterbalanced across students, and the same task (i.e., origami heart) was used for the control set for all participants. Each participant was only exposed to one treatment per origami figure. The control condition was used to allow for an opportunity to replicate the demonstration of the effect of the more efficient instructional procedure and provide a more compelling case for a functional relation. The sequence (SMVM, VSP, and control) of tasks was randomized each day and all three sessions were conducted each day. Sessions were conducted three to five days a week with no more than one session for each task conducted a day. Following at least six sessions and the acquisition of at least one origami figure (100% of steps performed correctly with the instructional procedures), the comparison condition stopped and the replication condition began. In the replication condition, the treatment that resulted in the most rapid acquisition (based on the number of training sessions) was then applied to the control task, allowing for an opportunity to replicate the acquisition effects. If one of the tasks in the initial comparison failed to reach mastery criterion, the participant received additional instruction on that task with the treatment that was most effective (i.e., best treatment condition).

Procedure

General procedures. Three to ten min prior to running a session, the researcher gave the participant an iPhone, loaded with videos corresponding to that condition and participant, and asked them to place the phone in their pocket. This was done to replicate how the general population begins to self-instruct (Smith et al., 2016). Once seated at the table in the teacher workroom, the researcher delivered the task direction to (e.g., “Make an origami cup, use your phone if you want to”) while handing the participant the origami paper that corresponded with the task direction. For each task, participants were given 5 s to initiate, and if initiated, 15 s duration to complete each step. If participants failed to initiate or responded incorrectly, the researcher performed the step out of view of the participant and represented the paper to the participant so the following step could be performed (i.e., multiple opportunity probe; Cooper, Heron, & Heward, 2007). This continued until either the participant or the researcher completed the final step for each task. All correct steps...
received general verbal praise (e.g., “Nice job”).

Baseline. Sessions followed general procedures. During baseline conditions, the videos loaded on the iPhone restated the task direction and showed a picture of the final product, but did not play any step by step videos to complete the targeted tasks.

Comparison. All sessions followed general procedures. During SMVM sessions, a video depicting the entire task, start to finish, was loaded in the iPhone. While watching the video model, attempts to fold along with the video were blocked in order to ensure VM was implemented as described in the literature, as opposed to simultaneous VM in which a learner imitates a video model while it is playing (Sancho, Sidener, Reeve, & Sidener, 2010; Taber-Doughty, Patton, & Brennan, 2008). To block, the researcher placed a hand on the origami paper until the video finished. During VSP sessions, videos included a 4 s pause sign between each step in the task analyses. This red and white pause symbol was accompanied by an audible “pause.” Attempts to fold along with the video were blocked by placing a hand on the paper until the participant pressed paused. If a participant continued to complete a step before viewing the corresponding video prompt, the researcher blocked this attempt by placing a hand on the origami paper and pointed to the phone. Control sessions were identical to baseline procedures. The comparison condition was conducted for a minimum of six sessions and until a treatment reached criterion of 100% correct responding for one session.

Replication. The treatment with the fewest sessions to criterion was applied to the control task to evaluate for intrasubject replication of treatment effects (Wolery et al., 2014). The same procedures were used as described in the comparison condition for that specific treatment. Replication sessions were conducted for a minimum of three sessions and until the participant reached criterion of 100% correct responding for one session.

Best treatment. If a participant did not reach criterion with both treatments during the comparison condition, the treatment with the fewest sessions to criterion (i.e., the best treatment) was applied to the task that did not reach criterion. This was conducted to assess if applying the best treatment to a task with previous intervention would produce therapeutic changes in participant’s behavior. The same procedures were used as described in the comparison condition for that specific treatment. Best treatment sessions were conducted for a minimum of three sessions and until the participant reached criterion of 100% correct responding for one session.

Results

Figures 1 and 2 demonstrate each participants’ correct responding for the SMVM, VSP, and control tasks. Visual analysis of the data revealed an increase in level for both SMVM and VSP tasks for all participants. Additionally, all participants reached mastery criterion on the VSP task and one participant reach mastery on both the VSP and the SMVM task. Overall, the fewest sessions to criterion for all participants was the VSP task, making it the best treatment based on the results of this study.

Meg

During baseline, Meg performed 5% (range 0–15%) of her SMVM task (origami tree), 21% (range 15–23%) of her VSP task (origami cup), and 11% of her control task (origami heart). During the comparison condition, she performed 44% (range 23–62%) SMVM task, 84% (range 54–100%) VSP task, and 20% (range 5–26%) control task. She reached criterion on her VSP task in eight sessions and was in VSP instruction for a total of 48.47 min until mastery, with each session lasting an average of 4.91 min.

VSP was introduced to the control task in the replication condition, resulting in an immediate change in level and an accelerating trend until reaching mastery in six sessions. Meg’s performance on the control task during the replication condition was 86% (range 74–100%) and lasted a total of 47.25 min (an average of 7.88 min per session). Lastly, VSP was applied to the SMVM task in the best treatment condition, resulting in 82% (range 69–100%) correct responding and reaching mastery in five sessions.
Beth

During baseline, Beth performed 18% (range 15–23%) of her SMVM task (origami tree), 9% (range 8–15%) of her VSP task (origami cup), and 24% (range 21–32%) of her control task (origami heart). During the comparison condition, she performed 87% (range 62–100%) SMVM task, 100% VSP task, and 32% (range 21–37%) control task. She reached criterion in four sessions using SMVM and reached criterion within one session using VSP. Regarding total time spent in instruction until mastery, Beth was in SMVM instruction for 18.47 min (an average of 4.62 min per session) and VSP for 5.82 min.

VSP was the more efficient instruction based on sessions to criterion and therefore was introduced to the control task in the replication condition, resulting in an immediate and abrupt change in level, reaching mastery in four sessions lasting a total of 33.58 min (an average of 8.40 min per session). Beth’s performance on the control task during the replication condition was 93% (range 89–100%).

Jo

In baseline, Jo performed 21% (range 8–38%) of her SMVM task (origami cup), 27% (range 15–38%) of her VSP task (origami tree), and 13% (range 11–16%) of her control task (origami heart). During the comparison condition, she performed 79% (range 54–92%) SMVM task, 94% (range 77–100%) VSP task, and 41% (range 21–47%) control task. She reached criterion with her VSP task in four sessions and was in VSP instruction to mastery for a total of 26.52 min, with each session lasting an average of 6.63 min.

VSP was introduced to the control task in the replication condition, resulting in an immediate change in level and an accelerating
trend until reaching mastery in four sessions. Jo’s performance on the control task during the replication condition was 88% (range 74–100%) and lasted a total of 37.22 min (an average of 9.30 min per session). Lastly, VSP was applied to the SMVM task in the best treatment condition, resulting in 97% (range 92–100%) correct responding and reaching mastery in two sessions.

Amy

During baseline, Amy performed 5% (range 0–8%) of her SMVM task (origami cup), 18% (range 8–23%) of her VSP task (origami tree), and 21% (range 5–26%) of her control task (origami heart). During the comparison condition, she performed 64% (range 54–77%) SMVM task, 89% (range 77–100%) VSP task, and 43% (range 37–53%) control task. She reached criterion with her VSP task in five sessions and was in VSP instruction for a total of 40.33 min, with each session lasting an average of 8.07 min.

VSP was introduced to the control task in the replication condition, resulting in an immediate change in level and an accelerating trend until reaching mastery in six sessions. Amy’s performance on the control task during the replication condition was 89% (range 79–100%) and lasted a total of 64.17 min (an average of 10.69 min per session). Lastly, VSP was applied to the SMVM task in the best treatment condition, resulting in 86% (range 77–100%) correct responding and reaching mastery in seven sessions.

Discussion

Overall VSP resulted in independent task performance for all participants and was the more efficient self-instructional tool. These results are consistent with the literature comparing teacher-directed video modeling to video.
prompting (Cannella-Malone et al., 2011; Cannella-Malone et al., 2006; Mechling et al., 2014), in that video prompting was more efficient in terms of the number of sessions to criterion. Few studies in the literature report the time required to training in self instruction. While VSP may take more time to initially train, (for example, in this study it took 6 min for SMVM compared to 10 min for VSP); however, in the long term, the learner will acquire other novel skills in fewer sessions than if learned using SMVM. However, it should be noted that learning, or skill mastery, has not truly occurred until the learner acquires the skills, demonstrates the skill with fluency similar to that of a same-age peer, generalizes the skills to new stimuli, and maintains the skill after instruction ends (Cooper et al., 2007). This study only evaluated the efficiency of that first learning phase, acquisition, and did not account for the other phases which are equally important components of learning.

In 2015, Smith et al. reported training procedures to teach self-instruction but noted that they did not teach two critical skills. They did not evaluate methods to teach initiation steps and locating video supports. These two skills are critical for generalization and use in the natural environment. The present study provides some evidence suggesting that system of least prompts can be used to teach these steps.

Limitations

Readers should interpret the results of this study in the context of several limitations. First, even though SDVM and VSP were student mediated, the researcher still blocked errors and provided praise on a CRF schedule. Therefore, the students’ skill acquisition did not occur totally independent of an instructor. Second, mastery criterion was only set at one session at 100% correct, increasing this to require more demonstrations at 100% correct would help to evaluate for chance responding on some steps. Relatedly, the condition not reaching mastery level should have been run until the student either mastered with that task or performance plateaued. This would have provided a more detailed comparison (i.e., total difference in time to mastery) and would have provided some additional assurance that the first task, once mastered, maintained at that level. Finally, from a design perspective, the multiple opportunity probes appeared to result in a slight accelerating trend for all participants in the control condition. This indicates that repeated exposure of the steps in sequence will result in at least some gradual growth (testing threat; Alexander, Ayres, Shepley, Smith, & Ledford, 2017; Alexander, Smith, Mataras, Shepley, & Ayres, 2015).

Implications for Research

In terms of research on self-instruction, this study moves closer to providing a methodology to teach truly independent self-instruction, in that the participants were taught how to initiate their device, select the video corresponding to the task direction, and play (and pause during VP) videos independent of instructor support. Researchers exploring generalization and self-instruction may consider examining more closely how to eliminate the need for any instructor engagement. For example, evaluating means for self-correction/self-evaluation of steps so that a teacher would not be required to interrupt errors. Additionally, building in means for self-reinforcement or conditioning task completion alone as a reinforcer. To fully manualize a means for self-instruction, more work is required to identify appropriate ways for technology to substitute into these traditional teacher roles.

If researchers can design a self-contained system that prompts, provides corrective feedback, and reinforces, which is also accessible to individuals with disabilities, this would mark a step toward a prosthetic technology that can reshape lives. The ability to pursue one’s own interests and learn what one wants to learn, would increase autonomy for individuals with ID and expand opportunities in leisure, work, and independent living.

Implications for Teaching

In a classroom or therapeutic context, preparing self-instructional materials and teaching learners to control some aspects of their instruction can free teachers or therapists to reallocate their time to other tasks. In a class-
room, students’ independent work time becomes an opportunity where they can instruct themselves and learn new skills rather than only work on fluency or practicing skills that are already partially in their repertoire. Job coaches and therapists can invest less time in teaching specific vocational tasks and instead focus on more nuanced things like social skills.

Teachers can also apply this same methodology to other multi-step tasks that are part of the general education curriculum. For example, a middle school student learning to solve algebraic expressions could, in theory, self-instruct on the steps required to solve the problem by using VSP. This could allow a teacher to structure a session differently if individual students could access the learning supports they needed via technology. The technology exists in the classroom and a great many video-based resources exist online. Vetting these resources and constructing a system to provide these means to students after they learn to self-instruct could help maximize learning time and engagement in schools.

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