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As Published: https://doi.org/10.1007/s41252-018-0075-3

Publisher: Springer International Publishing

Persistent URL: https://hdl.handle.net/1721.1/131482

Version: Author's final manuscript: final author's manuscript post peer review, without publisher's formatting or copy editing

An Exploratory Study of Speech-Language Pathologists Using the Echo Show™ to Deliver Visual Supports

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Abstract

With the burgeoning array of voice-activated, intelligent personal assistants (IPA), repurposing these products for individuals with autism spectrum disorder (ASD) has become increasingly possible. This study aims to determine the feasibility of speech-language pathologists (SLP) delivering hands-free, just-in-time (JIT) visual content via the Echo Show™, a voice-activated IPA with a 7-inch touchscreen that displays graphic content (e.g., photographs, videos, text). The following questions were explored: (1) Can SLPs use a carrier phrase consistently to retrieve visual content on the Echo Show™?, (2) Is the Echo Show™ able to accurately retrieve personalized visual content?, and (3) Do SLPs respond positively to using the Echo Show™ as a potential clinical tool?. Outcomes provide preliminary evidence for the feasibility of SLPs using the Echo Show™ as a potential clinical tool to retrieve personalized visual content. Results will be discussed in terms of clinical implications and use of the Echo Show™ with individuals with ASD.

Keywords: Assistive Technology; Augmentative and Alternative Communication; Autism Spectrum Disorder; Consumer-Level Technologies; Intelligent Personal Assistants; Voice-Activated Technologies; Repurposing; Speech-Language Pathologists

Introduction

Voice-activated, intelligent personal assistants (IPA) (e.g., Alexa, Siri, Google Home) have recently become increasingly popular and accessible. They offer a unique way to control the environment (e.g., music, lights, outlets), gain information (e.g., news, jokes, weather), retrieve media content (e.g., photographs, videos), and support task completion (e.g., requesting ride share services, shopping, reminders). Voice-activated IPA technology is defined as a device and/or program that is accessed via speech to assist individuals with daily tasks. Voice-activated technology has conventionally been used for dictation purposes (e.g., Dragon Speak Naturally), and recently has been extended to more unconventional purposes (e.g., voice-activated phone calls, garage door control).

Because IPAs are a newly available technology, research on their efficacy for general consumers is limited, as is the adaptability or "repurposing" potential to support needs of individuals with disabilities. Despite limited research, forms of consumer technology are often repurposed to support needs of indviduals with disabilities. For example, an iPad may be repurposed as a speech-generating device for those who have limited functional speech. Similarly, an iOS Calendar application may be used as a memory aid for individuals with acquired brain injury (O'Brien et al., 2017). Pradhan, Metha, and Findlander (2018) investigated voice-activated IPAs with individuals with disabilities. These authors reported on the use of the Amazon Echo™ for specific tasks commonly associated with entertainment (e.g., retrieving music) and utility (e.g., gaining weather information), increasing independence with home automation tasks (e.g., controlling lights, smart outlets), and improving safety (e.g., sending emergency alerts). Additionally, Pradhan et al. (2018) reported on unexpected functions of the

Amazon Echo™ to include (a) speech therapy (e.g., to improve speech intelligibility), (b) a learning tool (e.g., to read audio books), and (c) as a memory aid (e.g., reminders, timers).

Many individuals with ASD demonstrated a predilection for using technology and visual supports (Shane & Albert, 2008). Furthermore, individuals with ASD were reported to benefit from visual supports provided within an as needed, or a "just-in-time" (JIT), manner to support directive-following (O'Brien et al., 2016; Schlosser et al., 2017). With the growing array of IPA technologies, repurposing these products as a potential clinical tool for individuals with ASD has become increasingly possible. The ease and accessibility of these commercially available products, particularly voice-activated technology, provides an exciting hands-free capability to deliver visual supports. In addition, it may provide a clinical advantage for clinicians to efficiently present visual content such as picture stimuli in an as needed manner.

Schlosser et al. (2015) offered a taxonomy of JIT supports that classifies augmentative and alternative communication (AAC) supports in terms of (a) intended purpose (e.g., prompts, reminders, rewards, conversation), (b) modalities (e.g., auditory, visual, or vibrotactile), (c) source (e.g., automated, mentor-generated, or self-generated), and (d) delivery method (e.g., face-to-face, wireless transmission, preprogrammed, tele-practice, or self-initiated). Until recently, the delivery methods of visual content required the use of hands to retrieve and send information. These authors proposed that IPAs may be used as a JIT support with the intended purpose of providing prompts in the visual or auditory modality using a mentor-generated, face-to-face, delivery method.

Allen et al. (2017) conducted a three-part study to investigate whether the Amazon Echo™ could function as a speaker-independent device permitting the hands-free retrieval of visual supports for children with ASD via a third-party iPad application. These authors suggested

that at that time, the Amazon Echo,™ in conjunction with a third party application, could not function efficiently as a speaker-independent speech recognition system due to low accuracy in retrieving visual content. The newly available Amazon Echo Show™, however, affords the opportunity to retrieve and send visual content not only in a JIT manner, but also hands-free. In contrast to the Amazon Echo™, the Amazon Echo Show™ is an Alexa enabled device with a touchscreen monitor, eliminating the need for a third party application or device. This newly available technology may have clinical significance and allow a clinician or teacher to further their distance from a learner and possibly reduce the need for a more intrusive prompt. In addition, it could allow a clinician to use their hands for other clinical purposes such as behavioral management, data collection, or manipulation of physical materials.

As a first step in determining the feasibility of repurposing the Echo Show™ as a clinical tool, this study aims to: (1) evaluate the ability of SLPs to properly and consistently use a carrier phrase to retrieve visual content from the Echo Show™; (2) evaluate the accuracy of the Echo Show™ in retrieving visual content via voice-activated command; and (3) evaluate SLP's experience and satisfaction with the Echo Show™ for retrieving visual content.

Method

Participants. Participants included five SLPs with an age range from 24 to 40 years old, based in an outpatient pediatric hospital (see Table 1). Inclusion criteria for the participants included: (a) an active ASHA Certificate of Clinical Competence for Speech-Language Pathologists (CCC-SLP), (b) full-time status, and (c) demonstrated ability to read a script to activate the Echo Show™ in a screening task with 100 % accuracy. One participant was randomly selected in each of the six clinical programs within the Center for Communication Enhancement (CEC) at Boston Children's Hospital (BCH). Table 1 provides an overview of participant characteristics.

Setting. The study was performed in a clinical treatment room within an outpatient hospital in Boston, MA, U.S.A. A licensed SLP with two years of clinical experience served as the experimenter. Additionally, a second licensed SLP, with three years of clinical experience, served as the independent observer. Each participant was seated in the clinical treatment room at a table with the experimenter. The Echo Show™ was positioned on the table three feet from the participant. The independent observer was seated to the side of the participant. The position of the device remained consistent across participants.

Materials. Materials included an (a) Echo Show™ and (b) 25 photographs from Google Images™ representing 25 common objects and/or short action phrases. The Echo Show™ (size: 7.4" x 7.4" x 3.5"; touchscreen: 7"; color: white) was used as the voice-activated technology to deliver the visual content. In order to prepare the stimuli (i.e., visual content on the Echo Show™), the experimenter uploaded 25 photographs from Google images into a personalized Amazon Photos™ account, which automatically syncs to the Echo Show™. The "Find People, Places, and Things" setting, an image recognition feature that automatically tags photos by keyword, was enabled. The clinician then uploaded each image into separate albums and created a unique name corresponding to each photograph. For example, an image of a person sitting down was placed into a photo album and subsequently named "sit down".

Design and Measures.

Two dependent variables were monitored in this study: (a) reading/recall accuracy, and (b) retrieval accuracy. During Experimental Task 1, reading accuracy was defined as the accuracy of the participant reading each phrase aloud; a response was considered correct if each word in the sentence was read in left-to-right sequence without repetition or mispronounciation of any word. During Experimental Task 2, the participant was provided with a list of single words and

phrases. Recall accuracy was defined as the participant remembering each word in the carrier phrase in sequence and adding the target word/phrase from the written list. A reading/recall accuracy percentage was derived by counting the number of sentences read/recalled correctly divided by the the total number of sentences read/recalled multiplied by 100. In both tasks, retrieval accuracy was defined as the Echo Show™ retrieving the exact visual corresponding to the voice command stated by the clinician. For example, the response was considered correct if the Echo Show™ retrieved the photograph of a door closed following the participant saying, "Alexa, show me my photo album of shut the door." Again, we calculated a retrieval accuracy percentage.

Procedures.

Screening Task and Pre-Survey

A screening task was administered to each participant to determine study inclusion. Each potential participant was provided with a common phrase typed on a sheet of paper used to activate the Echo Show™ (i.e., "Alexa, what is the weather?"). Each participant was then asked to read the phrase aloud. All five potential participants passed the screening. Following successful completion of the screening task, each participant was asked to complete a pre-survey consisting of ten questions related to demographic information and previous experience with using technology.

Experimental Task 1: Retrieving visual content

The five SLPs were then provided a written script of the commands used to retrieve visual content from the Echo Show™. The script included thirteen sentences with a consistent starter/carrier phrase ("Alexa, show me my photo album of ___") followed by novel vocabulary (e.g., "sandwich") to retrieve different personalized visual content from the Echo Show™.

Vocabulary selected included three 1-syllable words, three 2-syllable words, three 3-syllable words, and four short phrases (see Table 2). Of note, originally when selecting the short phrases, the Echo Show™ did not retrieve the visual for "close the door," but instead required the phrase "shut the door." The order of the sentences was randomized once and then applied in the same order to all participants. The participants were informed they would be asked to recall the carrier phrase with alternative single words and short phrases in order to retrieve novel, visual content. The experimenter and independent observer monitored participant and Echo Show™ accuracy by observing the participants' reading the script aloud (i.e., inclusion of starter phrase, inclusion of novel vocabulary) and monitoring whether the Echo Show™ retrieved the accurate visual support.

Experimental Task 2: Using the carrier phrase from memory with novel vocabulary

Following the previous task, the script was removed and replaced with a list of three 1-syllable words, three 2-syllable words, three 3-syllable words, and three short phrases (see Table 3). Each participant was then asked to insert the single words and short phrases into the carrier phrase learned in the previous task from memory (e.g., "Alexa, show me my photo album of ___"). The order of the single words and phrases were randomized once and applied consistently across participants. The experimenter and independent observer, again, monitored the accuracy of the participants reading the script aloud (i.e., inclusion of starter phrase, inclusion of novel vocabulary) and whether the Echo Show™ retrieved the accurate visual support.

Post Survey

Following the use of the Echo Show™ to retrieve novel visual content, each participant was asked to complete a post-survey consisting of ten questions related to their experience and satisfaction in using the Echo Show™. This survey was adapted from the Treatment Evaluation

Inventory Short Form (TEI-SF) (Kelley, Heffer, Gresham, & Elliott, 1989) based on item relevance to acceptance of procedures. Four questions were derived from the TEI-SF and modified accordingly. Out of the ten questions, eight questions were constructed with a 5-point scale and two questions were open ended (see Table 4). For the eight 5-point scale questions of the survey, the items were scored using a 5-point Likert scale, with a score of 1 indicating 'strongly disagree' and a score of 5 indicating 'strongly agree'.

Results

Screening and Pre-survey

All participants passed the screening to accurately read the common phrase to activate the Echo Show™. Subsequently, all five participants completed the pre-survey related to demographics and previous experience in technology. Participants reported on frequency of personal assistant technology use and voice dictation technology use. Results on frequency of personal assistant technology use ranged from 'seldom' to 'always,' while frequency of voice dictation use ranged from 'never' to 'often' (see Table 5). Participants were also asked to report on the type of personal assistant technology used, such as Alexa, Siri, and Google Assistant. All five participants reported on previously having experience with Siri, an Apple based personal assistant, while three participants reported previous experience with Alexa, an Amazon based personal assistant, and one participant reported previous experience with Google Assistant (see Table 6). The Echo Show™ was a novel tool for all participatants.

Experimental Task 1

Participants were asked to read 13 commands. Results indicated the reading accuracy ranged from 92% to 100%. Specifically, four of five participants read 13 out of 13 commands accurately (100%), while one participant read 12 of 13 commands accurately (92%). Retrieval

accuracy ranged from 77% to 92% accurate across participants (see Table 7). It should be noted that the Echo Show™ was unable to accurately retrieve the command "Alexa, show me my photo album of close the door" in zero of five trials (0%). After the prompt was rephrased to "Alexa, show me my photo album of shut the door," the Echo Show™ accurately retrieved the visual content in five of five times (100%) (see Table 8).

Experimental Task 2

Participants were provided with a list of single words and short phrases that they were required to insert into the previously learned carrier phrase "Alexa, show me my photo album of ___". Results ranged from 92% to 100% recall accuracy. Three of five participants recalled the carrier phrase and included the novel vocabulary in 12 of 12 commands accurately (100%), while two of five participants recalled the carrier phrase and included the novel vocabulary in 11 of 12 commands accurately (92%). Retrieval accuracy for the Echo Show™ ranged from 75% to 92% across participants (see Table 9). Notably, the lowest retrieval accuracy percentages were for "saw" (0/5 = 0%) and "spatula" (3/5 = 80%) (see Table 10).

Post-survey

All five participants completed the post-survey related to their experience and satisfaction with using the Echo Show™ to retrieve visual content. Results from the post-survey provide preliminary information on SLPs experience and satisfaction in using the Echo Show™. In general, responses to using the Echo Show™ ranged from 'neutral' to 'strongly agree' (see Table 11). In addition to scaled response items, the post-survey included two open-response items, which are explored in the "Discussion" section.

Inter-Observer Agreement.

Inter-observer agreement (IOA) data were collected for all five participants by counting the number of agreements divided by agreements plus disagreements, multiplied by 100. The IOA was 100%.

Discussion

The results of this two-phase study provide preliminary evidence for the feasibility of SLPs using the Echo Show™ as a potential clinical tool to retrieve personalized visual content. Given these preliminary findings, further exploration of the feasibility of using the Echo Show™ as a clinical and/or therapeutic tool for individuals with ASD is warranted.

Results from the pre-survey suggest prior experience, or lack of experience, in using voice dictation technology or IPA, particularly the Echo Show, does not lead to increased accuracy in retrieving visual content. These findings provide preliminary support that SLPs with varying experiences in technology may potentially interact with the Echo Show™ via voice to retrieve personalized visual content.

In the Experimental Task 1, the Echo Show™ accuracy in retrieving visual content remained high across all participants with the exception for participant 2. Notably, participant 2 was wearing an orthodontic appliance (i.e., bottom retainer) that may have impacted the accuracy of the Echo Show™ in retrieving accurate visual content. In addition, it should be noted that participant 2 anecdotally reported nervousness about the experimental task.

Results also provide preliminary evidence suggesting that number of syllables or phrase length does not impact accuracy of the Echo Show™ in retrieving the corresponding visual content. Instead, accuracy of retrieval is word/phrase dependent. For example, the phrase “close the door” was not understood across all five participants by the Echo Show. However, a “workaround” strategy of renaming the intended graphic image with a synonymous phrase (i.e.,

"shut the door") yielded 100% accuracy. This suggests that while some words and/or phrases may not accurately be understood by the Echo Show, alternative phrasing may increase accuracy. Informally, the examiner attempted to say the phrase with multiple pronunciations and retrieved the accurate visual content when the phrase was pronounced as "/klos/ the door." This informal finding suggests that in certain instances saving the title of the graphic content phonetically (e.g., 'cloze the door') may improve accurcy.

In Experimental Task 2, participants were only provided with the vocabulary for the visual content and not provided the carrier phrase. Results of this portion provide preliminary evidence that SLPs remembered the carrier phrase needed to retrieve personalized visual content given prior experience. It should be noted that accuracy decreased among two participants due to inaccurately reading or pronouncing the vocabulary versus recalling the carrier phrase. Of interest, the Echo Show™ demonstrated reduced accuracy of retrieving visual content for participants 2 and 5. Again, participant 2's orthodontic appliance (i.e., bottom retainer) and reported apprehension may have contributed to this finding. Participant 5 reported a self-diagnosis of laryngitis resulting in perceptual qualities of reduced loudness and hoarseness that too may have impacted the accuracy of the Echo Show™ in retrieving corresponding visual content. Interestingly, in all three inaccurate trials of the Echo Show™ realted to participant 5, the Echo Show™ did not initially hear the prompt (i.e., "Alexa…"), resulting in Participant 5 repeating the commands with increased loudness. In all three repeated instances, the Echo Show™ was activated.

Results from Experimental Task 2 supported findings from the first task that number of syllables or phrase length does not impact accuracy of the Echo Show™ in retrieving corresponding visual content, but instead is word/phrase dependent. Specifically, the word "saw"

was not understood by the Echo Show™ across all five participants and, interestingly, the Echo Show™ consistently retrieved the graphic image of 'soccer' instead. This provides clinical implications to those creating and naming personalized visual content that words with similar initial phonemes may not be accurately recognized by the Echo Show™. Additionally, dialectical differences may contribute to reduced accuracy of Echo Show™ image retrieval.

Finally, participants were asked to describe their experience and satisfaction with use of the Echo Show. Overall, all five participants responded positively to use of the Echo Show™ as a hands-free way of retrieving and delivering visual supports. When asked how the Echo Show™ might be used in their own clinical practice, two responded positively. One reported "*JIT supports- hands free access to visual when in sessions and hands are busy,*" while another reported, "*I might use the Echo Show™ to work with patients who would benefit from visual supports*." Two other participants responded less favorably and reported, "*Not now. If interactive, I could use it during feeding therapy,*" and "*Maybe in delivering picture stimuli for voice therapy to target words, probably not though*." Participants were also asked to describe any concerns with use and/or implementation of the Echo Show™. Specific concerns included (a) the small size of the photographs displayed on the Echo Show™ screen; (b) potential difficulty of the Echo Show™ understanding individuals with reduced speech intelligibility; and (c) feasibility of children being able to remember specific prompts. These concerns warrant further exploration of the feasibility of using the Echo Show™ as a clinical tool for practitioners working with individuals with ASD.

Limitations of this study include a limited number of participants, resulting in a disproportionate population in terms of gender (i.e., all female). Of note, females currently represent 95.3% of SLPs and males 4.7% of SLPs within the American Speech and Hearing

Association (ASHA) (ASHA, 2017). Second, the Echo Show™ was introduced within a quiet room, rather than within a natural clinical or classroom environment where background noise may interfere with performance. Nevertheless, the initial success of this two-task study provide preliminary evidence for the feasibility of SLPs using the Echo Show™ as a potential clinical tool to retrieve personalized visual content. This may provide unique opportunities in which the Echo Show™ is used as a clinical and/or therapeutic tool during speech therapy or in the classroom (e.g., to support therapy targeting articulation, wh-questions, turn taking, increasing independence, and directive following). We propose future research that examines the use of the Echo Show™ with individuals with ASD.

Conflict of Interest Statement: The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

Ethics Approval: Appropriate institutional approval and written informed consent were obtained for the study. All procedures performed were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Acknowledgements

The authors gratefully acknowledge the participants for their contributions to the study.

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Table 1

Participant Characteristics

Participant	Age (years)	Gender	Years practicing as an SLP[a]	Years working with individuals with ASD[b]
1	32	F	6-10 years	6-10 years
2	30	F	< 2 years	6-10 years
3	24	F	< 2 years	< 1 year
4	28	F	< 2 years	2-5 years
5	40	F	> 11 years	> 11 years

Notes. [a] speech-language pathologist. [b]Autism Spectrum Disorder

Table 2

Echo Show™ Commands involving a Carrier Phrase plus One-to-Three Syllable Words or Phrases

Carrier phrase plus one syllable words
Alexa, show me my photo album of *car*
Alexa, show me my photo album of *doll*
Alexa, show me my photo album of *sun*
Carrier phrase plus two syllable words
Alexa, show me my photo album of *bubble*
Alexa, show me my photo album of *sandwich*
Alexa, show me my photo album of *towel*
Carrier phrase plus three syllable words
Alexa, show me my photo album of *basketball*
Alexa, show me my photo album of *spaghetti*
Alexa, show me my photo album of *ladybug*
Carrier phrase plus phrases
Alexa, show me my photo album of *sit down*
Alexa, show me my photo album of *put the juice away*
Alexa, show me my photo album of *close the door*
Alexa, show me my photo album of *shut the door*

Table 3

Phase Two Echo Show™ Vocabulary

One syllable words
Cat
Dog
Saw
Two syllable words
Balloon
Soccer
Tiger
Three syllable words
Bicycle
Spatula
Lollipop
Phrases
Stand up
Clap your hands
Put your jacket on

Table 4

Post-survey questionnaire

5-point Likert Scale Questions
I find the Echo Show™ to be an acceptable way of delivering visual supports.
I would be willing to use the Echo Show™ to deliver visual supports to individuals with ASD.
I found the Echo Show™ to provide an efficient way in delivering visual supports.
I like the procedures used to deliver visual supports via the Echo Show.
I would be willing to learn how to customize (e.g., program and create my own materials) the Echo Show™ for clinical purposes.
I believe the Echo Show™ could be used to deliver visual supports at a distance to individuals with ASD to increase independence.
I believe the Echo Show™ offered me a hands-free way of delivering visual supports.
Overall, I have a positive reaction to use of the Echo Show™ to deliver visual supports.
Open Ended Questions
How might you use the Echo Show™ in clinical practice?
Do you have concerns with use and and/or implementation of the Echo Show™?

Table 5

Frequency of Use of Personal Assistant and Voice Dictation Technology across Participants

Participant	Personal Assistant Technology	Voice Dictation Technology
1	Always	Seldom
2	Often	Seldom
3	Seldom	Never
4	Seldom	Often
5	Often	Often

Table 6

Types of Personal Assistant Technology Experience across Participants

Participant	Alexa	Siri	Google Assistant	Other
1	X	X	X	
2	X	X		
3		X		
4		X		
5	X	X		

Table 7

Reading and Retrieval Accuracy Percentages across Participants in Experimental Task 1

Participant	Reading accuracy	Retrieval accuracy
1	13/13 (100%)	12/13 (92%)
2	12/13 (92%)	10/13 (77%)*
3	13/13 (100%)	12/13 (92%)
4	13/13 (100%)	12/13 (92%)
5	13/13 (100%)	12/13 (92%)

Table 8

Retrieval Accuracy based upon Word and/or Phrase in Experimental Task 1.

Length	Word	Echo Show™ Retrieval Accuracy
One syllable	Car	5/5 (100%)
	Doll	5/5 (100%)
	Sun	5/5 (100%)
Two syllables	bubble	4/5 (80%)*
	sandwich	5/5 (100%)
	towel	4/5 (80%)*
Three syllables	basketball	5/5 (100%)
	ladybug	5/5 (100%)
	spaghetti	5/5 (100%)
Phrase length	close the door	0/5 (0%)
	put the juice away	5/5 (100%)
	shut the door	5/5 (100%)
	sit down	5/5 (100%)

Note. * Both errors were made by Participant 2.

Table 9

Accuracy of Participants in recalling Echo Show™ Carrier Phrase and Accuracy of Echo Show™ in retrieving corresponding Visual Content

Participant	Participant Recall Accuracy	Echo Show™ Recognition Accuracy
1	12/12 (100%)	10/12 (83%)
2	11/12 (92%)	9/12 (75%)
3	12/12 (100%)	11/12 (92%)
4	11/12 (92%)	11/12 (92%)
5	12/12 (100%)	9/12 (75%)

Table 10

Accuracy of Echo Show™ in retrieving Visual Content based on Word and/or Phrase in Phase 2

Length	Word	Echo Show™ Recognition Accuracy
One syllable	Cat	4/5 (80%)
	Dog	5/5 (100%)
	Saw	0/5 (0%)
Two syllables	balloon	4/5 (80%)
	soccer	5/5 (100%)
	Tiger	5/5 (100%)
Three syllables	Bicycle	5/5 (100%)
	Lollipop	5/5 (100%)
	spatula	3/5 (60%)
Phrase length	clap your hands	5/5 (100%)
	stand up	5/5 (100%)
	put your jacket on	5/5 (100%)

Table 11

Post-survey Results on Experience and Satisfaction with using the Echo Show™ among Speech-Language Pathologists

Item	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I find the Echo Show™ to be an acceptable way of delivering visual supports.*	0/0 (0%)	0/0 (0%)	1/5 (20%)	1/5 (20%)	3/5 (60%)
I would be willing to use the Echo Show™ to deliver visual supports to individuals with ASD.*	0/0 (0%)	0/0 (0%)	0/0 (0%)	2/5 (40%)	3/5 (60%)
I found the Echo Show™ to provide an efficient way in delivering visual supports.	0/0 (0%)	0/0 (0%)	0/0 (0%)	1/5 (20%)	4/5 (80%)
I like the procedures used to deliver visual supports via the Echo Show™.*	0/0 (0%)	0/0 (0%)	0/0 (0%)	3/5 (60%)	2/5 (40%)
I would be willing to learn how to customize (e.g., program and create my own materials) the Echo Show™ for clinical purposes.	0/0 (0%)	0/0 (0%)	0/0 (0%)	1/5 (20%)	4/5 (80%)
I believe the Echo Show™ could	0/0 (0%)	0/0 (0%)	1/5 (20%)	2/5 (40%)	2/5 (40%)

be used to deliver visual supports at a distance to individuals with ASD to increase independence.					
I believe the Echo Show™ offered me a hands-free way of delivering visual supports.	0/0 (0%)	0/0 (0%)	0/0 (0%)	1/5 (20%)	4/5 (80%)
Overall, I have a positive reaction to use of the Echo Show™ to deliver visual supports. *	0/0 (0%)	0/0 (0%)	0/0 (0%)	1/5 (20%)	4/5 (80%)

Note. * items that have been adapted from the TEI-SF