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Evaluating the Usability of Virtual Interview Training for Transition-Age Youth with Visual Impairments

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Abstract

Interventions focused on job search skills and employment preparation for transition-age youth with visual impairments include content on interviewing but limited opportunities to practice via role-playing or mock interviews. Virtual interviewing simulations are cost-effective and can be implemented in various settings, allowing transition-age youth with visual impairments to practice job interview training. Our goal was to evaluate the usability of a virtual interview training simulation and identify ways to improve accessibility and user experiences for transition-age youth with visual impairments. Ten transition-age youth aged 17 to 25 participated in remote moderated usability sessions. Researchers evaluated usability with the System Usability Scale, open-ended questions about the participant's experience, task success rates, and task completion times. Our findings show that participants rated the virtual interview training's usability highly and were satisfied with the product overall. Findings also provide insight into conducting remote moderated usability studies with people with visual impairments.

Evaluating the Usability of Virtual Interview Training for Transition-Age Youth with Visual Impairments

Introduction

Approximately 304,300 youth, ages 16 to 20 years, have a visual impairment in the United States (Erickson et al., 2024). The term "visual impairment" encompasses a spectrum of vision conditions and varying amounts of functional vision, ranging from low vision to total blindness. In the U.S. education system, visual impairment (including blindness) is defined broadly as "an impairment in vision that, even with correction, adversely affects a child's educational performance" in the Individuals with Disabilities Education Improvement Act (IDEA, 2004). Visual impairment affects children's ability to develop concepts and skills incidentally through visual observation, often leading to gaps in knowledge in numerous domains, such as career education and social interaction skills (Hatlen, 1996; Sapp & Hatlen, 2010). To address these gaps and facilitate their transition to postschool adult life, many transition-age youth with visual impairments receive a plethora of services under IDEA and the Workforce Innovation and Opportunity Act (WIOA, 2014). Despite these federally-mandated services, transition-age youth with visual impairments have lower postschool employment rates than their sighted peers (McDonnall, 2010). Several predictors and correlates of employment have been documented for transition-age youth with visual impairments (Lund & Cmar, 2020), but interventions that result in better employment outcomes for these youth are absent from the literature (Cavenaugh & Giesen, 2012; Elsman et al., 2019).

Interviewing is critical for successful job-seeking and requires numerous skills, such as self-presentation, self-monitoring, and verbal and non-verbal communication (Huffcutt, 2011). People with disabilities have additional factors to consider when preparing for interviews,

including disclosure and accommodations. Moreover, many transition-age youth with disabilities need direct instruction in interview skills, especially responding to open-ended questions, identifying transferable skills and appropriate examples, and delivering responses effectively (Lindsay et al., 2015; Lindsay & DePape, 2015). These skills are particularly relevant for youth with visual impairments, as many have difficulty interpreting non-visual social cues (Lewis et al., 2014), lack job-seeking experience (Cmar & Steverson, 2021), and have limited paid work experiences (Lipscomb et al., 2017). However, intervention research targeting job interview skills for this population is limited to two older, small-scale studies of social skills and assertiveness training (Howze, 1987, 1990). Job-seeking interventions and employment preparation programs for transition-age youth with visual impairments may include some content on interviewing (Cmar & McDonnall, 2020; National Research and Training Center on Blindness and Low Vision, 2021) but typically provide few, if any, opportunities to practice through role-playing or mock interviews. These common interview training methods are time-consuming and resource-intensive to implement (Bell & Weinstein, 2011; Smith et al., 2020) and may not provide sufficient repetition for youth to develop interview competence.

Technology-based interventions such as augmented reality, virtual reality, and virtual simulations can support learning and rehabilitation for people with disabilities (Carreon et al., 2022; Michalski et al., 2021), including visual impairment (Hamash et al., 2024; Kasowski et al., 2023). Virtual interview training interventions have evidence of feasibility and effectiveness among various disability populations (Burke et al., 2021; Smith et al., 2021, 2022; Walker et al., 2019; Williams & Smith, 2023), but previous virtual interview training studies have not included participants with visual impairments. These interventions have advantages over traditional interview training methods, including opportunities for repeated practice in safe, realistic

environments and objective performance feedback (E. Baker & Jenney, 2023; Blajeski et al., 2023). Moreover, virtual simulations that run on computers and other ubiquitous devices are cost-effective and can be implemented in various settings without extensive staff resources (Danielson et al., 2024; Smith et al., 2020). Given these advantages, virtual simulations may be a promising approach to job interview training for transition-age youth with visual impairments.

One such example of a virtual simulation is *Virtual Interview Training for Transition-Age Youth* (VIT-TAY; Smith et al., 2020). Developed by SIMmersion, LLC in partnership with the University of Michigan, VIT-TAY offers trainees a comprehensive platform to practice job interviews at a fictional company, "Wondersmart." Before participating in the simulated interviews, trainees engage with self-guided e-learning materials that cover the entire job interview process, from preparation to follow-up. These materials include a video-based review of 10 job interview skills. Trainees also fill out an online job application for one of 14 positions (e.g., cashier, customer service, food services, or web developer), which shapes their virtual interview experience.

The VIT-TAY system features a computerized job interview simulator accessible via the Internet. This simulator includes virtual interviewers with actors in the roles of Ms. Rita Muniz and Mr. Travis Bishop, who offer a realistic remote meeting interview. After Rita or Travis asks a question, trainees select their response from a range of choices that can help or hurt their rapport and likelihood of getting the job. Trainees speak these responses out loud and can also choose from several options to redirect the conversation to address their specific needs, such as disclosing a disability.

Incorporating scaffolding strategies, VIT-TAY progresses through three levels of interview difficulty: easy (Level 1), medium (Level 2), and hard (Level 3). The *easy* level

focuses on four skills: confidence, positivity, professionalism, and job interest, answering whether the trainee is someone an employer would want to work with. The *medium* level adds honesty, dependability, and teamwork, assessing if the trainee would be a good worker. The *hard* level incorporates all previous skills and adds sharing strengths, past experiences, and limitations, determining if the trainee would do a good job. These skills were chosen based on job interview literature (Huffcutt, 2011) and developed with input from disability stakeholders.

VIT-TAY provides four levels of feedback. The first level involves real-time feedback from an on-screen virtual help coach named Kendra, who uses non-verbal cues to highlight successful responses and mistakes. The second level features a color-coded transcript explaining the effectiveness of specific responses. The third level involves a score out of 100 points generated by the VIT-TAY algorithm, reflecting performance across the 10 job interview skills. The fourth level offers a qualitative performance assessment from Kendra via video and text, reviewing each skill across the three levels of interview difficulty.

Additionally, VIT-TAY includes supplemental training materials: Kendra, the virtual help coach, guides the experience and offers optional voiceovers for all written content within a social story framework, and a token reward system enhances the social storytelling approach. More than 300 transition-age youth with various disabilities (e.g., specific learning disability, autism) self-reported VIT-TAY as highly usable (Smith et al., 2022).

The features of VIT-TAY and evidence of effectiveness for transition-age youth with non-visual disabilities (Smith et al., 2021, 2022) suggest the potential value of this intervention for youth with visual impairments, but no research to date has evaluated VIT-TAY with this population. Therefore, our team conducted a 5-year research project with the goals of adapting

VIT-TAY, assessing its usability, and investigating its effectiveness for transition-age youth with visual impairments.

The first phase of this project involved adapting VIT-TAY's content and interface for transition-age youth with visual impairments. The researchers (i.e., the first two authors) and three stakeholders (i.e., adults with visual impairments employed in the blindness rehabilitation field) reviewed each section of the e-learning materials, provided suggestions for improving its relevance for youth with visual impairments, and identified additional topics to address. Then, the researchers presented the proposed changes to the VIT-TAY development team (i.e., the third and fourth authors) and worked with SIMmersion, LLC to implement the changes. Following the Stirman coding taxonomy that supports adapting interventions (Stirman et al., 2013), the adaptations included adding new content (e.g., videoconferencing for interviews) and tailoring the information (e.g., restructuring the content flow) to meet the needs of transition-age youth with visual impairment. Supplemental Table 1 contains more details about the content adaptations.

This article focuses on the second phase of the project, a usability study of the adapted product. The study's aim was to evaluate the usability of VIT-TAY among transition-age youth with visual impairments and identify ways to improve accessibility and user experience for these youth. For this study, we used the International Organisation for Standardisation's definition of usability: "the extent to which a system, product or service can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use" (International Organisation for Standardisation, 2018). Considering that youth with visual impairments often encounter usability problems when using assistive technology (AT) to access web-based educational materials, and these problems interfere with learning (C. M. Baker et al.,

2019), conducting usability testing with our target population is a critical step. Findings from this study provide insight into how youth with visual impairments interact with a virtual simulation and strategies for conducting usability studies with this population.

Materials and Methods

Participants

To be eligible for the study, participants had to be transition-age youth between the ages of 16 and 26 years, have a visual impairment, use a screen reader or screen magnification, be fluent in English at a 4th-grade reading level or higher, have access to a computer with a high-speed Internet connection, and have experience using a computer to access the Internet. The final sample included 10 transition-age youth with visual impairments. Most participants were white (n = 6, 60%), and half were female (n = 5, 50%). Participants were from nine U.S. states. Participants' average age was 20.90 years (SD = 2.85), and their ages ranged from 17 to 25 years. Six participants were still in school (three in high school and three in college), three were not enrolled in school, and one was enrolled in a vocational rehabilitation program. Six participants used screen readers and four used screen magnification software. On a scale from 1 (*beginner*) to 10 (*advanced*), participants self-rated their Internet navigation and AT skills as M = 7.50 (SD = 1.90) and M = 7.10 (SD = 1.52), respectively. See Tables 1 and 2 for additional participant demographics and the technology and browsers used for the usability sessions.

Procedure

The Institutional Review Board at [masked for blind review] reviewed this study and determined it was not human subjects research; therefore, it did not require oversight, but best practices were followed when conducting the study. The researchers utilized various methods to recruit participants, including a national registry, former workshop and research participants, a

national advisory council, various listservs, personal contacts, and social media. Individuals interested in participating in the study completed a prescreening survey to determine eligibility. The researchers provided contact and study information to eligible participants and explained that participation was voluntary. Participants provided their consent to participate, which included allowing the researchers to video and audio record the usability sessions.

Due to safety protocols resulting from the coronavirus pandemic, the researchers conducted remote moderated usability sessions. The researchers sought guidance from American Foundation for the Blind (AFB) Consulting on best practices for conducting remote usability sessions with people with visual impairments. The protocol for assessing the usability of the adapted product was created using an iterative process. The researchers consulted with the VIT-TAY development team and SIMmersion to determine the parts of the product (i.e., completing a virtual interview, accessing the learning goals video, and accessing the e-learning content) that were most important to test with the transition-age youth. Then, the researchers selected the specific tasks and created corresponding scenarios to test the identified parts of the product using a think-aloud protocol to gain insight into participants' behaviors and thoughts as they completed the usability tasks (Cooke, 2010). The protocol was pilot-tested with two sighted adults and one adult with visual impairment to revise the usability tasks and estimate task completion times.

The adult with visual impairment identified some usability issues with a screen reader during the pilot test. The researchers shared the usability issues with SIMmersion’s development team to identify solutions and then worked with them to implement and test the solutions. SIMmersion’s development team included a full-stack software developer, a content developer with basic programming skills, and a quality-assurance analyst with basic screen reader proficiency. A final pilot test was conducted with another adult with visual impairment to

finalize the solutions to the previously identified usability issues and the think-aloud protocol. Table 3 provides the final scenarios and 10 tasks included in the protocol. Changes to the product included optimizing the table of contents for faster screen reader navigation, changing the closed captions default to “off” to prevent screen readers from reading the captions over the video audio, and recoding all onscreen buttons so screen readers identified them as buttons rather than links.

The researchers used Zoom, a videoconferencing platform, to conduct the remote moderated usability sessions between March 2022 and April 2022; each session lasted between 1 and 2 hours. Each participant was offered a pre-session for orientation to Zoom, but no participants used it. The researchers emailed participants a Word document of the tasks before the usability sessions to review and refer to if needed. The researchers recorded the participants' screen and system sounds during the sessions to capture the screen reader and VIT-TAY sounds, and they took field notes to document potential usability issues and summarize participant feedback. Participants accessed VIT-TAY via SIMmersion’s online learning management system, the *Training Center* (https://training.simmersion.com). The researchers provided the following instructions to participants:

> When using the product, try to act as naturally as possible. We get that it’s hard to do that with us watching your screen. But please try to act like you are using it on your own, without anyone watching. Try to think out loud when you use the product. We really want to hear your thoughts, like what you are trying to do, why you’re clicking somewhere, what keystrokes you’re using, that sort of thing.

Participants chose their preferred Internet browser and logged into the Training Center using a unique username and password created without any personally identifiable data. Once logged in,

participants could begin VIT-TAY, learn more about the program, resume a prior session, review their past scores and transcripts, and review their product license. In addition to the usability improvements described above, both the Training Center and VIT-TAY were previously certified accessible using Web Content Accessibility Guidelines (WCAG) 2.0 AA (Allan et al., 2015) by an independent contractor using analysts with visual impairments. Each participant received a $35 electronic gift card for their participation.

Measures

The first author verbally administered a *background questionnaire* to each participant at the beginning of the usability session to collect participant demographics and self-reported Internet navigation and AT skills. During the usability session, the researchers measured effectiveness by documenting “yes” or “no” based on the participant's ability to complete each task without prompts. Efficiency was measured by the researchers documenting the start and stop times for each task to calculate the task completion time. Usability issues identified by participants also measured effectiveness or efficiency depending on the issue. At the end of each usability session, the researchers verbally administered a *user experience survey* to assess the participants' satisfaction and experiences with VIT-TAY. The *user experience survey* consisted of Brooke's (1996) System Usability Scale (SUS) and four open-ended questions about the product. The SUS is a standardized 10-item Likert-scale measure of perceived usability. A sample item from the SUS is "I found the various functions in this product were well integrated." (1 = *strongly disagree*, 5 = *strongly agree*). Across multiple samples and products, the SUS has shown evidence of construct validity (Bangor et al., 2008), concurrent validity (Bangor et al., 2009), and internal consistency reliability (Bangor et al., 2008; Sauro, 2011). Using Brooke's (1996) scoring instructions, the researchers calculated total scores, with potential values ranging

from 0 to 100 and higher values being more positive. Based on 446 studies, the average SUS score is 68, so scores above 68 are considered above average (Sauro & Lewis, 2012). The four open-ended questions included (1) What do you think of the product overall?, (2) Would you recommend this product to other youth or young adults with visual impairments? (Why or why not?), (3) Do you think you'll continue to use this product? (Why or why not?), and (4) Are there any barriers that would prevent you from using this product?

Data Analysis

SAS 9.4 was used to generate descriptive statistics (i.e., frequencies and means) for participant demographics and the SUS scores. Transcripts of the usability session recordings were generated using Microsoft Word and Canvas, an online learning management system, and edited by the researchers for accuracy. The researchers reviewed the transcripts, videos, and field notes to identify usability issues. Rosemberg's (2017) Usability Testing Management spreadsheet was used to input task completion (1 = *yes*, 0 = *no*), task completion times, and usability issues. Task success rates and the overall success rate were calculated by summating the number of participants who successfully completed a task and dividing by the total number of participants, and the sum of the task success rates divided by the total number of tasks, respectively. The researchers organized the usability issues into the following categories as defined by Rosemberg (2017): *suggestion* (i.e., potential enhancement or fix in the system with low importance to the participant), *strong suggestion* (i.e., fix something that clearly annoys the participant), *minor issue* (i.e., participant stops to think, but proceeds), *major issue* (i.e., participant faces a significant delay or uses trial-and-error), or *blocker issue* (i.e., participant gets stuck and only proceeds with help). They coded the four most complex usability sessions together to promote consistency in classifying issues into the defined categories, independently coded the remaining

six sessions, and met to resolve any disagreements. Then, the researchers summated the number of participants who identified each usability issue and then prioritized the issues based on the importance of the element, type of issue (i.e., category), and number of occurrences (i.e., how many participants experienced it).

A thematic analysis was conducted on the open-ended questions by the researchers. A coding scheme was agreed upon, and then the researchers independently coded the responses for each question. The codes for each question were compared, and the researchers discussed any disagreement until they reached agreement.

Results

Task Success Rates and Completion Times

All participants attempted all 10 tasks. Four participants (40%) completed all tasks without assistance, whereas six participants (60%) had difficulty with one or more tasks and required prompts to complete them. Task success rates ranged from 60% for finding a disclosure example to 100% for exploring the home screen (Table 3). The overall average task success rate across all participants and tasks was 83%. Average task completion times ranged from 0.44 minutes for playing the results video to 20.96 minutes for completing an interview (Table 3). Supplemental Figures 1a and 1b contain violin plots of the completion times for each task.

Usability Issues

The total number of usability issues identified during the study was 49. Most issues fell into the categories of suggestions (n = 20, 41%) or minor issues (n = 18, 37%), followed by major issues (n = 6, 12%), blocker issues (n = 3, 6%), and strong suggestions (n = 2, 4%). Table 4 provides an overview of the key issues and suggestions by priority level. This information was shared with SIMmersion's development team to identify solutions.

User Experience

Perceived Usability

Across participants, SUS scores ranged from 55 to 95. The mean SUS score was 79.50 (*SD* = 11.47), which falls into the "above average" category. Supplemental Table 2 provides the participants' responses for each SUS item.

Overall Thoughts

Participants' overall thoughts about VIT-TAY were predominantly positive. Most participants indicated that they found the product useful (*n* = 6, 60%); several mentioned particularly beneficial aspects, including its relevance and realistic elements (e.g., videos, response options). One participant stated:

> [I]t got me mentally prepared for what an interviewer's going to ask me when I go out to look for a job. So that way I'm not scared out of my mind. And I like the videos because it had like real people in it, real figures in it. And it wasn't like any of that little kid animated stuff. So, …I was able to connect to it because it was like real life.

Half of the participants (*n* = 5, 50%) described VIT-TAY as easy to use (e.g., user-friendly, well-labeled, easy to navigate, easy to follow, consistent). Other responses focused on the product's accessibility (*n* = 2, 20%). For example, one participant commented on the font and color scheme:

> The font was nice and large. The font that was chosen was a very readable font. There [were] no unnecessary, awkward characters. There was no Serif. And it was just really nice and easy to read. All of the hyperlinks stood out very well. And although green and purple may not have been my first choice for a color scheme, I definitely think it is a very nice and high-contrast color scheme that I'm able to observe everything on quite well.

Some responses included suggestions for improvement (*n* = 3, 30%), such as broadening the response options to reflect different interviewee personalities and creating a mobile application.

Recommend the Product

All 10 participants stated that they would recommend VIT-TAY to their peers. Half of the participants (*n* = 5, 50%) indicated they would recommend the product because it is informative. Several of these responses focused on the disability-related information; for example, "because sometimes, in school, they do teach us about doing resumes and interviews and all that. But I don't remember one time we've ever gone over, what happens if you do have a disability?" Another participant stated:

> [I]n our schooling and with the various service providers we already associate with throughout our childhood, we should be learning a lot of these things and our rights through the ADA [Americans with Disabilities Act] and everything like that. But, we just are not taught that. And this is very crucial information that we should know and just so we don't get taken advantage of.

Additional reasons for recommending the product relate to its functionality (*n* = 5, 50%), including the accessibility features and versatility (i.e., no time or scheduling restrictions), and the ability to practice interviewing (*n* = 3, 30%).

Continued Use

Nine participants (90%) reported that they would use or consider using VIT-TAY after the study. Most were interested in using it to prepare for future interviews and employment (*n* = 8, 80%). One participant commented:

> I think I would use it right before an interview just to make sure that I was in the mindset of the questions. Because it is nice to have someone to ask me those questions. It's one

thing to know they're going to be happening. And it's another thing, even if it's a computer, to just be asked in that moment.

Some participants said they would use VIT-TAY because the content is informative or helpful (*n* = 4, 40%). The one participant who did not want to use it did not like the overall look and design of the user interface.

Barriers

Most participants did not report any barriers that would prevent them from using VIT-TAY (*n* = 6, 60%). Three participants (30%) identified minor issues with the product that could result in barriers, including "having to log in all the time" and difficulty finding the button to launch the interview simulation. One participant cited an external barrier that could interfere with how quickly the content loads: "the only barrier I can think of would be having slow Internet, which isn't really something that you guys can control for."

Discussion

The purpose of this study was to investigate the usability of a virtual job interview simulation (i.e., VIT-TAY) adapted for transition-age youth with visual impairments and to improve the product's accessibility and user experience for the same population. Ten transition-age youth with visual impairments interacted with VIT-TAY and completed specified tasks during remote moderated usability sessions. Our findings show that study participants completed most of the tasks without assistance, as indicated by the 83% overall success rate, with most failures attributed to the usability of the interface (e.g., difficulty logging in) or accessibility issues unique to certain combinations of technologies. Furthermore, task completion times suggest variability in efficiency across tasks and participants. Participants were satisfied with the product, and while several issues were identified, most were suggestions or minor issues.

Average task completion times varied from under a minute to almost 21 minutes, as expected, given the differences in the nature and complexity of the tasks. However, completion times also varied widely within several tasks (e.g., find learning goals, find disclosure example). Some of this variability can be attributed to differences in participants' technology skills, how they approached the tasks, and their verbosity when providing feedback. For example, some participants took extra time to explore the product or thoroughly review its content, and others provided extensive feedback about the product, which may or may not have related to the task at hand. Other reasons for the wide variation in task completion times include technical issues with the product (Sherwood et al., 2023), AT, or web browser; and distractions during the usability session (e.g., multitasking or other programs open on the participant's computer). Another factor that could have affected task completion times, specifically for several screen reader users, was having to slow down the speech rate of their screen reader so the researchers could understand it (Petrie & Wakefield, 2020). Screen reader users tend to listen to their screen readers at a higher speed and can comprehend the information presented at a higher rate than non-screen reader users (Asakawa et al., 2003; Guerreiro & Gonçalves, 2015); therefore, participants had to listen to and comprehend the information at a slower rate during the session.

Generally, participants rated VIT-TAY's usability highly, which is consistent with previous findings among transition-age youth with non-visual disabilities (Sherwood et al., 2023; Smith et al., 2022). Participants reported overall satisfaction and positive experiences with the product and said they would recommend it to their peers. Several participants mentioned the value of the disability-related content, as it addressed topics not traditionally taught in school or through other transition or employment services. Despite these positive findings, additional

research is needed to evaluate the usability and effectiveness of VIT-TAY with a larger sample of transition-age youth with visual impairments.

Most issues identified during the study were either suggestions or minor issues. Some of the issues were usability issues, but others were accessibility issues, which is a common finding among mainstream technology (C. M. Baker et al., 2019). SIMmersion's quality-assurance analyst recreated each issue to determine its source and scope, as some issues only occurred with certain combinations of technology. Most of the major issues and blocker issues were unique to a specific browser and screen reader combination. For example, in recreating the issue where one user's screen reader read text from the previous page (blocker issue), the analyst identified that the error only occurred when using the Job Access With Speech (JAWS) Links list in a Mozilla Firefox browser and could not be recreated with other combinations of screen readers, settings, and browsers.

Issues located in VIT-TAY-specific files were assigned to the content developer, and issues in the core technology were assigned to the software developer. SIMmersion's development team collaborated with the researchers using an iterative development process to ensure the solutions identified met both accessibility and usability needs and did not create issues for other user groups. For example, in response to two participants' request to review the virtual help coach's feedback immediately following their most recent choice without first reviewing the interviewer's question and other items that appear on the screen before the feedback (suggestion), the development team and the researchers had to consider how a change might affect the visual user interface, the accessibility, and the usability. After several iterations, the development team implemented a change using heading functionality that allows screen reader users to skip directly to the on-screen feedback without impacting visuals or other functionality.

Our experiences with implementing a remote moderated usability study with transition-age youth with visual impairments can inform others interested in conducting remote usability studies with this population. None of our study participants utilized the provided Word document listing the usability tasks during the session. All participants used one monitor or screen during the study and did not have the option to open the document on a separate screen to refer to. We may have had to prompt or remind some participants about the tasks more often because they were unable to reference the Word document. For future usability studies, if sharing the tasks ahead of time, it would be beneficial to provide instructions to participants to either print, emboss, or open the task document on another device to easily access it during the session.

A few things that worked well for our remote moderated sessions were allocating double time for each session and not scheduling sessions back-to-back. We intentionally allowed 2 hours for each session based on our conversation with AFB Consulting who advised that remote usability sessions take longer with people with visual impairments because of the AT involved. We also used the Zoom videoconferencing platform because it tends to be more accessible and easy to use for this population (Doush et al., 2023; Leporini et al., 2021). Although we offered a pre-session to orient participants to Zoom, none of them utilized it, perhaps since they were already familiar with the platform because of the increased usage of videoconferencing platforms during the coronavirus pandemic (Doush et al., 2023; Leporini et al., 2021; Petrie & Wakefield, 2020). With that said, some participants struggled with sharing their screen with computer audio and knowing the necessary keystrokes to navigate Zoom. We recommend having a list of screen reader keyboard commands available to suggest as needed (Petrie & Wakefield, 2020).

As mentioned previously, we asked some of the screen reader users to slow down the speech rate of their screen reader for the researchers' comprehension and for transcription of the

audio (Petrie & Wakefield, 2020). We utilized two different auto-generated transcription methods, but neither was sufficient for producing accurate transcripts of the sessions. The transcripts required in-depth human review and extensive editing to tease out all the different voices potentially talking at once (e.g., screen reader, participant, VIT-TAY, researcher), which may be important to consider when planning usability studies with screen reader users. It is also helpful for researchers to be familiar with screen reader terminology when reviewing the transcripts to understand what the screen reader is communicating.

Adapting an intervention for a new population requires several considerations. We relied on stakeholder input and feedback to make sure the additions and changes to the content were valid for people with visual impairments (Smith et al., 2020; Stirman et al., 2013). We also ensured that all the information, new and existing, was current, relevant, and clear for other user groups. When adapting technology-based interventions for new user groups, usability testing is essential. Technical accessibility (i.e., WCAG standards) does not guarantee a product will be usable for everyone (Tomlinson, 2016). As our findings demonstrate, usability testing can identify both areas for improvement in the user experience (i.e., usability) and accessibility issues even for products like VIT-TAY that already meet WCAG standards. Additionally, usability testing offers an opportunity to review the combination of multiple technologies and clarify language for better comprehension within specific populations. For example, while the VIT-TAY content is written at a fourth-grade reading level, several participants had trouble starting the program after logging into the Training Center, which had not been evaluated for reading level, because they did not know the meaning of the word “Launch.” Then, after launching VIT-TAY, participants were asked to “select a voiceover voice” (i.e., male or female) to read response options aloud within the interview interface. VoiceOver is also a type of screen

reader technology, so the multiple meanings of the term caused confusion. Several participants thought the selection referred to the screen reader or did not understand which voice they were selecting (i.e., the interviewer's voice or something else).

Furthermore, the accessibility needs of the original user group may not align with the needs of new user groups. For instance, as previously mentioned, closed captions were originally set to always display during video playback. However, this setting caused the screen readers to read the closed captions over the video audio, preventing screen reader users from understanding the video content. To address this issue, the closed caption default setting was switched to "off." This issue illustrates the importance of not only having accessibility features available for all user groups but also allowing the various settings to be customizable to meet the specific needs of each user.

Several limitations of this study need to be considered when interpreting these findings. First, participants may have been more technologically inclined than typical users, as indicated by their high self-reported technology skill level. The study participants were also at the upper end of the age range for the targeted age group. Younger participants may have lower technology skills and potentially could have identified additional usability or accessibility issues not identified by those with intermediate or advanced technology skills. The researchers verbally administered the SUS and open-ended questions, potentially leading to social desirability bias in the participants' responses. Finally, the think-aloud protocol and slowing down the screen readers' speech rate could have interfered with the measurement of task time.

In conclusion, it is important to consider the usability and accessibility needs of each potential user group of any product. This study found virtual simulations to be a viable learning option for transition-age youth with visual impairments. It also provided insights for future

researchers interested in conducting remote moderated usability studies with people with visual impairments.

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Declaration of Interest Statement

Laura Humm is employed by and owns shares in SIMmersion, LLC, and SIMmersion may benefit from sales of VIT-TAY. The University of Michigan receives royalties from the sales of VIT-TAY that are shared with Dr. Matthew Smith and the University of Michigan School of Social Work. Dr. Smith consulted on the study design and supported the dissemination of the study results, but did not collect or analyze any research data.

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Table 1

Participant Demographics

Variable	*n*	%
Gender		
Female	5	50
Male	5	50
Race		
Asian	2	20
White	6	60
Multiracial	1	10
Some other race	1	10
Hispanic ethnicity		
No	9	90
Yes	1	10
Vision level		
Totally blind	5	50
Legally blind with minimal functional vision	1	10
Legally blind with some functional vision	2	20
Low vision	2	20
Education		
Less than high school diploma	3	30
Some college but no degree	5	50
Vocational or technical degree or certificate	1	10
Bachelor's degree	1	10

Table 2

Devices and Software Used During Usability Study

Participant	Hardware/Peripherals	Operating system	Assistive technology	Browser
1	Computer Keyboard	Windows	JAWS	Chrome
2	Computer Keyboard	Windows	NVDA	Chrome
3	Computer Keyboard	Windows	JAWS Braille display	Firefox[a]
4	Computer Keyboard	MacOS	VoiceOver	Chrome
5	Computer Ultra-wide monitor Keyboard Mouse	MacOS	Built-in magnification	Chrome
6	Computer Keyboard	Windows	NVDA	Chrome
7	Computer Keyboard Mouse	Windows	Fusion	Chrome
8	Computer Keyboard	Windows	JAWS Braille display	Chrome
9	iPad Touchscreen On-screen keyboard	iOS	Built-in magnification	Safari
10	Computer Keyboard Mouse	Windows	Built-in magnification	Chrome

Note. JAWS = Job Access With Speech; NVDA = NonVisual Desktop Access.

[a] Chrome browser had technical issues with the login screen.

Table 3

Usability Study Scenarios, Tasks, Success Rates, and Completion Times

Scenario	Task	Success rate	Completion time (in minutes)			
			Mean	*SD*	Median	Range
Pretend you have an upcoming interview for a part-time job and you would like to brush up on your interviewing skills. Your friend told you about an online program called *Job Interview Training for Transition-Age Youth with Rita Muniz and Travis Bishop*. Log in, start the program, and tell us what you find on the home screen.	Log in	80%	1.15	0.57	1.03	0.52–2.55
	Launch product	70%	1.01	0.56	1.10	0.30–1.83
	Explore home screen[a]	100%	–	–	–	–
You are really interested in trying a virtual interview, and you want to learn more. Click on The Interview button, find the learning goals section, and play a video.	Find learning goals	90%	2.20	4.61	0.62	0.08–15.22
	Play learning goals video	90%	0.88	1.50	0.36	0.12–5.03
Now that you know what the interviewers are looking for, you are ready to start the interview. Click on the Interview Now button, begin the conversation, and greet the interviewer.	Start interview	80%	2.24	1.29	2.17	0.25–4.12
	Greet interviewer	80%	1.78	2.09	0.87	0.23–6.97
Continue the interview.	Complete an interview	90%	20.96	6.82	22.14	12.23–32.15
You've completed the interview. Play the video to find out how you did.	Play results video	90%	0.44	0.81	0.18	0.05–2.70
You did not mention your disability during the practice interview, but you want to be ready in case it comes up during your upcoming interview for the part-time job. Find the section about how to talk about a disability, and give us an example of how you	Find disclosure example (in e-learning materials)	60%	6.94	4.82	5.16	1.85–15.52

could tell an interviewer that you are blind or have low vision.	

Note. SD = standard deviation. [a] Untimed task.

Table 4

Overview of Primary Issues Identified During Usability Study

Description	Type	Count
High priority		
Could not access Training Center log-in screen due to known browser issue	Blocker issue	2
Suggested simplifying categories or adjusting layout of Table of Contents	Strong suggestion	4
Screen reader read virtual help coach feedback incorrectly or inconsistently	Minor issue	2
Difficulty recognizing videos when thumbnails were white on white background	Minor issue	3
Screen reader read captions during results videos	Minor issue	4
Screen reader read text behind pop-up boxes	Major issue	1
Could not access videos with screen reader	Blocker issue	1
Confusion about voiceover voice selection on interview Personalization screen	Minor issue	5
Screen reader read graphics that did not appear on screen	Minor issue	4
Low priority		
Screen reader indicated that three tabs were all “selected” simultaneously	Minor issue	1
Search bar not functioning correctly with screen reader	Minor issue	3
Screen reader read “blank” for Home graphic and did not read breadcrumbs	Minor issue	1
Confusion about meaning of “launch” when finding Launch button	Minor issue	3
Wanted to jump directly to the job coach feedback for the most recent response	Suggestion	2
Could not exit interview Personalization screen without proceeding	Minor issue	1
Certain interview questions did not flow smoothly or logically	Minor issue	2
Screen reader read text from previous page when using Links list to navigate	Blocker issue	1
Screen reader read text that did not appear on Interview Options screen	Major issue	1
Screen reader found unlabeled button that did not appear visually	Minor issue	1

Note. Count = number of participants experiencing the issue.

Supplemental Table 1

Interview Basics Adaptations

Type	Adaptation/Modification	Identified by
Adding	Added information about the accessibility of and reasonable accommodations for job listings and applications	Stakeholders
	Addressed alternative methods for completing and proofreading applications (i.e., low vision devices, assistive technology)	Stakeholders
	Discussed implications of adding details that reveal a disability (e.g., organizations or schools for the blind) on resume	Stakeholders, Researchers
	Emphasized the importance of resume layout and formatting and suggested review by a sighted person	Stakeholders
	Discussed using a screen reader when proofreading resumes and potential pitfalls	Stakeholders
	Discussed reviewing photos non-visually and how information on the Internet may reveal a person's disability	Stakeholders, Researchers
	Addressed portraying blindness as a positive and describing and demonstrating assistive technology (AT) and other alternative techniques to complete job tasks	Stakeholders
	Discussed practicing posture, handshake, eye contact, and nonverbal communication	Stakeholders
	Added information about getting oriented to the area, planning public transit, and having a backup transportation plan when preparing for an interview and starting a new job	Stakeholders
	Discussed preparing interview outfit in advance and getting feedback from friends or family on clothing and appearance	Stakeholders
	Added looking in the direction of the speaker if you can't make eye contact	Stakeholders
	Expanded the section about disability disclosure, including considering whether the disability is visible, implications of disclosure timing, and examples for modeling disclosure and accommodation discussions	Stakeholders, Researchers
	Expanded the information about thank you notes and reflecting on the interview	Researchers, Stakeholders
	Discussed resources for identifying and accessing accommodations	Stakeholders
	Added a section about videoconferencing for interviews	Researchers
Tailoring	Restructured the content flow to incorporate new sections and information	Researchers, SIMmersion

	Under Find a Job Opening, included information about employment agencies, vocational rehabilitation, and identifying unadvertised jobs	Stakeholders, Researchers
	Updated information about getting a free email address	Stakeholders
	Under Contact Information, discussed providing last 4 digits rather than the full Social Security number	Stakeholders
	Discussed what to do if something unflattering and permanent about yourself comes up in a search engine	Stakeholders
	Under Getting Ready, added talking to people who work for the company to learn about the company and prepare for the interview	Stakeholders
	Replaced “call to ask about wearing a suit” with “learn about the company dress code and dress a little nicer”	Stakeholders
	Added AT and other devices (e.g., magnifier) to the list of items to bring to the interview, including having documents to refer to in electronic or another accessible format	Stakeholders
	Addressed appropriate cell phone use during interviews	Researchers
	Made minor revisions to phrasing related to the Americans with Disabilities Act	Researchers
	Made minor edits throughout for clarity, replacing words like “that” or “this” with more specific words/phrases (e.g., job application)	Stakeholders

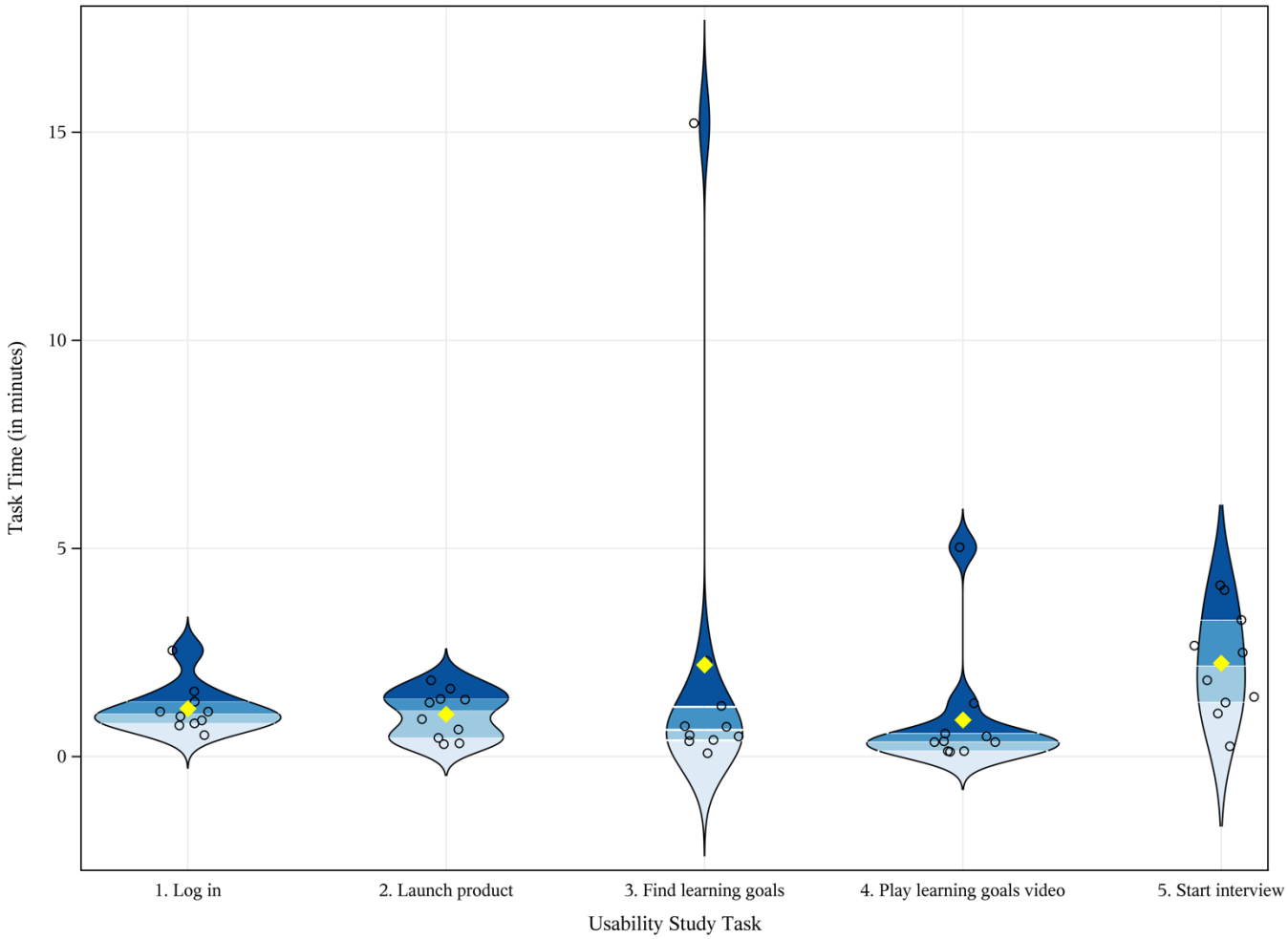
Supplemental Table 2

Frequencies of Participants' SUS Responses

Variable	System Usability Scale				
	1 – Strongly Disagree	2	3	4	5 – Strongly Agree
I think that I would like to use this product frequently.	0	0	3	3	4
I found the product unnecessarily complex.	3	3	2	2	0
I thought the product was easy to use.	0	0	1	7	2
I think that I would need the support of a technical person to be able to use this product.	9	1	0	0	0
I found the various functions in this product were well integrated.	0	0	2	4	4
I thought there was too much inconsistency in this product.	4	3	3	0	0
I would imagine that most people would learn to use this product very quickly.	0	1	1	4	4
I found the product very awkward to use.	6	1	3	0	0
I felt very confident using the product.	0	1	1	4	4
I needed to learn a lot of things before I could get going with this product.	5	3	1	1	0

Supplemental Figure 1a

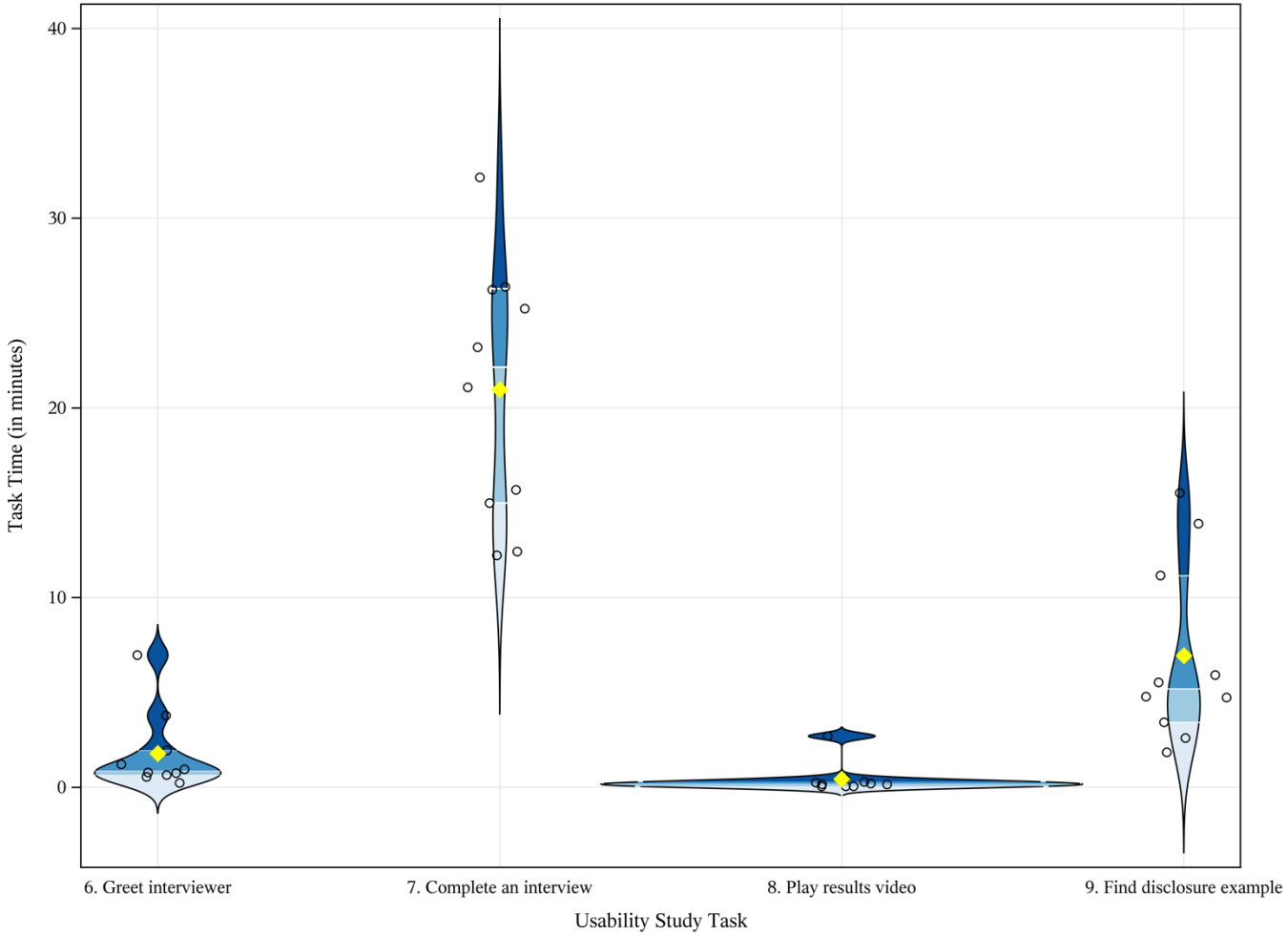
Usability Task Time Violin Plots



Note. Diamonds represent means, and circles represent data points.

Supplemental Figure 1b

Usability Task Time Violin Plots



Note. Diamonds represent means, and circles represent data points.