Usability Testing of Platforms for an Alternative Augmentative Communication (AAC) Mentorship Module

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Abstract

The goal of this resource development project was to evaluate content delivery interfaces for presenting an Alternative Augmentative Communication (AAC) Mentorship module in multimedia format (e.g., text, video and images) and test them with typical devices used by individuals who use AAC. A variety of content delivery interfaces (i.e., social media sites, open websites) were assessed to see if they met the established inclusion criteria. The interfaces that met the criteria were populated with the module content and were examined via usability criteria (e.g., navigation and layout). Different methods of alternative access including direct access, eye gaze and scanning were evaluated.

Rationale

This resource development project was part of a larger study based at the interdisciplinary I CAN Centre for Assistive Technology at the Glenrose Rehabilitation Hospital in Edmonton, Alberta. The I CAN Centre speech language pathologists (SLPs) recommend and assess Alternative Augmentative Communication (AAC) devices for clients in Northern Alberta to increase their daily functional communication. The study focuses on training high functioning individuals who use AAC on effective mentoring strategies. Mentoring from an experienced AAC user can provide positive experiences for youth who use AAC because they serve as models of success, providing encouragement and expert advice which is meaningful for the youth because the mentors were once in a similar position of struggle as them (O'Mally and Anotonelli, 2016). With a high degree of AAC device abandonment, a mentoring program with experienced AAC users could help newcomers learn how to use their devices efficiently (Ballin et al., 2009). Before experienced users begin to mentor it is important that they learn proper mentoring strategies. An AAC Mentorship module was created for the study using open source forum software. The forum includes the content from Penn State University (Light et al., 2007) and a way to interact with a trainer in role play scenarios (i.e., I CAN Centre SLPs) in simulated scenarios that the mentor could actually experience with mentees. The module was evaluated by AAC users and it was reported that it was not user friendly due to the heavy use of text and was difficult to navigate when accessing the forum from an AAC device (Tate et al., 2016). The purpose of this resource development project was to decrease the use of text, examine other content delivery interfaces and test their usability when accessing them from common AAC devices.

Process

1. Inclusion criteria for the content delivery interfaces were determined by consultation with the I CAN Centre clinicians. Inclusion criteria were that each content delivery interface could: (1) display a variety of modalities including text, video and images; (2) support role play interactions between the trainer and mentor and (3) support easy editing and customizing.
2. The content delivery interfaces that met the inclusion criteria included Facebook and Tumblr. Wix Website Builder and Google Sites did not meet the role play criteria because it was not possible to interact on the interface. However, they were still included because they were able to display the text, videos and images very well. The I Can Centre team decided that the role play interactions could be completed on another interface (e.g., email).
3. Written content from the Penn State University materials (The AAC Mentor Project, n.d.) was converted to visually appealing slides with images and minimal text.
5. The selected interfaces were populated with the slides, and also links to videos that show individuals who use AAC practicing the mentor strategies (Tatenhove, 2014).
6. The content delivery interfaces were tested for usability on two commonly used AAC devices: (1) Tobii Dynavox I-15 and (2) Prentke Romich Company Accent 1400 via the touch screen
    - Platforms were assessed based on Usability Criteria that was adapted from Horton et al., 2017.
        - Navigation: no problem navigating between pages or identifying suitable links for information/ functions
        - Layout: do not encounter difficulties due to web elements, display problems, visibility issues, inconsistencies, problematic structures or form design
7. Navigating the interfaces using alternate access methods was also evaluated (e.g., eye gaze and scanning). Eye Gaze was simulated by moving the cursor and clicking on a trackpad. Scanning was simulated by pressing the tab key (to move between screen elements) and the enter key (for selection). Both were simulated using a MacBook Pro.
8. Afterwards, each content delivery interface was edited to increase usability, where applicable.

Results

The selected interfaces for the AAC Mentor module with the content are shown in Figure 1 a, b, c and d.

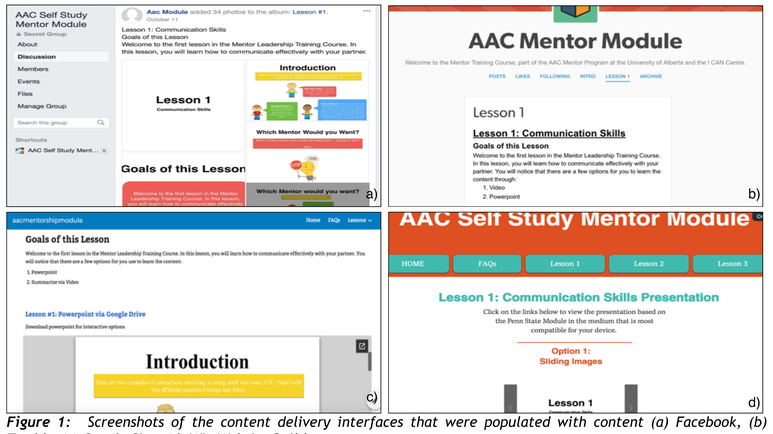

Figure 1: *Screenshots of the content delivery interfaces that were populated with content (a) Facebook, (b) Tumblr, (c) Google Site, (d) Wix Website Builder*

The results of the evaluation of navigation on the AAC devices via touch screen for each interface are shown in Table 1. The navigation between pages, within pages and between lesson slides was evaluated regarding whether scrolling or clicking was required as well as the size of the screen elements.

Table 1*: Navigation via touch access among the content delivery interfaces.*

	Facebook	Tumblr	Google Sites	Wix Website Builder
Between Pages	Click Difficult to move from page to page because screen elements are too small to touch **Accent**: When numbered keyboard shortcuts were visible, it made interface appear very cluttered (Fig. 2)	Click Difficult to move from page to page because screen elements are too small to touch	Click Font can be enlarged so screen elements are large enough to touch	Click Font can be enlarged so screen elements are large enough to touch
Within Page	Scroll	Scroll	Scroll	Scroll
Between Lesson slides	Click	Scroll	Scroll	Click

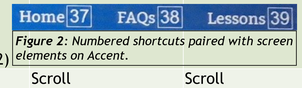

Figure 2*: Numbered shortcuts paired with screen elements on Accent.*

The results of the evaluation of the layout for each interface are shown in Table 2.

Table 2*: Summarized pros and cons of layout among the content delivery interfaces.*

	Facebook	Tumblr	Google Site	Wix Website Builder
Layout	**Pro:** Slides and videos open without opening another program **Con:** Limited characters allowed in posts	**Con:** Can only view videos by clicking link which opens in another program	**Pro:** Slides and videos open without opening another program **Con**: Enlarging slides and videos opens a new program	**Pro:** Slides and videos open without opening another program **Con:** Enlarging slides and videos opens a new program

The results of navigating using the alternate access methods for each interface are shown in Table 3. Scrolling was difficult with both access methods (eye gaze: scroll bar was too small, scanning: could not access onscreen scroll bar with tab key)

Table 3: Summarized pros and cons of navigation via eye gaze and scanning access methods among the content delivery interfaces.

Access Method	Facebook	Tumblr	Google Site	Wix Website Builder
Eye Gaze	**Con:** Small font makes it difficult to pick correct screen element	**Con**: Small font makes it difficult to pick correct screen element	**Pro**: Able to make font larger to pick correct screen element	**Pro**: Able to make font larger to pick correct screen element
Scanning	**Con**: Many screen elements on page requires many tab presses **Con:** Cannot access all screen elements with tab key	**Con:** Cannot access all screen elements with tab key	**Con:** Cannot access all screen elements with tab key	**Con:** Cannot access all screen elements with tab key

Discussion & Conclusion

Discussion

- Each content delivery interface presented information differently depending on the AAC device.
- If an individual wants to download the lesson slides, the program that they were uploaded in needs to be available on the device (i.e. Powerpoint or pdf readers). Downloading was not an option on Tumblr.
- There was no difference when it came to navigating between and within pages. However, Facebook and Wix Website Builder required clicks to move between slides. Tumblr and Google Sites required scrolling to move between slides. Depending on a user's motor dexterity and preferences a certain interface may be a better match.
- All content delivery interfaces were able to present the AAC mentorship module content via text, images and videos. However, Tumblr presented videos via a link to another program (i.e. Youtube).
- Google Sites and Wix Website Builder enable enlarged fonts making screen elements larger, which could benefit individuals who use touch or eye gaze.
- Not all content could be accessed on an interface using scanning because all screen elements could not be accessed with the tab key. In addition, Facebook's large amount of screen elements resulted in many tab presses to get to the desired screen element.

Limitations:

- Eye gaze and scanning access methods were simulated. Individuals using eye gaze or scanning on their own AAC devices may encounter more limitations.
- The designer of these interfaces was a novice, and likely some cons could be solved by an expert designer. However, an objective of this project was to find interfaces that could be edited by a layperson.

Recommendations

- Test more content delivery interfaces on more AAC devices. Some language sets have shortcuts, which could make navigating easier.
- Survey individuals who use AAC for their opinions on the developed interfaces.

References/Acknowledgements

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