Institute for the Study of Knowledge Management in Education (ISKME)

ED-OSE-12-D-0013-0003

Deploying Initial Preference Setting in Two Domains:

Evaluating and Exploring Needs for Further Preference Setting

**Deliverable 1.2 - ICT Report on Deployment Technology   
and Plans for Working With Participants**

February 10, 2016

**About This Report**

This report is part of contract ED-OSE-12-D-0013-0003, which focuses on the deployment of initial and extensible preference setting tools in real-world OER and Older Citizens application settings. This report describes the technology to be used in the deployment/evaluation studies, and plans for working with the stakeholder integrator and site team at each of the following four sites: SeniorNet, OASIS (Crown Senior Center), University of Colorado - Boulder, and SIATech High School.

1. **Site Profiles: ICT & AT**

Information on the technology infrastructure was gathered through phone-based discussions and a questionnaire administered to the leaders at each deployment site. This effort sought to capture specific information on the types of devices and software used by each site’s end users, and on their existing accessibility program to ensure that the tool development and integration work will be successfully aligned to the needs and infrastructure of the selected sites.

Table 1, below, outlines devices and software used at each site, and Table 2 lists details about each site’s existing accessibility program or approach.

**Table 1. High Level ICT & AT Infrastructure at Each Site**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Org, Site** | **Device Types** | **Browser** | **OS** | **Assistive Technology** |
| SeniorNet, Huntington, NY Learning Center | Laptops, Desktops, users’ own mobile devices | Chrome, Internet Explorer | Windows 8.1+, various mobile OSs | No additional ATs installed beyond the default settings that are part of the Operating Systems used |
| OASIS-Crown Senior Center | Desktops, users’ own mobile devices | Chrome, Internet Explorer | Windows 10, various mobile OSs | No additional ATs installed beyond the default settings that are part of the Operating Systems used |
| UC Boulder, Accessibility Lab | Tablet, Desktops, Laptops | Chrome, Firefox, Internet Explorer | Windows 7 and 8.1, Mac OSX 10.11 | MathType 6.0, Zoomtext 10, WYNN 6.0, Scientific Notebook 5.5, Kurzweil (latest version), Jaws 17, NVDA 2015.3, and DBT 11 |
| SIATech, LA Campus Learning Lab | Tablets, Desktops, and Laptops | Chrome, Internet Explorer | Windows 8.1 | No standardized installation packages; specialized to individual student need. Currently includes screen readers and monitors with adjusted resolution settings |

**Table 2. Existing Accessibility Programs/Approach for Each Site**

|  |  |
| --- | --- |
| **Org/Site** | **Accessibility Program/Approach** |
| SeniorNet, Huntington, NY Learning Center | SeniorNet focuses on both a “seniors teaching seniors” approach, as well as an intergenerational approach, in which high school and college students teach current technologies to older adults. SeniorNet’s approach to digital accessibility has not been explicit, and has been incorporated into general instruction pertaining to how to use a given device. There is no formal process for provisioning AT’s on the Learning Center’s technology, or for incorporating accessibility into instruction. |
| OASIS, Crown Senior Center | OASIS’s approach to digital accessibility focuses on adjusting device and web settings for comfort, similar to the way in which one would set privacy settings for personal comfort. Current digital accessibility programming is designed around use of mobile devices, using built in settings on smartphones and tablets. OASIS is considering expanding programming to desktops and laptops, but does not currently have the content or the expertise to support this. Crown Senior Center is independent from OASIS, and does not have a formal accessibility program in place for its residents or surrounding community members. |
| UC Boulder, Accessibility Testing Lab | The University of Colorado, Boulder operates an Accessibility Testing Lab where student workers are employed to test assistive technologies and help to create documentation describing accessibility features available on a wide range of campus technologies. This ranges from ATs such as JAWS screenreader and MAGic screen enlarger to preference setting features available on library database sites such as ProQuest and EBSCO. The University also supports authoring of accessible electronic resources such as web content and PDFs. |
| SIATech, LA Campus Learning Lab | SIATech Learning Lab machines include Windows desktops, tablets, and laptops, where accessibility accommodations are installed to accommodate specific needs of current students. Technology focused accessibility accommodations are most often made by individual teachers who are liaising with onsite IT staff on behalf of specific students. Formalized accessibility programming is largely focused on pedagogical accommodations. |

**2. Technology To Be Used for Deployment and Evaluation**

The First Discovery Tool development work for PGA Task Order 0003 has focused on several priorities identified in Task Order 0002, as well as new priorities that emerged through discussions with site leads at each of the deployment sites. Below is a brief summary of the First Discovery Tool software that will be deployed at the four sites, as well as the devices that the tool will be tested on at each site.

First Discovery Tool Software

The FD Tool software developed in the current task order builds on the web-based prototype built in Task Order 0002, which included the following preferences:

● Language

● Read screen aloud (text-to-speech)

● Speech rate for text-to-speech

● Text/background color

● Text/button size

● On-screen keyboard

● Captions for videos

● Show sounds

● Sticky Keys

The current iteration of the First Discovery Tool Software is comprised of the web-based application inside of a device based application wrapper. This facilitates secure communication with an instance of the GPII server, and enables devices to become “First Discovery Terminals” that are able to guide users through the process of selecting preferences, saving selections to the GPII, and saving a passcode to a USB device which can be used to retrieve preferences at a later date.

It should be noted that the main GPII server will not be used for this round of testing. Instead, an independent instance of the GPII server will be installed on each machine used for testing, which will be maintained by the PGA technical team. This will remove the need to involve external GPII development and administrative staff who manage the main GPII server, and ensure that participant data is only accessible to and managed by the research and technical teams working on this task order.

The following is a list of developments that were identified during the current task order, and which will be included in the deployment of the FD Tool at each of the four partner sites:

*Additional Preferences*

Research conducted in Task Order 0001 revealed the importance of preferences for seniors that provide support for visual impairments, and specifically preferences that reduce clutter and the appearance of overlapping text. Line spacing and character spacing were identified as important for seniors in particular, as with age, receptors in the eye are not uniform in their placement, which can lead to text overlapping. During conversations with site leaders in the two senior settings, it became evident that their end users would benefit from the addition of these two preferences. There is also some empirical evidence that line and character spacing can help with dyslexia and attention impairments, across all potential end users.[[1]](#footnote-1)

*Preference Preview*

The First Discovery Tool being deployed will now include a “preview pane,” which allows users to experience preferences as they are applied throughout First Discovery, to a piece of content which is typical to the environment of use. This provides additional context for understanding how preferences could be manifest in content beyond the use of the First Discovery Tool. The preview pane appears automatically near the beginning of First Discovery, and remains open until preference selections have been finalized, cumulatively rendering all preference settings as the user proceeds.

*Saving Preferences*

The ability to offer users the choice of saving preferences was identified as a high priority item in Task Order 0002. During the current Task Order, a solution was developed that allows preferences set during First Discovery to be saved to the cloud, and retrieved with a token that is automatically saved to a USB key. This will allow future tools to access and apply these preferences using the token stored on the USB key.

ICT Provisioning and On-Site Configuration

The current iteration of the First Discovery Tool software should be considered a development version, and is not ready to be independently deployed in production settings by site integrators. This software will need to undergo testing with the official GPII server, as well as other existing preference framework tools before it will be ready for truly independent beta testing. Additionally, we would need to develop software installation packages that can be distributed and used by lay persons or IT administrators.

The current version of the software requires installation by a developer and database administrator at a minimum. Given this, we will not install the software on machines owned and operated by the site. Usability testing machines will be provisioned by IBM, and will have the First Discovery Tool and GPII server software pre-installed. Testing will be conducted using machines running Windows 7, and the FD Tool will be accessed using the Chrome browser. Site managers will have the option to request testing on laptops or desktops.

No assistive technologies are currently required to use the First Discovery Tool. The only requirement is use of the Chrome browser and successful connection to the internet. An IBM representative will travel to each testing site to provide tech support, and ensure smooth functioning of the FD software with the local internet connection.

**3. Plans for Working with the Sites**

On-site deployment and evaluation of the software will be conducted as part of controlled end user usability testing sessions and site integrator interviews at each site. This section outlines the on-site deployment team and their roles, as well as an overview of usability recruitment and testing procedures.

On-Site Deployment Team

The deployment team and roles are listed in the tables below. Table 3, below, lists the external stakeholder team at each site, which includes a project manager, an integrator, and a recruitment lead (and these roles often overlap), as well as the end-users who will participate in the usability tests. The PGA team that will participate in on-site deployment activities are listed below in Table 4, and will include a PGA technical support person, a usability researcher, and a note taker for the usability testing sessions.

**Table 3. Site Stakeholder Team: Roles and Tasks To Support On-Site Deployment**

|  |  |
| --- | --- |
| **Role** | **Tasks/Responsibilities** |
| **Project Manager**  *SeniorNet:* Leslie Smith  *OASIS:* Amy VanDeVelde  *SIATech:* Nicole Taylor  *UC Boulder:* Pramila Patel | * Coordinates and ensures participation of all onsite stakeholders * Provides feedback on the tool during its development (prior to deployment/testing) * Provides high level information on each site’s ICT and AT infrastructure |
| **Integrator**  *SeniorNet:* Pat McAsey  *OASIS:* Florence Schachter  *SIATech:* Nicole Taylor  *UC Boulder:* Pramila Patel | * Provides detailed information on each site’s ICT and AT infrastructure * Provides a private testing environment and stable Wi-Fi connection for the usability sessions * After testing is complete, participates in a short interview to offer feedback on the integration of the tool at the site, and the potential ways the tool may support accessibility work going forward |
| **Recruitment Lead**  *SeniorNet:* Pat McAsey  *OASIS:* Florence Schachter  *SIATech:* Nicole Taylor  *UC Boulder:* Pramila Patel | * Administers (verbally or electronically) a participant screening form to inform the recruitment of a diversity of participants * Recruits 6-8 participants for testing sessions at each site, one of whom is a helper or assistant who will participate in the testing session on behalf of, or alongside, an end-user * Schedules testing sessions |
| **End-Users**  6-8 at each site (not yet recruited) | * After giving verbal consent, participates in a screening interview with the recruitment lead at the given site to determine eligibility for participation in the usability research * After giving signed written consent, participates in individual usability testing sessions lasting 45 minutes |

**Table 4. PGA Team: Roles and Tasks To Support On-Site Deployment**

|  |  |
| --- | --- |
| **Role** | **Tasks/Responsibilities** |
| **Technical Support**  TBD from IBM | * Sets up the usability testing machines prior to testing * Sets up the testing room on the day of testing * Remains on site for tech support during testing sessions |
| **Usability Researcher**  Nancy Frishberg, Center for Civic Design | * Works with the on-site technical lead to set up the equipment for the research, including a camera and speakers * Explains the usability testing process to participants at the start of each usability testing session, and gathers consent and release forms from all participants * Conducts the tests using pre-designed protocols * Debriefs with on-site project managers and integrators at the end of each testing day |
| **Note Taker**  Michelle Brennan, ISKME (2 sites)  Whitney Quesenbery, Center for Civic Design (2 sites) | * Participates in all testing sessions at a given site * Takes detailed notes on the testing activities as part of data collection |

Overview of Deployment and Testing

*Usability Testing Session Design (High Level Overview)*

The usability testing sessions will occur over the course of two days. Testing technology will be set up on the first morning, with the remaining part of the day being spent testing the first set of participants in the usability sessions. On the second day we will complete the tests with the remaining participants.

The test sessions will be conducted with each participant individually in a private testing room at each site, and will take approximately 45 minutes. At the start of each testing session, each participant will be debriefed regarding the purpose of the testing, and will be given the opportunity to consent in writing to participate in the usability study, and to release the screen and audio recording for the purpose of the research. During the usability testing session, each participant will experiment with the First Discovery Tool, in some cases with the help of an assistant. Two cameras will be used to capture the voices of the tester and participant, as well as movements on the screen, and the hands of the participants as they are interacting with the device. Simple, semi-structured questions will be asked by the usability researcher that focus on the user’s experiences with the tool.

*Recruitment of Participants*

Up to 32 end users will participate in the usability testing across the four sites. Of those, approximately six will be university students (ages 18-24), six will be adult high school students (ages 18-24), and 12 will older citizens (ages 50 and up). Up to eight participants (up to two at each site) will be adult helpers or assistants (family members, teachers, etc.) who will participate in the testing session on behalf of or alongside an end-user. Participants will represent a broad diversity of needs and preferences for accommodations, levels of technological skill, and if possible, socioeconomic backgrounds.

In order to recruit participants that meet the diversity parameters for the usability testing, potential participants at each site will be identified by a staff member at the site, using a participant screening form developed by the PGA team. The purpose of the form is to collect information on their current technology use and accessibility barriers experienced. Participants that meet inclusion criteria will be contacted by each site’s recruitment lead to set up a time for a usability testing session.

*Site Integrator Interviews*

Immediately following on-site testing, each site integrator will participate in a separate interview with a member of the PGA team. The interviews will focus on understanding administrative, budgetary, personnel, logistical and other benefits and challenges to the adoption of a future, full scale GPII enabled preferences framework tool at each site.

**4. Next Steps**

The Site Selection Report (Deliverable 1.1), which accompanies this report, describes the process for selecting the deployment partners, and lists the stakeholders that will participate in the integration and usability testing at SeniorNet, OASIS (Crown Senior Center), UC Boulder, and SIATech. Immediate next steps for the PGA project include completing the First Discovery Tool final development sprint, finalizing the usability testing plan, and working with recruitment leads to recruit participants for the usability testing.

1. See: Rello, L., Kanvinde, G.,  and Baeza-Yates, R. (2012). Layout guidelines for web text and a web service to improve accessibility for dyslexics. In *Proc. W4A 2012.* ACM Press: Lyon, France. See also: Hanson, V., Snow-Weaver, A., and Trewin, S. (2006). Software personalization to meet the needs of older adults, *Gerontechnology* 5(3), pp. 160-169. [↑](#footnote-ref-1)