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Emerging Technology

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Interactive Images in Library Instruction: A Case Study

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Interactive Images in Library Instruction: A Case Study

This paper discusses the design and implementation of the H5P image hotspots and describes additional use cases for library instruction in order to teach learners from across the country on how different spaces can be used to create private, accessible areas where patrons can conduct telehealth appointments. The Network of the National Library of Medicine created an online class using H5P image hotspots to allow learners to virtually explore a physical space. The class used Moodle, an open-source learning platform, and H5P image hotspots to demonstrate how libraries implemented telehealth programs.

Keywords: library instruction, interactive, instructional technology, library spaces, accessibility

Background

The Network of the National Library of Medicine (NNLM) is a funded program of the National Library of Medicine, part of the National Institutes of Health (NIH). The NNLM aims to advance the progress of medicine and improve the public health and the public's access to information to enable them to make informed decisions about their health¹. NNLM offers numerous free classes and training on health information and health literacy topics. While the primary audience of NNLM training is health science librarians, NNLM also addresses issues related to public and academic librarians, community organizations, health educators, and health and public health professionals.

One of the three primary initiatives of the NNLM for 2021-2026 is “bridging the digital divide.” NNLM aims “to promote technology and digital equity, digital literacy, and telehealth.”² The digital divide refers to the unequal distribution of information and communications technology and reinforces social inequities.³ The digital divide makes it harder for people to gain access, skill, and experience with technology. Promoting telehealth in libraries helps bridge that gap by providing training and access to

technology so people can connect virtually with healthcare providers. Telehealth is a broad term that encompasses the technologies and tactics used to communicate health information and provide health care over the phone or internet. ⁴ In this article, the term telehealth refers specifically to healthcare appointments that are conducted virtually.

NNLM uses Moodle, a comprehensive, open-source learning platform, to offer asynchronous training and connect with learners. As a condition of the cooperative agreements funding the NNLM, all materials created must follow the U.S. Department of Health & Human Services Information Policies, including accessibility compliance with Section 508 of the Rehabilitation Act of 1973. Any learning platforms or tools selected for training must meet these accessibility requirements as well.

H5P is an open-source plugin that can be used in Moodle and several other platforms to create interactive content. It provides a way to embed information into images so users can click on different areas of an image to learn more.

Use Case

In support of the Bridging the Digital Divide initiative, NNLM created a class called *Telehealth 101: What Libraries Need to Know*. It is an asynchronous class offered through NNLM's Moodle. The class was developed by subject matter experts and an instructional designer. The class provided an introduction to facilitating telehealth services in libraries or other community spaces. The intended audience was primarily public librarians and public library staff, with consideration for other community-based organizations. The course highlighted case studies from different libraries across the United States and discussed how they opted to create spaces for patrons to access telehealth.

The Problem

The objectives for the course ⁵ were:

- (1) Recognize the different approaches/models to providing telehealth access within libraries.
- (2) Discuss considerations such as privacy and policy for offering telehealth access within libraries.
- (3) Identify infrastructure-related resources available to the library for providing telehealth services.
- (4) Describe the role of the library in support of digital skills training for telehealth.

In order to meet the objectives, the class developers provided learners with a way to explore a variety of physical spaces in libraries that are being used for telehealth. The course content covered topics such as the importance of privacy, technology needs, and applicable library policies. The instructors wanted learners to visualize and virtually interact with the space and to provide a virtual or augmented reality experience. The importance of this is emphasized by Freitas and Nuemann who state that “virtual environments offer new opportunities for learners to learn through exploring environments.”⁶ Exploration gives learners a more personalized experience while supporting their unique areas of interest.

Additionally, instructors sought to virtually explore telehealth spaces using existing documentation and images. Public libraries often have limited physical space and even more limited budgets, so libraries interested in telehealth may need to be creative in utilizing what space is available at their facility. Telehealth programs in libraries are extremely new, and few examples of well-established programs exist. Constraints regarding time, travel, budget, and extended access to these telehealth spaces made creating a more in-depth virtual tour unfeasible.

The Solution

In order to meet the learning objective to recognize the different approaches/models to providing telehealth access within libraries, it was necessary to provide realistic examples of physical telehealth spaces in libraries. The course focused on two examples of libraries that integrated telehealth into their buildings. The first example in Delaware used a private kiosk from Talkbox⁷. The kiosk offered a small but accessible space with outlets, lighting, and sound dampening. The second example was from a small, rural library in Texas. They renovated an old storage room, adding lighting and technology, and provided patrons with a private external access point that enabled them to use the telehealth space without entering the library. The examples were intended to demonstrate different ways that telehealth spaces can be integrated into the library.

When deciding which tools to explore physical space, course developers reviewed existing Moodle tools and plugins for accessibility and functionality. They ultimately decided to use the H5P image hotspot, a tool that takes a static image and overlays information buttons. Users can click on the information buttons, and text appears. H5P hotspot was chosen because it was openly available, fit the intended purpose of learner exploration and accessibility standards, and could be implemented using existing resources.

The accessibility of the H5P hotspot was essential for creating an inclusive learning environment. As a company, H5P was transparent about how accessible each tool is and has a list of each tool and its level of accessibility available on its website. The H5P image hotspot in the Telehealth 101 class provided three means of accessibility:

- (1) Keyboard useability. The H5P hotspot can be navigated via a keyboard for learners with less mobility.
- (2) Ability to use screen reading software. H5P hotspots can be explored with the assistance of screen reading software. When building out the hotspot, it is essential to use appropriate labels for each pop-up with a different title and content. The H5P hotspot creates placeholders for these to make it easy to do for the developer.
- (3) The color contrast between the selected image and the hotspots improves accessibility. H5P image hotspots allow for a wide range of color options for the hotspots. Developers can choose high-contrast colors that are easy for learners to locate and view.

H5P hotspots were chosen because visualization of material positively affects learners, increasing their ability to identify and comprehend information.⁸ The content needed to be engaging and facilitate interactions between learners and course instructors. Anderson⁹ stated that valuable content engages students and teachers, and more interaction leads to more engagement, mindfulness, and motivation. H5P, an open-source software, provided the interaction and imitated the ability to explore a space in an engaging way without undue burden on instructors, the libraries, and their staff. H5P integrated how adult learners need to learn experientially and the hotspots are problem-focused.

With H5P, learners can see real world examples. For example, H5P allowed learners to interact with images of Delaware's specialized, private kiosks from Talkbox and Texas's renovated storage room. The H5P hotspot highlighted how Delaware's kiosk had a sound machine and was placed in a quiet location to maximize privacy. The hotspot for the Texas library showed how cameras and lighting were set up and

addressed mobility and space accessibility. After using the H5P hotspots to explore the Texas and Delaware telehealth spaces, learners were asked to brainstorm what a telehealth program might look like at their institution, further encouraging engagement and interaction. H5P was essential for allowing learners to imagine how such a space might look or function at their facility.

Tool Description

H5P, which stands for HTML5 Package, is openly licensed, and people can reuse, modify, and redistribute it. The website content is under a Creative Commons license and allows people or organizations to adapt and adjust the content as long as proper attribution is given. Content includes help documentation and author guides. The code behind H5P is also openly licensed under a MIT License, which allows for copying, modifying, publishing, and distributing H5P code. Some third-party code is under a GPL license, but that code will soon be made optional.¹⁰ H5P is openly licensed, making it an excellent option or add-in for open educational resources. People can use, modify, and share H5P without paying any fees or subscriptions.

Some of the benefits of using H5P are:

- **User-Friendly Interface:** H5P allows content creators to develop interactive content without needing advanced technical skills.
- **Easy Integration:** H5P allows easy integration with learning management systems (LMS) like Moodle, WordPress, Drupal, Canvas, and Blackboard. H5P content can also be embedded into LibGuides, making it a simple way to distribute content to learners. The process of integrating H5P to these LMS varies.

- **Open Source and Free:** H5P is open-source software, which means it is freely available for use, modification, and distribution, making it a cost-effective option for educational institutions and individuals.
- **Variety of Content Types:** H5P offers diverse interactive content types, allowing educators to create engaging and interactive learning experiences.
- **Accessibility:** H5P is committed to ensuring digital accessibility for everyone. They employ a formal accessibility quality assurance check and list their findings openly on their website.¹¹ H5P conducts screen reader testing using open-source, free screen readers such as NVDA and ChromeVox.

There are also some drawbacks to using H5P, including:

- **Limited Complexity:** While H5P offers a broad range of content types, it may not cater to highly complex activities.
- **Internet Connectivity Requirement:** As H5P content is web-based, learners need an internet connection to access and interact with the materials.
- **Learning Curve for Some Content Types:** H5P is easy to use, but some content types might have a steeper learning curve, especially for those new to digital content creation.

Image Hotspots are an accessible content type¹¹, meaning that there are no known accessibility issues for the end user, and it has been tested against WCAG 2.1 AA criteria.

Methods

Course instructors aimed to create content that encouraged exploration and curiosity for our learners. Creating a hotspot allowed them to explore key elements of a

telehealth space in the order of their choosing and to use their creativity to envision what telehealth could look like in their library. Course instructors also wanted learners to explore specific components for successful telehealth experiences in a given space.

Figure 1: Image of the Pottsboro Library telehealth space that was used for the telehealth hotspot

Course instructors used hotspots to highlight physical aspects necessary and conducive to a thorough, effective telehealth experience. They included features recommended by the California Telehealth Resource Center,¹² such as adequate and well-placed lighting, room organization, and technology. The hotspots also showed unique features, such as sound machines, privacy features, and additional medical equipment such as a blood pressure monitor and scale.

Once the outline was established, the instructional designer built the H5P hotspot in our Moodle H5P content bank. The instructional designer added the main image and set hotspots for specific components instructors wanted to emphasize.

Figure 2: Image of the settings for the hotspot in Moodle

The instructional designer then added pop-up text to provide more context to the learner about the selected component. For example, on the image of the bookshelf, the text “Ancillary materials such as a blood pressure cuff, scale, thermometer, and pulse oximeter can help clinicians gather more information about their patients” was added to point out medical equipment included in the physical space.

Figure 3: Image of the settings for the hotspot in Moodle.png

Once the hotspot was built, usability tests were completed. Initially, we tested the hotspots to ensure they could be navigated with mouse and keyboard. To do this, we used the tab key to navigate the hotspots and enter keys to open and close the hotspots. Next, we used NVDA to test the screen reading capabilities of the hotspot. We ensured

that the screen reader read the alt text of the background image on the hotspot and each of the titles and subtext within the hotspots, as shown in Figure 4 and 5.

Figure 4: Screenshot of image hotspot in Moodle with unselected hotspot visible

Figure 5: Screenshot of image hotspot in Moodle with “Door” hotspot selected

Results

Registration for the class was capped at 75 and reached capacity quickly, so a second instance was added. In total, 151 people registered for the class, 88 participated, and 53 completed all components. Based on 50 completed evaluations, 86% of learners agreed (54%) or strongly agreed (32%) that the class was engaging.

In the free response comments, five people commented that “seeing” how telehealth was implemented in other libraries was the most valuable aspect of the training. Another ten learners commented that having examples was the most helpful aspect. Learners often used the adjective “real-world” when describing the examples.

Sample comments from the class included:

“The real-world examples of libraries offering telehealth services. Especially, the parts that examined how they adapted and modified their facilities and procedures, as they learned what worked and what didn't work.”

“Seeing specific examples of telehealth helps me imagine this in my own library as well.”

“The most useful aspect was being able to see how other libraries are using telehealth services and being exposed to new resources for telehealth information and funding.”

“It was great to see (and hear) about the actual examples from across the country.”

These comments clearly illustrate that using real examples and photos in the hotspots made the class more useful and engaging.

Discussion

Using H5P image hotspots was a successful way to explore physical spaces in an online class. Instructors were satisfied that it achieved the instructional goals, and the interactive images were more effective than static photos. Students found the course engaging, and the pictures of existing telehealth spaces supported their learning.

After paving the way with H5P hotspots in Telehealth 101, NNLM plans to use the H5P image hotspot in future classes to promote self-directed exploration for learners. H5P image hotspots have subsequently been integrated into two additional classes. One class uses hotspots to explore vocabulary terms related to gender. Another employs hotspots to showcase examples of easy-to-read health information material.

Conclusion

With more classes in higher education being taught fully online or via hybrid modalities, using the image hotspot provides new ways of learning. The H5P hotspot tool offers an additional and accessible means of engaging learners that can be used in various online learning experiences. H5P Image Hotspot is an excellent tool to consider integrating into library instruction via learning management systems. It integrates with common systems used in higher education, including Moodle, Canvas, Blackboard, and LibGuides. It is free and open source and has many accessible content types. H5P can be used to explore physical spaces, highlight passages of text, or parts of a website, such as highlighting common aspects of a research article or critical features of a database.

One unexpected result of using hotspots is the ease of maintaining and editing them. As the telehealth in libraries space continues to develop, changes may be necessary to these image hotspots. While building these image hotspots is more work up front, maintaining them over time is as simple as a quick image, hotspot, or text edit in H5P. This makes image hotspots a good option for delivering content in a unique way

that is also easy to maintain as time goes on. Overall, H5P is an effective, easily maintained, and accessible tool that librarians can use to engage learners and encourage them to virtually explore physical spaces, topics, and ideas.

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