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Building a scalable mobile library orientation activity with Edventure Builder

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Abstract

Purpose – The purpose of this paper is to discuss the technical aspects of using the Edventure Builder platform to create UC San Diego's scalable, interactive, online library orientation activity, which was designed for the university's new First Year Experience program.

Design/methodology/approach – This paper examines a case study using a successive approximation model for the build process of a mobile library scavenger hunt.

Findings – The Edventure Builder software is intuitive, scalable and provides a variety of options to users, including flexibility in question format, a WYSIWYG interface, and branching logic. The main limitation is that analytics is still in beta testing and users must request that data be sent in an Excel spreadsheet via e-mail.

Originality/value – This paper is of interest to information professionals who would like to create a mobile library orientation activity using the Edventure Builder platform.

Keywords Information literacy, Library instruction, First Year Experience, Library orientation, Online scavenger hunt, Successive approximation model (SAM)

Paper type Technical paper

Background

The need to build a scalable online library orientation activity arose when the Provosts at UC San Diego piloted a First Year Experience (FYE) program during the 2014-2015 academic year. Included in the original ideas for the FYE course was a 25 minute time slot for librarians to provide information literacy instruction through online lectures and webinars. After many discussions with the Provosts and campus leaders, instruction librarians from the Learning Services (LSV) department were able to modify this idea to instead focus on a general library orientation module, moving away from traditional information literacy instruction due to the lack of a research-based assignment in the course. Several components made up the FYE library module, including a short in-person lecture and a homework assignment where students created a public service announcement highlighting their favorite library resource or service; however, the most time-intensive component created for the module was an interactive mobile scavenger hunt. Approximately 120 students from each of UC San Diego's six colleges enrolled in the FYE pilot. If, at the end of the two year pilot, the FYE program is required for all incoming freshmen and transfer students, the scavenger hunt will be completed by tens of thousands of students, which meant that scalability was a significant factor when selecting a technology for the library activity.

Selecting a technology solution

To offer a mobile scavenger hunt to students, librarians required a software application that would work on a variety of mobile operating systems and devices. The activity needed to be web-based as a downloaded application could be a barrier for some

students, and it needed to have a short learning curve in terms of usability since the development timeline was limited to eight weeks. The software also needed to be scalable in terms of the number of students who could potentially use the application in the event the pilot was a success and opened up to more students in the future and require little maintenance once the scavenger hunt was built. Additionally, non-software programmers would be creating and maintaining the activity for the library, which necessitated a hosted service due to the lack of internal technical support.

In looking at scavenger hunt applications, it was immediately decided that GPS technology would not be a good solution as it does not lend itself well to a multiple story building such as the UC San Diego Library. Instead, educational gaming platforms were considered and Edventure Builder was the best choice for meeting the activity's requirements (Green Door Labs, 2015). Not only is the Edventure Builder platform web-based and completely customizable, the pricing model is dependent on the number of games that are licensed. This means that we could pilot the technology with a minimal investment and, if successful, keep the same pricing model regardless of the number of students who may participate in the FYE in the future.

Design process
Given the short project timeline, using a model such as ADDIE (Forest, 2014) that requires one to work through several phases consisting of analysis, design, development, implementation and evaluation was impractical. Past experience working with ADDIE supports criticisms that describe it as "too systematic, that it's too linear, too inflexible, too constraining, and even too time-consuming to implement" (Kruse, 2009). Allen points out that "[w]hile ADDIE has been shaped and reshaped into something of a cookbook for developing instructional products," its focus on process details often leads designers to lose sight of the important details within the phases that follow design (development, implementation and evaluation) (Allen, 2012). These phases need to be carefully crafted, taking into consideration feedback from stakeholders from the beginning, to create an efficient design process. The design process used for the FYE project loosely followed Allen's successive approximation model (SAM), which is an iterative process structured around phases of evaluation, design and development (Allen, 2012) (Figure 1).

The iterative development process encourages a shorter timeline to deployment, and evaluative feedback is given more immediately so that changes to the design can be incorporated on a timelier basis.
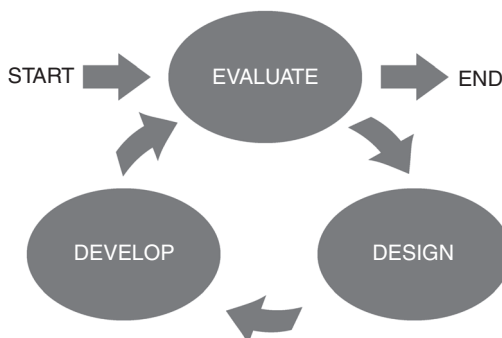

Figure 1.
SAM model

The overarching learning goal for the library's portion of the FYE was to help incoming freshmen become aware of and gain familiarity with the library. The first phase of the SAM model of evaluation consisted of determining what aspects of the library's services and spaces an incoming freshman would most value in terms of acquainting themselves with the library. To identify these, a team of librarians from the LSV department brainstormed what services and spaces a freshman would most likely need to be familiar with during the first few weeks of classes. For instance, a freshman would likely need to know how to look up course reserves, find information and reference service desks and locate the library's hours on the library's website.

Additionally, the evaluation included aspects of the technology that went beyond the initial technology assessment used in selecting Edventure Builder as the scavenger hunt platform. Given the mobile nature of a scavenger hunt, it was important to consider in the evaluation phase technological issues relating to usability. Questions associated with how students would access the URL from their mobile device, would there be a student cost associated with data fees for doing the scavenger hunt, and what if students do not have a mobile device were asked. Answers to these questions led to additional development tasks like the creation of a paper version of the activity.

During the second phase of the SAM model of design, librarians collectively created the list of individual tasks that would comprise the scavenger hunt as well as identified which pieces of demographic information would need to be collected so that the LSV department could provide faculty with a list of student completions. With these tasks in hand, the project moved to the third phase of the SAM model through the development of a storyboard that mapped out the movements students would take as they worked their way through the library during the scavenger hunt. This mapping served several purposes. The first is that the storyboard created a visual prototype of the scavenger hunt that enabled the evaluation of potential disruptive impacts on library services. It also made it possible for the team to create a logical order of movement throughout the library building. A smooth student movement path from one area of the building to another was important in building student confidence with navigating an eight floor structure. A disjointed path would have created a feeling of being lost and undermined the goal of familiarizing students with the library.

Visualizing the workflow also assisted with the implementation of the development process and implementation of a paper version of the scavenger hunt for students without access to a mobile device. To prevent the added workload of manually collecting paper copies, it was decided that students would input the answers they recorded from their paper copies online using one of the library's computers.

At this point in the design process, after spending just a few hours and with no actual work having been started in the Edventure Builder platform, the design workflow had already moved through one iteration of the SAM model. To visualize the circular nature of the SAM design model and how it was used in the build process, an overview of the steps taken follows:

(1) evaluate: what aspects of the library would a first year student need to be aware of during the first few weeks of school;

(2) design: the list of individual steps that would be included in the scavenger hunt;

(3) develop: storyboard the flow of steps; and

(4) re-evaluate design sequencing based on the storyboard.

The use of the SAM model created a process in which potential issues were identified and addressed prior to the actual build in the Edventure Builder platform. This saved valuable time in the overall development and deployment of the activity.

One critical design decision that came out of the development process was the decision to use validation codes as a way for students to report having located a specific service point. It was important for service points like the Information Desk or the Research Assistance Desk to be able to function as usual without interruption from students completing the scavenger hunt. To avoid disruption to service point locations, signs were posted at these locations that would allow students to input a validation code. The validation codes were numerical to reduce the need to create numerous answer possibilities associated with spelling variations. The use of validation codes enabled students to report having been to the location without interfering with the work that was occurring.

Development process

Based upon activity requirements that were identified in the evaluation and design phases, the build of the scavenger hunt in the Edventure Builder platform took advantage of the application's branching logic. Based upon mobile device variances identified in the analysis phase of the design process, it was determined that the scavenger hunt could be completed in one of three ways: via a mobile device that could capture photos for input, via a mobile device that could not capture photos for input, or via a paper version that required students to transfer their written answers to the online version using the library's computers. Students who selected the camera capture option were directed down an activity path that included questions that would enable students to do just that: answer a question by taking a picture. Students who selected a non-camera capture option were directed down a non-camera path that required students to describe a location using text input.

To construct the branching logic in Edventure Builder questions were created with three completion options given. Then each answer option was linked to the appropriate next step. In this way, the next step a student received was predicated by the answer selected. This ability of Edventure Builder allowed librarians to sort students appropriately down selected paths based upon mobile device ability and other program requirements (Figure 2).

This unique feature of the platform enabled choose your own adventure style activities which would allow for the creation of self-directed learning games.

The Edventure Builder application is flexible and allows customization of colors, URLs, and content. The platform utilizes a user-friendly WYSIWYG interface that gives non-programmers the ability to create gaming content. Videos and images uploaded to the gaming platform are uploaded as links from video or photo sharing sites or internal library servers. The creation of the scavenger hunt activity occurs in real time and with unlimited edits. This feature of the platform is extremely helpful when designing the branching logic as pathways, links, videos and other content can be tested immediately upon creation.

Testing

Prior to activity deployment, the scavenger hunt went through several rounds of testing specifically to test Wi-Fi connectivity issues, variances in devices, and branching logic. Following standard practices in usability testing, a testing plan was created and included the use of user profiling as a way of identifying the various branching paths a student

Figure 2.
Branching Logic

may take (US Department of Health and Human Services, 2016). The testing plan required volunteers to test the branching logic of 22 different branching pathways or profiles. To accomplish this, volunteer testers selected from our library staff were sent an e-mail that included a link to the scavenger hunt, a testing profile and a link to a feedback form to gather information pertaining to potential errors or difficulties and general comments. The testing profiles provided each tester with a specific branching path to follow that included information on how a specific question should be answered and which next step should be encountered based upon a given selection. In this way, a tester could determine if the correct sequence of steps and questions were being served up based upon predefined selections and report those findings through the use of a feedback form.

Moreover, testers were sought out based upon what type of device would be used to complete the scavenger hunts. This was done not to test the operating systems of the devices as the platform is web-based but to ensure that testing included camera capture, non-camera capture as well as the no device option. Having a wide assortment of testers also provided feedback on how the directions and wording of the activity was understood by a variety of individuals. As a result of the testing feedback, one task was moved from outside the library building to inside because some of the testers in the

general feedback reported slow upload of photo capture answers related to Wi-Fi connectivity issues on campus.

The testing also resulted in the decision not to randomize the sequence of questions or steps the students had to complete to make it easier for students who were completing the paper activity to do so efficiently. It was important that students using the paper version were not made to feel uncomfortable because they did not have a mobile device.

Implementation

As the scavenger hunt is created in real time, implementation of the activity did not require a specific launch process or migration from a testing environment to a live environment. However, it did require a clear and final decision as to when development and testing would stop in order to "freeze" the activity as a final product.

During the first several weeks of the quarter, FYE students visited the library with their teaching assistants (TA). A train-the-trainer session was held for TAs beforehand to ensure the TAs understood how students were to complete the assignment and answer any technical questions that might come up. For instance, if students used the same browser they could start and stop the same game at any time.

Analytics

The Edventure Builder platform includes basic built-in analytics in the form of online reports. The reporting tracks the number of users and the time period in which the game or activity is used. It is important to note that each time a user accesses the URL the system creates a unique user. For reporting purposes, this means the number of unique users is not necessarily the number of individuals who used the system. There could be duplicates. An example of this occurring is when a user starts the scavenger hunt on their iPhone but does not finish it. Later, the same user starts a new scavenger hunt on their iPad and does finish it. This one individual has created two instances of unique users.

The application also provides information on completion numbers for the entire activity as well as completion numbers by step. Comparing how many users have reached a step to the number of users who actually completed the step can provide evaluators with the ability to quickly determine if a specific step in the activity is proving difficult for the user population as a group.

By building in pre- and post- evaluation questions, LSV was able to assess how well the activity met the learning goals of familiarizing first year students with the library. As a pre-question, students were asked to rate their comfort with using the library and its resources on a scale of 1 to 5. At the end of the scavenger hunt, students were again asked to rate their library comfort level. These added questions provide activity designers with assessment data that informs them on how well the scavenger hunt activity worked as an active learning exercise for library orientations.

The analytics in Edventure Builder is in a beta version and lacks the ability to query or filter results. To make the analytics work in terms of being able to report out to faculty which students completed the activity, LSV librarians requested the data be sent to them by the Edventure Builder staff in an Excel spreadsheet. This enabled data, namely the names of students and which college they were enrolled in, to be filtered and sent to the appropriate college contact.

Maintenance

Other than minor changes to steps based upon design decisions, the maintenance of the application is minimal. As a hosted service platform, Edventure Builder maintains

the technology. The only maintenance that LSV does routinely is to run through the scavenger hunt once per year to ensure that information is still accurate and links are current. This is done in the summer prior to the fall term. In an effort to keep changes to the scavenger hunt questions nominal, LSV strives to incorporate information and or links that are unlikely to change. As there is no limit to the number of participants who can participate in the scavenger hunt, there are no technical requirements that need to be made to accommodate an increase in student use. However, we do announce to library departments and services that there will be an increase of library traffic during the time the activity takes place.

Evaluative feedback

The library activity had an 87 percent completion rate among FYE students, the largest number of whom completed the activity using a smartphone. Both before and after the activity, students were asked about their comfort level using the library, and the FYE program also coordinated a pre- and post-course survey that questioned both students' interest in learning about specific topics and their current understanding of those topics. The library was included in these questions.

When asked at the beginning of the FYE course about their desire to learn about the library, students responded positively, with 80 percent agreeing or strongly agreeing (Figure 3).

Students were also asked to rate their knowledge and skills with regard to using the library pre- and post-course. Overall, students reported an increase in their library knowledge and skills after the library activity. In the pre-course survey, only 12.5 percent rated their abilities as high, the majority of students (62.7 percent) rated their abilities as neither high nor low, and nearly a quarter (24.8 percent) rated their library abilities as low. By the end of the course, 61.1 percent of students now ranked their library knowledge and skills as high, 36.3 percent were neither high nor low, and only 2.6 percent believed their library skills remained low (Figure 4).

Finally, when students were asked to rank their comfort with using the library on a scale of 1-5, there was a 27 percent overall increase in comfort after the FYE library activity. During the post-evaluation, 48 percent of FYE students reported an increase of 1, 14 percent had an increase of 2, and approximately 1 percent each had an increase of 3 or 4. About 34 percent of students experienced no increase in their comfort with the library, 2 percent had a decrease of 1, and 0.5 percent had a decrease of 2 (Figure 5).
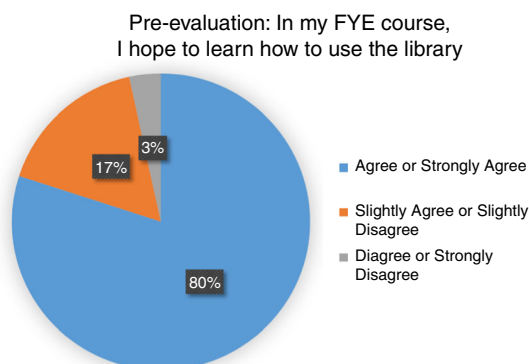

Pre-evaluation: In my FYE course,
I hope to learn how to use the library

■ Agree or Strongly Agree

■ Slightly Agree or Slightly Disagree

■ Diagree or Strongly Disagree
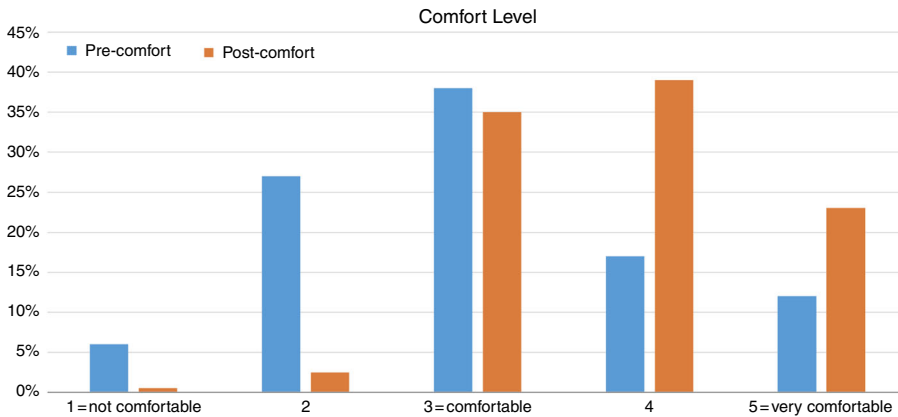
Figure 3.
Pre-activity survey

Figure 4.
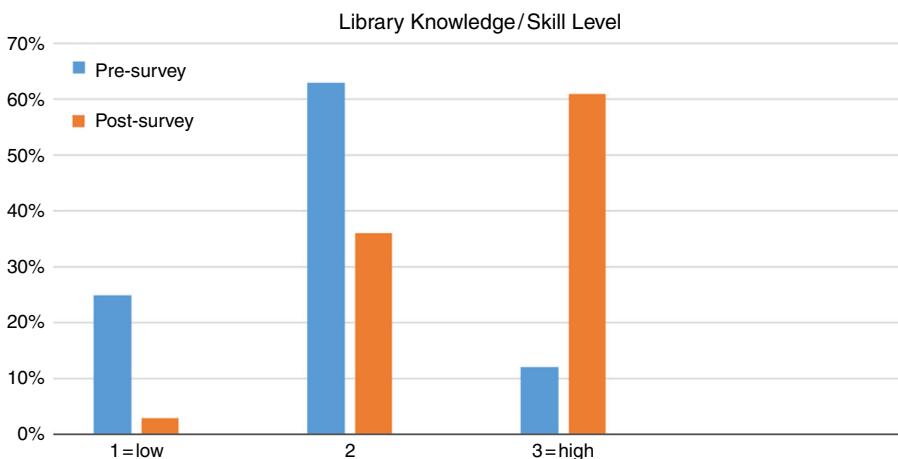Comfort level with
using the library

Figure 5.
Library knowledge/
skill level

Summary

The short implementation timeline for this library scavenger hunt meant that using the
SAM model for evaluation, design and development proved a successful choice for LSV
librarians. A more rigid or time-consuming design model, such as ADDIE, would have
made an already challenging scenario impossible.

Overall, LSV found the Edventure Builder software intuitive, and it provided a
variety of useful options to activity designers, including flexibility in question format,
a user-friendly WYSIWYG interface, and branching logic that allowed for multiple
pathways for students with different devices. The main limitation of this software
platform is that analytics is still in beta testing and activity designers must request that
data be sent in an Excel spreadsheet via e-mail. LSV librarians have found that this is
not an untenable problem, but other institutions might conclude otherwise based on
their unique needs.

References

Allen, M. (2012), *Leaving ADDIE for SAM*, ASTD Press, Alexandria, VA.

Forest, E. (2014), The ADDIE model: instructional design, educational technology", available at: http://educationaltechnology.net/the-addie-model-instructional-design (accessed July 15, 2015).

Green Door Labs (2015), "Edventure Builder", available at: www.edventurebuilder.com/ (accessed July 15, 2015).

Kruse, K. (2009), "Introduction to instructional design and the ADDIE Model", available at: www.transformativedesigns.com/id_systems.html (accessed July 28, 2015).

US Department of Health & Human Services (2016), "Planning a usability test", available at: www.usability.gov/how-to-and-tools/methods/planning-usability-testing.html (accessed July 15, 2015).

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Amanda Roth is the Instructional Technologies Librarian at the UC San Diego, Library. She uses her experience with website design, information architecture and knowledge of user experience best practices to create and deliver information literacy instruction through the use of e-learning objects. Amanda Roth is the corresponding author and can be contacted at: a4roth@ucsd.edu

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Crystal Goldman is the Instruction Coordinator at the UC San Diego Library, and serves as the liaison between the library and the university's six writing programs, as well as the campus First Year Experience Program. Her research interests include instruction, reference, scholarly communication, and the concept of "library as place."

Lia Friedman is a librarian and advocate based in southern California. Currently she is Director of Learning Services at UC San Diego Library, Staff Librarian for Make/Shift magazine; and in perpetuity, an ocean lover. Lia was recognized as a 2009 "Mover and Shaker" by *Library Journal*.