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One tutorial, two universities: How technology can be adapted to meet the needs of multiple libraries

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Introduction

How many times have you participated in this scenario?
> *Student: I can't find this article in the databases (he shows you a citation).*
> *You: Oh, this citation is for a book. Let's check the catalog.*

Understanding citations is a core information literacy skill. While most students understand "giving credit where credit is due," they struggle with the mechanics of creating citations. Discovery tools and databases make it easy for a student to copy and paste citations into a bibliography without ever understanding the different types of sources and that each type has its own citation elements. The 2010 study by Mages and Garson showed the "need for high-quality online citation instruction" (p. 145). To engage students in learning about citation elements, librarians and technology specialists at Marquette University (MU) and Grand Valley State University (GVSU) created an interactive tutorial using drag-and-drop technology that can be used online or in the classroom. The tutorial helps students identify the elements of a citation, place them in correct order, and distinguish among different citation types. When students recognize that books, journal articles, and other sources have particular elements in a particular order, they are on their way to learning how to write properly formatted citations on their own.

In this paper, we will share how MU first created the tutorial, how GVSU adapted the tutorial, and how it evolved over time. We will discuss our experiences deploying and marketing the tutorial, including how we changed it in response to feedback from students and faculty. The tutorial is available as an open source download and can easily be customized. We hope this paper will spark thought and conversation around other applications for drag-and-drop technology in supporting information literacy and foster cross-institutional collaboration.

Development

In 2012, MU librarians developed an opening activity to be used in information literacy sessions for the First Year English program. The activity was intended to introduce some of the topics covered during the session and offer a quick self-assessment to test students' knowledge of publication types and Modern Language Association (MLA) citation style. To make the activity engaging, the librarians worked with an instructional designer who used HTML and jQuery to create a web-based drag-and-drop tutorial. The tutorial required students to identify the elements of a publication needed for an MLA citation by dragging the elements from a screenshot of a database record to labeled boxes (Figure 1). Students were also asked to identify if they were working with a book chapter, journal article, or popular article.

Figure 1: Screenshot From MU's First MLA Tutorial

Feedback from students and librarians indicated there was potential for using this tutorial not just as an icebreaker but as a graded assignment. However, assessing this version was not possible. In 2013, the MU Library purchased a license for Articulate Storyline, a desktop program, to author interactive e-learning content. MU librarians realized this tool would allow for the creation of a tutorial that could be exported as a SCORM package. SCORM, Sharable Content Object Reference Model, is the set of standards that enables online tutorials and learning management systems (LMS) to interact. The SCORM package could then be imported into each freshman English course site in Desire2Learn, MU's LMS. Utilizing a SCORM package in an LMS allowed instructors and librarians to see which students in the course completed the citation tutorial, what individual students got right or wrong, as well as how much time each student spent on the tutorial. This level of data provided a more robust assessment picture.

Since teaching students about citations is such a widespread activity, MU decided to share the tutorial with others in the profession. To allow other libraries to utilize and build upon the tutorial, MU made the code open source. This engendered discussion with library and university administration, because such a decision has both political and legal implications for the university. The concept of open source is a discussion which is beyond the scope of this paper. According to Lindberg (2008), it is one of the most misunderstood concepts in the computing industry. We recommend Lindberg's book, *Intellectual Property and Open Source*, especially Chapters 8-10 for an in-depth, yet accessible explanation of the concept.

The MU library already had a GitHub site. GitHub is a popular and widely-used code sharing site, so using it to host the files was an obvious choice. The source files were licensed using version 3 of the GNU General Public License (GPLv3). An appealing aspect of GPLv3 is its reciprocal or viral nature. If GPLv3 licensed code is incorporated into an application, the new application is "infected"— its source code must also be made freely available, unless the code is reserved for personal use or used only within an organization (Lindberg, 2008).

A GitHub page (http://marquetterml.github.io/information-literacy-modules/) for the project was developed and the Articulate Storyline files were added to it, allowing anyone to try the modules and determine if they would like to utilize or build upon the source files.

In 2014, GVSU learned about MU's tutorial and requested permission to adapt it. Using Storyline, GVSU developed two tutorials—one structured like MU's MLA tutorial and another for the American Psychological Association (APA) style. GVSU librarians originally intended to use the tutorial as a "stand-alone" lesson on creating properly formatted citations, but feedback from a beta test with GVSU librarians and student research consultants indicated the tutorial lacked context and left students wondering what they were supposed to learn. The GVSU librarians struggled with this, and ultimately added example citations and embedded short videos for students to view before doing the drag-and-drop activities. Another drag-and-drop activity was added, requiring students to place citation elements in the correct order (Figure 2). This provides students the opportunity to apply the concepts learned as a final review.

Figure 2: Screenshot From GVSU's APA Tutorial

GVSU provides a link to the tutorial so students can complete it on their own and a SCORM package for instructors to upload into Blackboard, GVSU's LMS (http://gvsu.edu/s/07H). GVSU librarians chose a Creative Commons NonCommercial-ShareAlike license, and the Storyline files are available upon request.

The work that GVSU did in expanding the original MU tutorial confirmed what MU librarians heard in an informal conversation with an English instructor—that the tutorial should have more emphasis on citation formatting and creation and should be about more than just correctly identifying the elements and source types. For this purpose, MU expanded the GVSU tutorial with eight examples for students to work with. The first four examples are "forced correct," which require students to correct errors in order to advance. The second four sources are a graded quiz, and students may earn up to three points for each example. MU added web sources for students to use in order to reflect an emphasis on digital media in the freshman English program.

MARKETING AND DEPLOYING THE TUTORIAL

The MU efforts to promote the tutorial, and to have it used, were initially haphazard. Eventually other tutorials were developed for the English program and promotional efforts became more coherent. MU Libraries marketing efforts have included:

- Presenting them to new graduate student English instructors during the August orientations. This includes modeling their use as part of the library instruction.
- Creating a webpage with demo versions where instructors can try out the tutorials.
- Asking for feedback on them, and the entire library curriculum, in surveys.

At GVSU, marketing efforts focused on these areas:

- Presenting the tutorial to GVSU faculty members at our annual Teaching and Learning with Technology Symposium in 2015 and 2016. This has been the most effective means of making faculty aware of the tutorials.
- Meeting with faculty members who had expressed frustration with their students' understanding of citations and poor skills in creating properly formatted bibliographies. These faculty members have provided invaluable feedback on how the tutorial affected improvement in students' citation skills.
- Promoting the tutorial in the libraries' online citation guides and subject guides.

The versatility of the MU and GVSU tutorial allows a number of options to engage students in learning this material: The tutorial can be used in class or outside of class as homework or extra credit; it can be used with a mouse, touch-screen, or interactive whiteboard; it can be accessed directly from public webpages (research guides) or installed in an LMS. The LMS installation has been a popular option with our faculty members.

CHALLENGES AND LESSONS LEARNED

Creating each iteration of the tutorial took place over several months for both institutions and evolved and improved based on successes and failures along the way. Some notable difficulties included:

- Browser issues: Browser updates and user settings within a browser may prevent the tutorial from working. The tutorial must be tested on different devices and with different browsers.
- Assessment: GVSU used a Google survey at the end of the tutorial. However, Google surveys turn off after a given amount of time—a hard lesson learned after missing potentially important data.
- Currency: A perpetual problem with the tutorial is keeping the information current. While the APA manual is currently stable, the eighth edition of the MLA style manual was recently published. Thus, the MLA tutorial and videos will need updating.
- Compatibility with mobile devices: Although the tutorial is compatible with mobile devices, there are variables that may affect a user's experience. For a complete explanation of mobile support, please refer to the vendor's pages for Storyline and Storyline 2.
- Accessibility: Future versions need to accommodate users with visual or mobility impairments by providing transcripts and audio tracks. While participants may progress through the tutorial using either the mouse, touchpad, or keyboard, there are some screens where keyboard mobility does not occur.
- Upfront costs and personnel: Libraries need to make a significant initial investment to purchase the Articulate Storyline software in order to edit or enhance these modules. Though the software is not difficult to learn, it still requires an investment of time and personnel.

Because MU and GVSU are mutually invested in the success of the tutorial, we continue to collaborate to solve challenges that arise. We are helping each other and sharing expertise and knowledge, which ultimately improves the quality of the tutorial.

STUDENT SURVEY RESULTS

MU and GVSU collected feedback from students to assess if the tutorial helped them learn about citation elements, put the elements in the correct order, and identify types of sources. MU surveyed students in Fall 2012, and received 880 responses to questions where students self-reported on how much the tutorial helped (very helpful, somewhat helpful, not very helpful, or not at all helpful). MU also collected a small sample of SCORM data in spring, 2016, from two sections of a freshman English class. GVSU surveyed students from May through October 2015, and received 135 responses to Yes/No questions. The most significant data is highlighted here. For more details, please refer to the Appendix.

There was only one question that both institutions asked which is more or less identical in intent, and which resulted in fairly similar answers from students: Did the tutorial help students learn to identify citation elements? As shown in Table 1, students generally felt that the tutorial helped them to recognize the elements of citations better.

Table 1: Tutorial Helped Students Identify Citation Elements

Both MU and GVSU wanted to create a tutorial that would actively engage students and not require a big investment in classroom or homework time. As shown in Table 2, most GVSU students completed the tutorial in 10 minutes or less; MU students averaged 34 minutes or less. The significant difference between the lengths of time spent at our two institutions is attributable to the length of the tutorial and how the time was reported. The GVSU tutorial has three examples for students to work through and time data was self-reported. MU's new APA tutorial has eight examples and time data was collected from the LMS. Based on this, time data from the LMS can only be considered approximate. The LMS calculates the times based on when a student first clicks on the tutorial and when they finally finish it; it cannot tell if students are multi-tasking. Even with a 30-minute investment of time, we are encouraged by survey responses that the tutorial was helpful.

Table 2: Time Required to Complete Tutorial

FACULTY SURVEY RESULTS

MU and GVSU solicited feedback from faculty members informally via email and in-person conversations. We asked instructors who had installed the tutorial in the LMS to provide information about how they incorporated it into the curriculum. We found out that all of the faculty members at both schools asked students to complete the tutorial outside of class. With one exception, all faculty members gave students credit for completing the tutorial.

Faculty members at both schools like the visual and interactive nature of the tutorial. However, when they were asked about the success of the tutorial in student learning, the early versions received mixed reviews. At MU, it was used primarily as a bell-ringer activity at the beginning of library instruction sessions, and it was not well integrated into the session's curriculum. At GVSU, the tutorial lacked context. Table 3 highlights comments received from faculty that illustrate how the tutorial has evolved and improved.

Table 3: Quotes From Faculty Surveys

Faculty members at both schools suggested including more examples for students to work on, including finding a source, finding the appropriate elements, and manually creating the citation. One helpful comment stated that:

> Not every source students use has citation information in one place. Could there be a version where they must search through a "webpage" for the information and then put it in the appropriate boxes? Perhaps have more sections highlighted so students can learn to differentiate between information that is needed and supplemental information?

CONCLUSION

Serving an increasingly diverse patron population with fewer resources and staff is the new normal for 21st century libraries. The constraints of this lean model require innovative approaches to solving problems (Mullins, 2014). This project is an example of how two different libraries can benefit from collaborative development (Mullins, 2014; Pan, Ferre-Vinent, & Bruehl, 2014; Sankey & Hunt, 2014). Both libraries were trying to solve the same problem, how to instruct students on citation format in an interactive and engaging way. The benefit of a collaboration such as this is that when more people look at a problem, more effective and innovative solutions can be found. Grand Valley State University libraries were able to take the initial tutorial and enhance it to meet their needs. That in turn made a better tutorial and inspired Marquette to build upon that work and add even more useful enhancements.

The great architect Frank Lloyd Wright once said, "Man built most nobly when limitations were at their greatest" (Roberts, 2010, p. 105). Despite the limitations and challenges, projects such as these offer great opportunities for innovation. Please view this article as a call to action and collaboration. We invite you to join us in the continuing evolution of this project.

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APPENDIX

MU Data

After developing the third iteration of the tutorial at MU, some data was collected from the LMS for two sections of the freshman English class; this data is from spring semester 2016:

Section	# of students in section	# of students who 'visited' tutorial	# of students who completed tutorial	Average time spent (minutes)	Average score (percent correct)
A	18	14	12	34:16	83.3
B	18	13	9	23:46	73.3

GVSU Data

GVSU included a link to a Google survey at the end of the tutorial and completion was voluntary. We received 135 responses from May-October 2015:

Question	Answer	Responses N (%)
How did you find this module?	Class Assignment	120 (88.9%)
	Library Website	3 (2.2%)
	Other	12 (8.9%)
Which module did you complete?	APA	130 (96.3%)
	MLA	2 (1.5%)
	Chicago	3 (2.2%)
Do you feel that you are better able to identify the parts of a citation after completing the module?	Yes	132 (98.5%)
	No	2 (1.5%)
Do you feel that you are better able to identify the types of citations (books, journal articles, etc.) after completing this survey?	Yes	128 (94.8%)
	No	7 (5.2%)

Selected comments from GVSU students:

- "I would rather just look at Diana Hacker or Purdue Owl to learn the parts of a citation."
- "I do not think students would willingly do the module if it wasn't an assignment."
- "Very helpful don't change anything."
- "This is helpful in understanding APA maybe make the videos not as long."
- "I liked it."
- "Thought it was very helpful."
- "Provide more elements of the book that are not included in a citation."

Images for Tables and Figures (Editor will put in body of the text later)

Figure 1

Figure 2

Table 1

Do you feel better able to identify the elements of a citation after doing the tutorial?	MU (fall 2012 survey; 880 respondents)	GVSU (May-October 2015 survey; 135 respondents)
Yes/Very helpful/Somewhat helpful	82.7%	98.5%

No/Not very helpful/Not at all helpful	4.8%	1.5%
I did not do it	12.5%	NA

Table 2

Institution	Time	Responses N (%)
GVSU 2015 survey	5 minutes or less	83 (61%)
	6-10 minutes	48 (36%)
	More than 10 minutes	4 (3%)
MU 2016 LMS data	Average time 24 minutes	9 (43%)
	Average time 34 minutes	12 (57%)

Table 3

Institution	Comments Received
MU Fall 2012	"The opening exercise didn't seem to help with them recognizing and applying proper MLA citations. It was an activity without qualification or grounding in some respects."
GVSU Summer 2015	"Even though students completed the activity they struggled with APA. Some did well another's [*sic*] did not. Hmm! My inference or anecdotal comment is that even though students did the activity they did not retain."
GVSU Winter 2016	"The APA tutorial provides guidance to students and has helped to field any APA issues from the start of the [assignment]. This has helped the instructor. Additionally when students inquired about other APA questions the instructor referred student to the tutorial for review."
MU Spring 2016	"The new format has a really good affect [*sic*] on pacing. It also makes the tutorial more of a lesson. I see this tutorial more easily integrating into [a freshman English] class period or homework assignment because of its overall increased length and quiz"