Going Open: A Textbook Replacement Design Case

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Abstract: This paper reports the design case of a shift from a traditional textbook to OER in an undergraduate educational technology course. Reporting on the initial needs analysis through the formative evaluation of the beta version, this case documents the design and development decisions that were made. Findings show that students were more likely to engage with the OER than the traditional textbook. Lessons learned focus on the conceptualization of "book" and how to design with the full range of open educational sharing in mind.

Introduction

In the last decade, multiple issues have converged to make the development and use of open educational resources (OER) in the university classroom a priority for many faculty members. The Internet serves as an efficient storage and distribution mechanism, facilitating widespread sharing of learning materials. The rising cost of textbooks has become a concern in higher education, and many university students are suffering from financial issues such as housing and food insecurity (Broton & Goldrick-Rab, 2017). Students alternately go without textbooks or make course selections based on textbook costs (DeMartini, Marshall, & Chew, 2018). The contemporary generation of college age students is well known for seeking information online and for accessing a variety of media via mobile devices and computers (Lenhart, 2015; Scolari, Masanet, Guerrero-Pico, & Establés, 2018). They are willing to use digital texts and hold positive views of OERs (Abramovich & McBride, 2018). This paper shares a design case that responds to the student need for affordable learning materials and preferences for using online resources. In this design case, we describe the process of switching from a traditional textbook to OER.

Background

The course for which the open textbook was developed is an applied technology integration course for undergraduate students. This course, EME2040: Introduction to Educational Technology, meets in a computer lab. In the lab environment students in this course tend to focus on the software learning portion of the course objectives, but equally important are the learning objectives focused on technology integration knowledge and

design skills. Course assignments both require students to perform specific skills on the computer and to reflect on how computers can be used to support a variety of activities (e.g., learning, organization, management, communication, professional development).

In a typically semester, 6 sections of EME2040 are taught. Enrollments are capped at 25 students per section. The course instructors are advanced graduate students who have at least 18 graduate credit hours in the field and strong technology skills. Typically, about two-thirds to three-quarters of the students in the course are freshmen and sophomores who plan to major in an education-related field. Enrollments skew toward a white, female student population.

The EME2040 course historically has used a paper-based textbook from a major publisher. The course team has transitioned through three different textbooks published by three different publishers during the last decade. Each textbook change was rooted in the desire to find a text with better alignment to the course learning objectives. In addition to the textbook, instructor-created learning resources have been used in this course, including slides, handouts, and podcasts.

The Problem

The course textbook has continuously been a weak spot in the curriculum. In terms of content, we have never found a text that fully aligned with the curriculum. Additionally, technology textbooks rapidly become outdated. The textbook that best met our content needs had several content errors. The cost of the text steadily increased each term, and was around $120 the last term we assigned it. The text had no resale value because it was printed on loose-leaf pages with no binding. Course instructors observed that many students did not seem own or use the textbook. We also recognized the irony of continuing to require students to purchase an expensive paper-based textbook each term, while teaching about and extolling the values of information access on the Internet in general, and Creative Commons licensing and open educational resources more specifically.

The primary advantage of assigning a textbook had been providing consistency across course sections. The graduate student instructors have varying levels of prior experience with technology integration practices and the textbook, and instructor turnover is high. The course team previously considered teaching without a textbook, but that solution would leave new instructors with relatively few content-based materials and could result in reduced consistency across course sections. Additionally, the course team considered simply linking to existing online materials (e.g., relevant videos and articles) from the learning management system, but this approach would leave instructors dependent on external resources that might be deleted, moved, or otherwise altered by other people in the midst of instruction.

The Solution

The solution was to design and develop our own electronic textbook for the course. There were four reasons why we felt this was an appropriate solution. First, it aligned well with OER initiatives on our campus. We were able to apply for and secure a small grant from the University Library to support our development process. The support included a small amount of financial funding, as well as the opportunity to participate in OER workshops and work with librarians throughout our process. Second, after years of supervising the course and using different textbooks the lead designer had some pretty clear ideas about the content that an ideal textbook for this course might include. Third, we were updating the course content and assignments annually, and desired a textbook that would evolve with the course. Fourth, we felt it was important to seize the opportunity to model OER creation and distribution for our students and our colleagues throughout the university.

Our solution provided us with a custom solution and allowed for flexibility. We considered adopting existing OER, but found that, in many cases, what was available fell short of meeting the open resource 5 Rs: retain, reuse, revise, remix, redistribute (Wiley, n.d.). In other words, we could point to and ask students to use items posted online by others, but we could not alter or redesign these items. We wanted to be able to revise and remix content, with materials we could update and expand each term. We chose to create an open textbook using Creative Commons licensing (BY-NC-SA), and to carefully consider how our end product could meet the 5 Rs, maximizing utility for others. We were motivated by our own experience searching for customizable materials; if we were struggling, others must be as well. If a little extra effort on our behalf to design and share OER would benefit others, then the effort was deemed worthwhile.

Needs Analysis

We began the project with an online survey of students to better understand student textbook use and preferences. Students were surveyed at the end of the spring term, before the design and development process began over summer. Fifty-two students responded to the optional survey. We learned that only 32 (62%) purchased the book, and 42 (81%) indicated that they did not read or refer to the text during the class. This meant that some students who purchased it did not use it. Comments suggested that students felt they could find the information they needed via the course podcasts and their own Internet searches.

When asked what they would like in a future textbook, low cost was cited as a key feature (45; 87%). In terms of access, 42 (81%) said they would do readings online, and 9 (17%) said they wanted a low-cost, bound, print-on-demand version. 19 (37%) felt mobile access was very important. Preferred content delivery methods were videos (44; 85%), reading materials (39; 75%), and podcasts (31; 60%). Additional comments suggested that many students preferred to not engage in lengthy readings.

Design and Development

The core design and development team for this project was the course supervisor and the lead course instructor. Additional course instructors provided guidance and feedback, and library staff offered support as well. The design and development process began during Summer 2018, with a beta version of the text launched in six sections of the course during Fall 2018.

The content outline for the textbook was derived from the course syllabus. Additional content needs were identified in a meeting with the course instructors, who provided feedback about what they would like to see covered and who identified areas of the course where students struggle the most. The content outline differed greatly from the textbook that we had been using, further highlighting the poor alignment between text and course. The differences reflected both additions and omissions, as well as a restructuring of content.

Throughout the design and development process, the concept of "book" created a tension for us. In previous semesters, the "book" was a physical item that students purchased, and it contained content with a logical, linear flow. That flow did not necessarily correspond to our course flow, nor did the topics always reflect our curriculum. In other words, "book" and "class" each had their own flow, and that flow did not consistently match. The task was to replace a textbook, and the language we initially used to describe the replacement incorporated the term "book." With the notion of "book" in mind — a concept solidly rooted in a structure that consists of chapters, roughly equivalent in page length and form — we found ourselves stymied by the impulse to replicate elements of the very materials we were choosing to walk away from. Each topic to be covered needed to fit a chapter, and once a chapter topic was determined, sufficient content needed to be developed to flesh the chapter.

Looking at how we actually teach the EME2040 course, we saw how that content that might constitute a single chapter tends to be covered across multiple course meetings, and how supporting the attainment of required knowledge and skills to complete complex assignments could require engaging with content that crossed logical chapters. For example, when creating newsletters our students need to learn about desktop publishing, the role of newsletters in K-12 environments. intellectual property, and visual design. Some of these topics are quite brief (e.g., newsletters), whereas others represent areas that are revisited continuously throughout the course (e.g., intellectual property). We could, of course, wrap it all into a chapter focused on producing the assessed project — in this case, a newsletter — which would be unlike any textbook we had seen. However, this approach takes away the flexibility and potential future reuse by others by suggesting the individuals should use the intact chapter rather than inviting them to use, edit, and add to sections of it in whatever manner best suits their learning needs.

The concept of "book" also led to narrow thinking about the development platform. With an end in mind, we looked at file formats such as PDF and ebook. These file formats further reinforced our thinking in terms of page layouts and chapters. Then we considered

how the learning material would connect to the course itself, which uses the Canvas Learning Management System to deliver course content. At this point, with time moving quickly and the need to produce learning content before the next term began, we shifted our thoughts from "writing book" to "designing course." This decision led us to use Canvas as the development platform, with the caveat that we could revisit the compiled file format question at a later time. However, with time the concept of a compiled version has become less important to us. We watched students in the course fluidly use the individual learning objects. They did not struggle to see the relationship between these objects, and they did not complain about lacking a compiled, linear book.

In Canvas, learning object by learning object, and module by module, we began to develop content. With a tight timeframe, we focused on critical content for the beta version. Much of the content has taken the form of brief (400-1000 word) text-based documents. Surprisingly, writing in short form, focused solely on discrete content chunks with no consideration of flow from a larger chapter, was simple. In many ways, the process was similar to drafting slides and lecture notes for use during a class session. The materials were not solely text-based. For the beta version, explanatory graphics were created and included for some topics. In other topical areas, open access graphics were used and appropriately credited. Additionally, we solicited brief (1-3 minute) video testimonials from practicing teachers focused on how they use technology. Collectively, these content elements provided a sufficient framework for teaching the course without a textbook. The students were able to use the combination of materials and in-class activities to learn the necessary knowledge and skills to complete course assignments. The beta version development process concluded with a list of "nice to have" content for development and inclusion in the next iteration of the materials.

Lessons Learned from Beta Version

The beta version was used during the Fall 2018 semester. At this point, the learning materials were not yet open. Use was restricted to EME2040 courses, with instructors copying the materials from a master course shell into their course sections. At the end of the semester, instructors informally shared that they felt their student had engaged more fully with the learning materials in Canvas than they had with the textbook. This was confirmed via a survey completed by 89 students. Only 13 students (14.6%) indicated that they did not do the readings, which represents a substantial increase in students doing readings over prior terms in this course. The alignment between the readings and the course activities was also clear. Students agreed or strongly agreed that the readings helped them with in class activities (68; 76%) and assignments (68; 76%), and helped them better understand how teachers use technology (72; 81%). Considering the number of students who did not do the readings, this finding suggests that the readings were useful to most students who completed them.

The format seemed to work for most students; only one-fourth of the students (21) suggested that they would have preferred the materials all compiled into a single book rather than dispersed module by module, and students reported accessing the readings across a variety of devices, including their phones. From an instructional perspective, the

ability to make customizations, additions, or corrections seamlessly and as needed was beneficial.

Next Steps: Revision, Addition, and Working Toward Open

Our OER solution, because it was customized for the course, provides better alignment with our course assignments than the previously adopted textbook. In particular, it includes examples of the types of projects that students might create to fulfill course requirements. Because the learning materials are open and we can edit them at any time, it is easy to reflect any updates to software or assignments used in the course. We are continuing to refine the materials, adding learning objects that represent examples and extensions of the base course content. During 2019 we will invite students to submit their assignments as work examples to be included in the textbook. This approach will allow us to always have current examples of projects, which is particularly important given the rapid changes in software programs. In this sense, we are not only using OER, but also incorporating renewable assignments (Wiley, Webb, Weston, & Tonks, 2017) into the EME2040 class. We recognize that in one more term we should have a solid, tested set of learning materials in place, but that we will likely continue to adjust the materials every term.

Completing the learning materials to our own satisfaction is not sufficient. Other steps are necessary to make the materials truly open, which we valued in principle after our own challenges to find existing OER that could readily be modified for use in our class. When complete, the course materials will be shared in full via Canvas Commons. Other instructors and students will be free to use the course design in whole or in part. However, knowing that not everyone can access Canvas Commons we will offer a parallel version of the content hosted outside of the Canvas learning environment. We are not yet sure if that will entail exporting to a SCORM compliant format and submitting to a repository (Day & Erturk, 2017), or hosting on our own server. The full details have yet to be determined, but we are committed to providing truly open materials, meaning that they can not only be adopted by others, but also easily adapted or customized. In order to make this possible, we will need to supply two copies of the course materials to the extent possible – complete or "published" versions for use as-is (e.g., PDFs, videos), and editable versions.

Discussion and Conclusion

We have found that shifting from a traditional textbook to a collection of customized learning objects has been positive in this course. We were able to control the quality and content of the materials, and long-term, we see the benefits of being able to edit, reconfigure, reorder, and add to these learning resources. We should be able to create compiled versions for students who prefer to download and access the course materials as a single unit, and printable versions, perhaps with transcripts in the place of videos.

The OER that we have designed and developed are a custom fit our course, but may not be a perfect match for other educational technology courses. However, we hope that other

instructors and students may find some collection of these materials useful for their own learning experiences. By providing both published and editable versions of the materials, and defining the OER unit at the micro level (e.g., three paragraphs on a topic or a single graphic, harkening back to an earlier trend, the reusable learning object) rather than the macro level (e.g., a compiled collection of unit or course content), more people should find these learning materials useful.

The design and development process pushed us to think deeply about two issues. The first was our own "book" mindset, which was not helpful when creating learning content for the course, and the second was what it means for OER to be truly open and useful to others. Although we had both previously worked with learning objects and had taught course without textbooks, the initial charge had been to replace a traditional paper textbook with an open, electronic one. Applying the concept of "book" to the development of OER was confining, and would have resulted in a less useful, less editable final product. Shifting from a single-unit course material to many smaller units supports flexibility for both editing and overall content flow. Additionally, it was helpful to consider the challenges we would have faced in adopting existing OER when designing our OER. In this sense we designed with two end-users in mind: our own EME2040 students, and instructors teaching their own courses elsewhere.

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