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INTEGRATING THE LIBRARY IN THE LEARNING MANAGEMENT SYSTEM

Amanda Clossen, Editor

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Integrating the Library in the Learning Management System

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About the Editor

Amanda Clossen is the learning design librarian at Penn State, where she coordinates the development of online learning environments. Her research interests include accessible design, metacognition as it applies to library instruction, and student engagement with instructional video.

Abstract

Library resource integration in a local learning management system (LMS) can be streamlined through the application of the Learning Tools Interoperability (LTI) standard, which allows connectivity between the LMS and other learning tools. Despite its convenience, the implementation of an LTI tool can be a complicated process both technically and administratively. This issue of *Library Technology Reports* (vol. 54, no. 5), "Integrating the Library in the Learning Management System," follows the case study of the Pennsylvania State University Libraries' large-scale implementation of Springshare's LTI tool within Canvas. Beginning with the data gathering that guided their strategy, this report will cover the technical aspects of implementation, with a focus on guides and reserves. Their exploration into embedding librarians within Canvas will also be addressed, as well as their outreach and assessment efforts. Through Penn State's experience, major roadblocks and pain points will be illustrated, as well as ways to anticipate and easily overcome these challenges.

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Chapter 1

Introduction

Amanda Clossen

The learning management system (LMS) is central to the educational experience for both students and faculty. Not simply a repository of completed assignments, it is also a space where learning takes place directly, through modules, discussion boards, assignments, quizzes, Learning Tools Interoperability (LTI) integrations, and many other tools. For online and distance students, the LMS is frequently the *only* place where this learning happens.

For all its activity, the functionality of the LMS is rapidly evolving. With this evolution are new tools and methods to bring library services and resources into the place where courses "live." Integration in the LMS provides the library with a front seat to student learning and a vital way to integrate in the process.

There are a wide variety of learning management systems, and it's certain that by the time this work is published there will be even more. However, at the time of this writing, five of the most popular options are Desire2Learn's Brightspace, Blackboard Learn, Instructure's Canvas, Sakai, and Moodle. The LTI integration discussed in this report can be implemented in any one of these systems. Indeed, most systems currently allow for LTI integration, which is the primary way that outside tools and the LMS communicate with each other. Though the look and feel of Moodle integration, for instance, will be different from the Canvas integration, the content remains the same.

Integration History

Integration in the LMS is not a new thing at Penn State. In fact, the Penn State University Libraries were quite innovative and successful in establishing a strong presence within the ANGEL learning management system. This was accomplished over time through extensive customization of ANGEL by the development support team in Penn State's central IT organization. Three main integration points were established: course reserves; guides (course and subject); and later in the product life cycle, integration with Ask a Librarian, our virtual reference service. The key innovation with these integrations was the ability for librarians to connect guides on the library's website to ANGEL courses without an instructor's involvement.

It took a coordinated effort to make this work. The ANGEL team created a custom role in ANGEL for Librarian. Librarians who were granted this role were given privileges to associate distinct URLs for research and course guides with specific courses and sections in ANGEL. To do so, they needed to obtain the exact course abbreviation to use as the connection point. These were not standardized at the time.

A popular feature was the ability for a librarian to link a guide to an entire campus location, college, department, or single class section and to limit access if desired. A generic guide was often provided at a campus location level to provide basic information literacy information for that location. All library content appeared under a tab called Penn State Library Tools. By today's usability standards, this link was poorly placed under a higher-level tab, and students often didn't realize it was available at all.

In addition to guide integration, the library collaborated with ANGEL developers to integrate course reserves reading lists. This was difficult to implement accurately because various sections of a course could have been taught by separate instructors who could each have unique reserve reading lists.

As the libraries' use of virtual reference tools evolved over time, various links to the virtual chat

services were implemented within ANGEL. This was the simplest of all three of the integrations since no course specific connection needed to be made.

These integrations provided listings of library resources within ANGEL and linked out of ANGEL to the specific library content. While the approach was innovative at the time, user experience testing in recent years showed that students were often confused by jumping between the LMS, the library website, database resources, and so on. They wanted a singular experience within their primary system—the LMS.

In the spring of 2015, Penn State began the process of piloting the learning management system Canvas for potential implementation. ANGEL was scheduled to reach end-of-life in December of 2017. As the university as a whole began assessing its learning management system needs, the University Libraries decided to take a proactive approach to our own integration within the final project. At that time, the authors of this report came together and proposed a working group to improve the integration of the University Libraries and the Penn State LMS, which was likely to be Canvas.

This team was charged to provide overall vision and strategy for libraries presence in the LMS. It planned, oversaw, and supported initiatives to integrate library resources within the LMS and market these library resources to course designers and instructors. It also collected stakeholder feedback in order to inform decisions.

This issue of *Library Technology Reports* will provide a case study in the transition from one LMS to another, addressing our navigation of this process, as well as providing recommendations and best practices for other institutions that are in the process of integrating library resources into their own LMSs.

Chapter 2

Tell Us a Story

Canvas Integration Strategy

Amanda Clossen and Linda Klimczyk*

Before the transition from ANGEL to Canvas, there was already a method in place for embedding library content (namely guides) into the LMS. Unfortunately, this method placed library content in a little-used location. Students simply did not see them. The biggest reach of guides in the LMS was when instructors linked the students to guides directly within course content. While this was an excellent way to create instructor/librarian collaboration, there are many instructors who were unaware of the library's resources and how these resources could be usefully integrated into their course.

While these problems were obvious to the University Libraries LMS team from the start, it was entirely possible that these issues were not the only ones experienced by our four main user groups: students, instructors, instructional designers, and librarians. In this section, we will explore the methods used in order to strategize our next steps. These methods—a student survey and the collection of user studies—were vital elements in our decisions regarding library integrations.

Student Survey

In the spring of 2016, a Penn State Qualtrics Survey was sent out to seventy-three students who had taken the course COMM 190: Gaming and Interactive Media. This course was piloting the Canvas LMS before its university-wide implementation. Students were asked a series of questions, some left open-ended in order to include nuance in our results. In order to gather responses, the instructor gave all the students who completed the survey extra credit.

These institution-specific survey questions were as follows:

1. Do you know what a course guide is?
2. Have you ever used subject guides or course guides for a class project?
3. If so, what class was this for? List all that apply.
4. Have you ever accessed a subject/course guide via Angel or Canvas?
5. How often do you use the course guides?
6. How much does it influence work in the course?
7. How are you interacting with guides when a librarian does not prompt you?
8. Have you used course guides on your own when they are available to you?
9. How have your teachers/classmates been using the library through Angel?
10. How does this influence work in the course?
11. Do you want the course guides to be included in a future Learning Management System (LMS) like Canvas?
12. Where would you expect to see options to access course guides on Angel/Canvas?
13. How do you decide if a source is valid (accurate, current, trustworthy)?

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14. How much do you want included on Canvas itself as opposed to through links?
15. How are you finding information for projects right now?

Perhaps the most reassuring and affirming piece of information from this survey was the response to question 11: *Do you want the course guides to be included in a future Learning Management System (LMS) like Canvas?* Eighty-eight percent of students wanted guides to be included in their future LMS. This response included thirty-five students who had never used guides before, yet recognized their usefulness in the process of taking the survey.

General findings included: 53 percent of students did not know what a course guide was; 41 percent of students had used a guide for a class project; 60 percent accessed a course guide via the LMS; and 37 percent of students used course guides on their own.

When students were asked how their instructors or classmates used library resources, a large percentage said that they were not instructed in guide use by their instructors, or if they had been, it was for a single course and not in others. How they were introduced to library content also varied. Some instructors guided them through the process of locating the guides within ANGEL itself. Others had simply linked to the guide in the lessons area of the course.

Responses to the question of where guides should be accessed revealed mixed results. However, the largest number of students suggested that the guides be located on the sidebar as a navigation item. This was a huge step up from the organization in ANGEL, which had the libraries' resources in a difficult-to-find location that required two clicks to reach. In the free response section of this question, some version of the statement "it has to be visible" was repeated over and over. Complaints were made about the inaccessibility of the information in ANGEL. Many students said they might use guides if they knew where they were and realized why and how they should use them.

Students preferred including as much content as possible within Canvas itself, as opposed to through links to other resources. In the free responses, students expressed both an unwillingness to leave the LMS and also a great desire for the LMS to remain "uncluttered." Those who did not want to see guides in Canvas often said that it was because it would be too messy, or too crowded. This affects not only where the guides are integrated, but also what content is put on the guides themselves and how it is included.

Actions

As a result of the student survey, several clear requirements for the Canvas LMS integrations rose to the top. Guides specifically had been seen as useful and should be included in future integrations. It was important that the guides were in a visible place, but not a place that overwhelmed the course content. It was strongly suggested that the guides go into the left-hand navigation. Minor improvements to guide design were suggested. Since students often did not know what a course guide was, obvious titles and descriptive intros were encouraged.

A less technical element was also observed, that being that students were most motivated to interact with the guides if someone directed them to their existence. Responses were split between that someone being an instructor or a librarian; however, in both cases, the student needed a gentle nudge toward the guide. Instructors will introduce students to guides only if they are aware of their existence, as well as if they are convinced that such a tool can be useful. If such an item is implemented automatically (which was the avenue we chose at Penn State), it opens up an excellent avenue for librarians to communicate with instructors on the tools that can be included in their course.

User Stories

Working with several technologies and distinctly different user groups, the University Libraries LMS team needed a method to document requirements and to communicate them across audiences. The libraries have adopted the Agile framework for managing development projects (and more). The Agile framework is a set of values and principles—not processes or tools—intended as an alternative to traditional documentation-driven, linear methods, allowing greater flexibility and responsiveness to user needs.[1] We borrowed one technique in particular, user stories, as a method to further define user needs from various points of view.

> A user story is a tool in Agile methodology that can work for many types of requirements gathering. They are "short, simple descriptions of a feature told from the perspective of the person who desires the new capability, usually a user or customer of the system."[2]

User stories follow the format:

> As a [role] I want [requirement] so that [end result desired].

For example:

> **As an** instructional designer, **I want** an easy and reliable way to embed the library into courses

so that changes in the library databases don't break links in my course.

As a student, **I want** to find everything that I need for my course in one place **so that** I don't miss anything.

User stories are used to paint a clear picture of the actual use cases of a product or service for each target audience. They are clear statements, constructed in plain language (without jargon), that bring needs into focus and reveal similarities and differences between user groups to the product owner and team.

The product owner, another role borrowed from Agile, serves as the primary stakeholder who prioritizes work and has the final say in requirements and acceptance criteria of the deliverables.[3] Another responsibility of the product owner is to group user stories into groups, often called epics. These are sets of features and functions that interrelate together as the deliverable.[4]

In an Agile development environment, the development team designs software to meet the objective and requirements of the user story. Developers are not constrained by any particular development method as long as the deliverable meets the objective laid out in the user story. Stakeholders do not have to understand the technology in order to set requirements. This division of labor between what to do and how to do it brings the team to a middle ground of communication and understanding around the product, allowing each person to capitalize on their own type of expertise.

In Penn State's example, the library team was made up of both technical and nontechnical personnel who also interacted closely with the Penn State Canvas technical team and the Springshare technical team. Additionally, the library team worked closely with stakeholders and consumers of library services.

These groups had very different levels of knowledge on what the library does and can provide. Whether the difference was technical/nontechnical or library/non-library, common understanding was limited between groups, but user stories proved to be a successful bridge to communicate needs and requirements across everyone involved.[5] They also provided a way to keep the project focused and on track. The organization of user stories into epics provided a nice visual of where we were going and where we were at any given time.

Our goal of user stories was to figure out how we could leverage the opportunities of the changing technologies to maximize value to students and instructors.

- Could a new LMS enable assignment-level links to reserve reading assignments?
- Could the new LMS enable embedded content from LibGuides?
- Could we use new technologies to automatically provide topical links between library resources and courses?
- Could we resolve the philosophical difference of bringing users to the library tools and website versus bringing library resources to the users? What experience did users really want?
- Could the LibGuides content and references in Canvas/LMS be customized to help pull students in and encourage use?

We leveraged the energy of the team members, the opportunity to work with a cross-functional team, as well as the possibilities that new technologies bring to define our problem statements: What do students care about? What do instructional designers and faculty want? And what do librarians want to share?

We began by focusing on the gap between what librarians think users want and what users state that they want. We embarked on parallel studies: a student survey, as mentioned in the first section of this chapter, interviews with ID shops, and user story development with stakeholder groups.

Execution

Several user story meetings were held with the following constituent groups: library employees, instructional designers from the college of Information Science and Technology, and the project team.

These meetings were conducted with a facilitator who encouraged participation and recorded user stories in a table in Microsoft Word. This was done on a large screen display of a three-column table with the following headers:

As a . . .

I want . . .

So that I can . . .

The facilitator recorded user stories in real time throughout the session. Participants built on each other's ideas to further define stories or to write new ones. The facilitator had the opportunity to clarify in the moment if anything was ambiguous. The participants were vocal, and pain points were quickly pointed out as well as wish lists.

Often the pain points were not directly related to the project. We recorded them regardless. Later, we were able to use these to inform other projects. One example was the need for a URL generator for linking to licensed database resources using our proxy prefix. This was a small project that fulfilled a large need

that might not have been discovered had we not been gathering stakeholder input.

It became clear that even our instructional designers and instructors weren't always aware of what the library can and does provide. For instance, some didn't know about guides at all. We utilized the opportunity of our user story meetings to provide some "what if's" to seed discussion. An outgrowth of this work was an opportunity for librarians to penetrate the Learning Design network and to provide deeper information sessions on what libraries provide and points of collaboration. This resulted in additional user stories.

Results and Analysis

The analysis of user stories along with survey results shaped requirements of the project. The major requirements were to provide seamless access to library resources within the course for everyone involved in the course, including the instructor, designer, TA, learner, and librarian. The resources had to be easy to find and require little work on the part of course designers to implement. The bulk of the integration and content provision had to fall on the libraries. We couldn't overlook what librarians wanted, either, which was ease of use, automation, and a presence in Penn State courses.

Unlike guides, course reserves were familiar to almost all of our constituent groups. There was a common and strong need conveyed that reserves have to be easier to request for a course, to create in a course, and to use from within a course. Our WorldCampus team had developed code to pull a list of reserves from our Symphony reserves system. Instructional designers and instructors, frustrated with the complexity of creating reserve reading lists and incorporating them into the LMS, increasingly provided their own direct links or took a chance on copyright by scanning articles and embedding the PDFs in their courses. These issues created an additional line of focus for our team.

Decisions

With the timely release of its LTI, Springshare provided us with a solution for the integration of our guides, which included easy access, little work on the part of the instructor, and simple integrations for librarians. We were also able to make improvements to reserves based on these user stories by implementing Springshare E-Reserves and Document Management. The implementation of this LTI will be covered in the following chapter, and the integration of both guides and reserves will be addressed in chapters of their own.

Notes

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One Step at a Time

Large-Scale LTI Implementation at Penn State

Linda Klimczyk

Penn State utilized a locally customized version of ANGEL as its learning management system (LMS) for many years. In October 2016, the parent company of ANGEL, Blackboard, announced end-of-life for ANGEL. Penn State's contract would run through December 2017.[1] At the time that the end-of-life was announced, many changes were happening at Penn State. The new student system LionPath was being implemented. Penn State's World Campus and the ANGEL development team were experimenting with the new Learning Tools Interoperability (LTI) standard. LTI provides a standard method to connect LMSs with learning tools and third-party systems for both role and content exchange. Word of LTI was beginning to spread across the Penn State development community. And, of course, a major effort was launched to select the next LMS for Penn State. These factors, along with the library's move from static HTML guides to Springshare's LibGuides, created an environment of possibilities just waiting to be tapped.

Along with LibGuides came the availability of the LTI.[2] Personnel from Library IT and Library Learning Services were already serving on the university's Canvas Implementation Team and Technical Implementation Team, so they had access to people in the know about Canvas LTI integrations. After some reading of Springshare documentation, a request was made to load the LTI into Canvas so that the library could test it out.

That request turned out to be the tip of the iceberg. Many decisions, approvals, configurations, and so on had to be made before we would have an LTI to test. The Penn State Canvas team was updating policy, procedure, and risk management while units like the library were making requests to move forward with integrations. Fortunately, all of the key players were collegial and flexible as well as willing to make something happen at least on a test server while working through politics, security, and formal approval paths.

We eventually got the LTI installed on the Penn State instance of Canvas Beta. Then we realized what that meant. We had an enormous amount of research and testing to do before we would see anything in action. What followed was one crazy summer of stumbling in the dark and intense trial and error.

First, we learned that the lag time to get requests to and from the small and extremely busy Penn State Canvas tech team was lengthy. It immediately caused delays in our work. We decided, then, that a locally installed instance of Canvas to use for our own work would significantly speed up our process.

Fortunately, Canvas is available as an open-source product released under the AGPLv3 license.[3] We were free to download and install it. This wasn't exactly plug-and-play, but the growing Canvas integration community at Penn State provided input when needed, and we ended up with a successful local installation in the library.

We chose to install it on a Linux server rather than on a development laptop so that we'd have the opportunity to emulate a real LMS environment with a number of users serving in various roles. This was a good decision and aided our testing significantly. It was also helpful as we worked on debugging the LTI code later with the vendor. It was invaluable to us in developing the terminology skills and level of credibility that helped us to manage the political arm of the process to get the LTI approved. It gave us the knowledge to ask for Library Resources across all courses

and the language to intimately explain the workings to learning design specialists.

Setting up the LTI came next. We were able to have the Springshare Manual LTI tool loaded into Penn State's Canvas environment, and we replicated that feature in our local instance. The manual LTI tool provides a way for course designers to embed content from LibGuides directly into a particular location in their course. It then appears as course content rather than as an external resource. Through a tool that shows up as a small blue cloud in part of the Canvas tool set, the designer can search for and embed an entire guide, a page of a guide, a paragraph of a guide, a list of reserves, and so on into a course. The manual tool relies on the course designer finding the library guide by the guide's title and then selecting what portion of the guide to include. Librarians took to this quickly. As we learned through focus groups, surveys, and user story exercises, even the concept of guides was new to our course designers. Although this tool was powerful, it would be difficult to market and demonstrate its value to course designers.

We continued our investigation and began experimenting with the "Automagic LTI Tool," which can add a navigation element to every course and can match metadata elements between the LMS and Springshare so that the matching guide or reserve content is automatically displayed in the course. The easy work was setting up a name for the tool that would display in Canvas Navigation (e.g., Library Resources, which is what we chose).

Security and Privacy

To comply with Family Educational Rights and Privacy Act (FERPA) privacy policies, we needed to configure the LTI tool to work with anonymous users and to pass only the required data elements between Canvas and Springshare. Springshare tweaked the LTI tool to limit the information transferred between systems and to allow our required anonymous access. Anonymous access works because we match on course information not personal information. The person's access to courses is handled within Canvas and is completely independent of the LTI tool. The Canvas technical team and course designers were initially concerned that anonymous access would potentially compromise license agreements with our database vendors. We explained that while the links may appear in any course, they still have to resolve through standard Penn State authorization methods. Therefore, if a person isn't a Penn State student, faculty member, or staff member, they won't have access to view licensed reserves. On the other hand, guides as well as the Ask a Librarian chat service are fully public, so there were no concerns with those. The "virtual handshake" the LTI establishes between Canvas and LibGuides is handled through configuration settings in the tool that include a shared secret, security key, and specific URLs.

Metadata

Digging into Springshare's LibGuides Automagic LTI documentation, it appeared that we would use the Course Name field to tie guides to courses in Canvas using the stepped search feature of the Springshare LTI. Stepped search begins with an exact search on a predefined metadata field passed from Canvas (e.g., course name = ENGL 015). If a match is found, then the guide for ENGL 015 is associated with ENGL 015 course in Canvas. If no match is found, the tool shortens the string by one character and iterates through all characters in the string until either a match is found (e.g., ENGL 015 matches on ENGL) or no match is found. When no match is found, we have the option to associate a default guide.

Unfortunately, the Course Name field is editable in Penn State's implementation of Canvas, and many of our instructors choose to customize their course name. Because of this, it is impossible to use the name field for matching across the student system course names and Canvas course names. We needed to find a metadata match point that we could use to connect the Canvas course to the LibGuide. Once we determined that match point, we would add appropriate metadata to our guides, make the connection, and *ta da!*—guides in Canvas.

We quickly learned that there is no common data element between the student system, where the course listings, descriptions, schedule, and so on reside and are managed; the LMS, where the course content lives; and our LibGuides. However, the university Canvas team was also using imported data from the student system and had developed an algorithm to construct a course ID (SIS ID in Canvas) from three elements of the student system data: term, session, and class. The values were automatically set by them in Canvas, uneditable, and guaranteed to persist through a semester (with the exception of merged courses).

This constructed numeric field was useless to us as a match point in the stepped search since the numeric strings don't represent a topical hierarchy, and so on. But it was the only static common data element.

We realized that we needed to move on to the less intuitive, more labor-intensive and more accurate translation table method. The translation table was a three-column Excel sheet: `lti _ param _ value` (value coming from LMS), `meta _ value` (value in our guide metadata), and `subject _ name` (optional). We tried various methods and came up with the following process:

314572168ENGR 1 310 002AEntrepren Ldership UC WBUCWS WS 0172612016/08/222016/12/09	Entrepreneurial Leadership
314562168ANSC 1 107 001VIntro Eq Sc and Ind UC WBUCWS WS 0030972016/08/222016/12/09	Introduction to Equine Science and the Equine Industry
314532168EDTHP 1 434 001 Hnr Tch Exp Ldshpj ED P UPED_EPS UP 0155302016/08/222016/12/09	Honors Teaching Experience in Leadership Jumpstart

Figure 3.1
Raw data from the student system.

SIS ID	21681--31457	21681--31456	21681--31453
Class	31457	31456	31453
STRM	2168	2168	2168
Subject	ENGR	ANSC	EDTHP
Ses	310	107	434
Catalog no	Entrepren Ldership	Intro Eq Sc and Ind	Hnr Tch Exp Ldshpj
Sec.	002A	001V	1
Description	Entrepren Ldership	Intro Eq Sc and Ind	Hnr Tch Exp Ldshpj
Long course title	Entrepreneurial Leadership	Introduction to Equine Science and the Equine Industry	Honors Teaching Experience in Leadership Jumpstart
AcGrp	UC	UC	ED
IM	WB	WB	P
Acad org	UCWS	UCWS	UPED_EPS
Cmpus	WS	WS	UP
???	17261	3097	15530
Start date	8/22/2016	8/22/2016	8/22/2016
End date	12/9/2016	12/9/2016	12/9/2016

Figure 3.2
Parsed raw data.

SIS ID	**Class**	**STRM**	**Subject**
21681--31457	31457	2168	ENGR
21681--31456	31456	2168	ANSC
21681--31453	31453	2168	EDTHP

Figure 3.3
Subject field used as metadata value.

Obtain a download of raw data from the student system (see figure 3.1).

Create a script to parse the raw data into a tab-delimited format and create the SISID field in our course list using the algorithm supplied by the Canvas Tech Team (see figure 3.2).

Utilize the Subject field from the course list generated from our student system as the metadata value entered into LibGuides (see figure 3.3).

Utilize the SISID field from Canvas as the course match point. The subjects from the course list (figure 3.3 in bold) aligned fairly well with our broad guide areas. We used Excel to generate a unique list of subjects in the course list. Our LibGuides lead mapped these to guides (figure 3.4 in bold). During the preparation and soft launch, only the most frequently used guides were mapped. Eventually, we added metadata to all guides.

We populated the translation table with 32,000 value pairs: SISID and Subject as `lti_param_value` and `meta_value` by copying these two fields from our converted course list in Excel and pasting them into the empty Excel translation table template (figure 3.5).

We configured the settings in the Automagic LTI tool to specify the metadata field names in Canvas and LibGuides and uploaded the translation table. After a few rejected uploads and data cleanup on our end, it worked.

We configured the LTI Tool in Springshare to default to a generic guide in a no-match situation. This covered those subjects where we had not yet entered metadata in LibGuides as well as all occurrences of courses that were in Canvas but not in our translation table. Lesson learned: the course list is dynamic throughout a semester and changes between semesters. The default guide assured that the Library Resources tab always pointed to content.

We now had a menu item in Canvas named Library Resources that opened a guide for every course on our test server. It took several detailed conversations to help the Canvas technical team to understand that we needed them to redo their initial manual LTI tool installation and add the Automagic LTI tool. Politics and

ID	Metadata Name	Metadata Value	Object Type	Object ID	Object Name
13960	lti	ECE	Guide	387324	Education (General)
13920	lti	ANSC	Guide	379646	Animal Science
13995	lti	ECON	Guide	405060	Economics
13992	lti	ENGR	Guide	375711	Engineering (General)
13944	lti	EDTHP	Guide	400260	Education: Policy and Leadership
13904	lti	EDSGN	Guide	373544	Engineering (General)

Figure 3.4
Guide and metadata value mapping.

lti_param_value	meta_value	subject_name
Paramter value coming from the LMS or other LTI tool consumer (required, unique)	Metadata value assigned to your Guide or Course (required)	unused field
21681--31457	ENGR	
21681--31456	ANSC	
21681--31453	EDTHP	
Etc.…		

Figure 3.5
Populated translation table.

size of our organization resulted in additional delays. Eventually, we were able to conduct a successful test on the Penn State Canvas Beta site, which enabled us to move into production.

The LTI Automagic tool also includes the option to integrate other Springshare products into Canvas and provides rudimentary control of the Library Resources page created within each course. We took advantage of this and added LibAnswers, our chat and email reference tool, to provide support by library personnel directly in the course.

Course guides presented a new challenge. For these, we needed to link a specific guide to a specific course rather than to a general group of courses by subject (e.g., ENGL courses). Knowing that the SISID is unique (with the exception of merged courses), we experimented with including the SISID into LibGuides metadata corresponding to the new (SISID) `meta _ value` in the translation table.

> LibGuide metadata: Was ENGL --> Became 20651---7038

The translation table became figure 3.6.

This worked well. But it wasn't consistent. We discovered through trial and error as well as collaboration with Springshare that the order of items in the translation table mattered. We were adding rows for course guides at the end of the table most of the time, meaning that the SISID was in the table twice—once with the `meta _ value` (e.g., ENGL) early in the table and once with the SISID replacing the term in

lti_param_value	meta_value	subject_name
21681--31457	21681--31457	
21681--31456	21681--31456	
21681--31453	21681--31453	

Figure 3.6
Course guide entries in translation table.

`meta _ value`. As the table was processed by Springshare LibGuides technology, later entries in the table superseded earlier entries if duplicate `lti _ param _ values` were present. We adjusted our process to ensure that we always included course guide values at the end of the table.

At this point we had accomplished a guide match for every course and specific matches for unique course guides and were in a soft launch. Soft launch meant that we had the Library Resources tab enabled in production Canvas with the pilot courses running during fall 2016. We didn't publicize it and didn't offer training. We watched to see how it would be received, using that reception to guide our future outreach efforts, which will be covered in a later chapter in this report.

We quickly ran into problems with course guides for some of our large courses like our introductory English class (ENGL 015). These began defaulting to the generic ENGL guide in Canvas rather than to the course guide. We needed to collaborate with instructors and course designers to solve this problem because we had no access to specific PSU Canvas courses unless we were involved as an instructor or TA in the course. We discovered that instructors often merge sections of large courses so that they have to manage course content for only a single course rather than for many sections. This is the one instance where the (uneditable!) SISID unique identifier changes. Canvas creates a merge ID and assigns it to all merged sections, replacing the original SISIDs. When the SISID changes, the link to the course guide breaks (remember, it matches on `lti _ param _ values` = SISID and `meta _ value` = SISID). This complication continues to cause problems. We have no way of obtaining a list of merged courses from Canvas and cannot proactively alter our translation table to account for these changes. We've had to reach out to instructors

and designers to ask them for the merge IDs in order for us to update our translation table.

Canvas was new to everyone, and it took some learning and explaining on everyone's parts to find the right place in the course settings to find the SISID for both us and the instructors and designers. This turned out to be valuable front work because we needed to replicate this process to associate course reserves with single courses, sections, and merged courses.

Finally, we had everything connecting as desired. We realized four things. One, the translation table would need to change frequently. Two, accurately managing the translation table was key to ongoing success, and it required specific knowledge of how the systems work together and keen attention to detail—not rocket science, but not work that we wanted to delegate too widely, so only three people assumed this responsibility. Three, we had to develop a workflow so that we didn't overwrite each other's work and potentially lose data. Four, metadata entered into LibGuides had to be revised at least once a semester to reassociate course guides with new course SISIDs and merge IDs.

Moving from soft launch to launch required additional reflection on how to manage a constantly changing list of courses from our student system. We had a simple process for generating the initial translation table to load just before the start of each semester:

- Obtain course list from student system.
- Run script to generate SISID number column.
- Extract two columns: SISID and TERM.
- Paste these into an empty translation table template as `lti _ param _ value` and `meta _ value`.
- Add lines at the bottom of the table for any custom course guides and merged courses that we know of at the time.
- Upload the translation table into Springshare.

Knowing that the course list changes, we realized that we needed to identify and incorporate only the changes to the course list into the translation table. We developed a workflow to download a new course list weekly for the first month of the semester. We then developed a script to scan the list against the previous list and produce lists of deleted, modified, and added items. We ran the script to generate SISID numbers on these lists. We realized that to save labor we didn't have to modify the translation table to remove courses and sections that had been deleted since there would be no impact from this use case in Canvas or in LibGuides. We originally reviewed the modified list with the intent to update the translation table from it, but then realized that the elements used in the translation table (term, session, and class) were not the elements that we saw changing in the course list. We primarily saw modifications to descriptive elements. Now, we simply append the added rows to the end of our translation table.

Next, we needed to associate large groups of courses with similar attributes to a guide. Examples include Communication Arts and Sciences (CAS 100), all courses at a particular campus location, and so on. This challenge built on workflows that we had already invented. We took yet another pass through our converted course list to extract a list of courses with attributes that matched the group criteria. After that, additional scripts were created to add a term into the `meta _ value` field, and the same term was added to the unique guide for the group of courses. All of these custom associations could still be undone by merged courses. Additionally, if a course fell into more than one special situation, only the last match in the translation table would apply.

As we began to integrate Springshare E-Reserves and Document Management, this problem became more significant. The translation table was also used by E-Reserves to associate reserves with a particular course by metadata matching. Now we had to choose to associate either a guide or a reserve with a course. This was unacceptable and required a fix by Springshare. Fortunately, Springshare is an extremely responsive vendor and was watching our large-scale implementation carefully. The ultimate solution was for Springshare to add an additional field in the translation table. This is described in more detail in the reserves chapter.

Management of the data has become routine but no less complex over time. To recap, *just before the start of each semester, we*

- pull data from the student system
- run scripts to generate SISID
- extract the two columns of data needed to populate the translation table and replicate the third
- associate course guides to specific courses by SISID—in both spreadsheet and guide metadata
- upload the translation table during the first weeks of each semester
- run the difference script and repeat the steps above on the added courses
- associate guides to courses by SISID and merge ID as they are identified
- associate reserves to courses
- repeat

The remaining unwieldy process was editing metadata in LibGuides item by item. What we needed was a way to export our metadata, make changes, and upload—just like the process used with the translation table. Springshare has been able to provide batch editing tools that streamline processes and save staff time.

Conclusion

For many institutions, the stepped search option in Springshare's LTI provides both accuracy and flexibility matching guides to courses. However, for those who do not have standard, unchanging course titles, the translation table option, though a bit more complicated, is a solution that can provide library content in every LMS course even in the most complicated large institution setting. We hope that with our experience as a model, other libraries can take advantage of LTIs of this type.

Notes

1. Jennifer Struble, "Blackboard Announces End-of-Life for ANGEL; Penn State Support to Continue," Penn State News, October 16, 2014, http://news.psu.edu/story/330583/2014/10/16/blackboard-announces-end-life-angel-penn-state-support-continue.
2. "Learning Tools Interoperability Deep Linking," IMS Global Learning Consortium, accessed March 23, 2018, https://www.imsglobal.org/specs/lticiv1p0.
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Chapter 4

Bringing Guides to Every Course

Amanda Clossen

Based on Penn State's Canvas implementation strategy, guides became a primary area of focus for Canvas integration. Guides were of particular interest because they are artifacts that most librarians at Penn State create, often in collaboration with instructors, as course-specific resources. No other instructional resource had been created by the library with such depth of scope and breadth of reach.

Furthermore, it was a particularly timely integration, as guides had been transitioned from an institutionally hosted solution to Springshare's LibGuides earlier in the year. Not only did this transition allow use of the Springshare LTI, but it also followed several revisions to guide content that made implementation of the LTI run more smoothly.

During the transition to LibGuides, guides were created for every major offered at Penn State. This proved of vital importance for the automatic implementation within the LTI. Additionally, transitioned guides were revised to demonstrate a more user-friendly model. Workshops were held to instruct guide creators on writing-for-the-web techniques, as well as to inform them of simple formatting decisions that improved guide usability and readability. Penn State's revamped guides were sleeker, sharper, and addressed more programs than they had before the transition. And this was ideal because if every student in the university was to have a guide in their course, those guides needed to be as usable as possible.

As the more technical aspects of guide integration have been covered in the previous chapter, this chapter will focus on the practical questions of the implementation of the LTI we chose. Springshare's LTI integration allows for two different methods of guide integration, falling under the categories of either manual or automatic (known as automagic). Penn State implemented both methods.

Automatic Guide Association

The first thing required by the Springshare LTI was a static piece of metadata that could be used to establish a connection between a guide and a Canvas course section. As mentioned in the previous chapter, the only piece of static information existing for each course section was the field known as SISID, a course identifier established by Canvas. All other information, such as the course's title, could be altered by the instructor, thus unintentionally breaking the connection between the LTI and the course section. SISIDs are twelve-character strings, including both numbers and dashes, that describe a specific course. They have no identifying characteristics aside from the first number, which indicates the date the section was established. For example, 21811—XXXXX would represent a course starting on the first of January 2018.

With our decision to use the translation table described previously, it was necessary to gather the data required to create a functional translation table. Course information was drawn from LionPath, our student information gateway, and through a script, courses were matched with their course abbreviations. These abbreviations were then used as metadata. For instance, all courses with the abbreviation MATH were associated with the math subject guide. This metadata contained within the guide was static, so that every semester as a new translation table was generated, all MATH courses were associated with the math guide. Some guides, such as our general business guide, had

multiple course abbreviations listed as metadata, as the management and entrepreneurship courses used this as their primary guide as well. Assigning the metadata by course abbreviation was a very large task, but luckily it needed to happen only once.

An unforeseen issue with the translation table was that if two people downloaded it and decided to edit it at once, the data from one editing session would be lost when the second translation table was uploaded. Utilizing tools readily available, we came up with a simple tracking process. We agreed among ourselves to check in by email or in person before making changes. We downloaded the translation table from Springshare and saved it to a designated folder in Box. We utilized agreed-upon naming conventions to name the file by date and author. The initiator of the download would make changes, save in Box, upload back to Springshare, and then alert the others that the work had been completed. While this system was effective, we've realized over time that the much simpler solution of splitting the day in half between guide edits and reserves edits was just as effective.

Custom Guide Association

For some instructors, the automatically associated course guide was not sufficient for their course needs. In certain cases, the courses were offered at a campus other than University Park, with a different librarian contact, and a specific focus that required different databases of frequent use. To describe the other cases, we will look to ENGL 015, the required freshman composition course. While the English subject guide focuses on literary criticism, ENGL 015 focuses on rhetorical analysis and composition. There is very little overlap in content. ENGL 015 is an enormous course that a huge portion of the freshman population takes in their first semester. It is also a course with massive library involvement.

Without intervention in both of these situations, the course would simply continue to have the subject guide associated with it to little effective use. To rectify this situation, we created a systematic process for swapping out guide metadata.

Two pieces of information were needed in order to make the switch: the course SISID and the name of the new guide meant to be associated with the course. The SISID itself became the metadata that was placed in the guide's metadata section, under the label LTI, where we would normally have placed a course abbreviation. Within the translation table, the course abbreviation was replaced completely with the SISID for the course, either in the original entry or as an addition at the bottom. The translation table was then reuploaded, and the Library Resources page now featured the new guide.

When the LTI integration was initially piloted, the system for requesting new guides was not particularly systematic. Instructors would email their subject or campus librarians when they felt the guides associated with their course sections were inappropriate, and those emails were then forwarded to the librarian designated to resolve the issues. These initial emails rarely had the information necessary to adjust the metadata and required several conversations in order to locate the SISID. While having a standard identifying number for the course sections was excellent in terms of making good associations, this number proved difficult for course instructors to find. An additional issue was the number of instructors and designers reaching out to protest inappropriate guide association when no alternative for their course had yet been created. In some cases, they would become so frustrated that they would simply turn off the Library Resources tab completely, which was a situation we very much wanted to avoid.

To remedy this situation, a form was created to process the information necessary to associate a guide. Separate instructions were written for instructors or designers and for librarians. Both sets indicated where the SISID could be found. This cut down on instructor confusion almost completely. Instructors and designers were asked to already have a guide in place to replace the current guide, and if they did not, they were directed to their relevant librarian. Librarians were asked to input the SISID into the metadata for the guide to be integrated, which saved on processing time. This form both sent an email to the librarian responsible for changing the guide associations and also added the data from the request to an Excel spreadsheet so it could be easily accessed again. The permanent form was created using Drupal as that is the standard on the library's website; however, the initial form was a Google form, which functioned just as well.

During the pilot of the LTI in the fall of 2016, eighty course sections requested to have custom guides associated with them. This number increased to 110 in the spring of 2017, and 145 in the fall of 2017. In 2017, three large-impact courses, each with over a hundred sections, were given custom associations before the semester even began. For two of those courses, this was coordinated with the liaison for those courses so that the instructors would be aware of the guide in their Canvas course. Students brought into the library were directed to the location of the guides within their courses as a reminder that the materials demonstrated in the session were easily accessible after the class.

Unexpectedly, the number of requests for guide associations was spread across the demographics, with instructors and designers making nearly as many requests as librarians. Instructional designers

specifically were the most interested in how the LTI was implemented, often calling or emailing the librarian tasked with making guide associations. The process has seen little complication and difficulty in the current semester (fall of 2017), indicating both an effective system and comfort and confidence in the process on the side of those who need to make requests.

Manual Guide Association

Manual guide integration requires no librarian involvement whatsoever. It inserts a blue cloud icon in any WYSIWYG HTML editor within the Canvas course, allowing anyone with editing privileges in that course to embed any item supported by the Springshare LTI into the text box. This meant that guides, portions of guides, and course reserves could be placed at any location the course editor desired. While guides could be embedded anywhere that text can be written, ideal locations were observed to be within assignments and within course modules. These establish the most direct point-of-need intervention. Instructors were particularly interested in integrating boxes from our citation guides in the text of research assignments.

Assessment

In order to track usage of the guides, it was necessary to track each instance of the LTI—that is, each instance of metadata that was inserted into the corresponding field in the guide. Springshare tracks this data. However, it was difficult to access this information via Springshare's dashboard due to the sheer volume of data that Penn State created. Luckily, it was easy to simply request this data from Springshare directly.

With this data, it was easy to see one thing: while 2017 hits on the LTI (clicking on the Library Resources navigation item to open the page) were quite high at 359,784 hits, instances where a guide was selected were many fewer at 223,643 hits. Though smaller, this number represented a fifth of the entire increase in hits that our guides had that year. Clearly, the Canvas integration was making an impact in students' access to guides.

In order to scan for improvement, we are focusing on the courses that had the most engagement with the guides and LTI page. The goal is to interview these faculty and see what they are doing to get the class to engage with the embedded library content.

Manual guides also provided interesting statistics, namely that they were not being used to their full potential. Leveraging influence with instructional designers, our Online Learning Librarian began to market the resource more aggressively in 2018, and we hope to see an increased use of that tool in the coming year.

Things to Improve

An issue that we have seen arise as a result of our translation table system is that of merged courses. Merged courses are created when a designer or an instructor wants to take multiple sections of a course and put them together, allowing for easier course management. This process in many ways makes things easier for the instructor; however, it also has the unexpected side effect of creating courses with SISIDs that do not exist in the translation table created from LionPath data. Original SISIDs are replaced with a merged ID, which is not available for collection unless specifically requested. As a result, merged courses are always given the standard Starting Library Research guide, unless a request is made otherwise. This is a particular issue with large-enrollment courses. Conversations are taking place on a higher administrative level about creating course IDs that do not change from semester to semester and could be used to more permanently map guides, but we don't foresee this process as taking place very quickly when there are many other LMS improvements necessary.

In general, while associations that are made completely automatically would be wonderful, it seems unlikely to be possible in the current instructional landscape at Penn State. We don't anticipate stopping our regular maintenance of our translation table any time soon.

Another concern with this process is that of scale. Increasing numbers of librarians are creating course guides that they wish to custom associate with courses in Canvas. While everything is functioning effectively now, after a certain point, this number will become unmanageable to coordinate by hand. This has led to a level of strategy in our approach to how subject guides are created. Guide creators are encouraged to make guides that are effective for a large number of courses within the discipline, reducing the need for specific course guides. This does not eliminate them completely, and the conversation surrounding this issue is ongoing, but it is a step in the right direction.

Conclusion

Guides are one of the library's most iconic instructional tools. Our experience demonstrates that while closely integrating them within the LMS increases the likelihood that they will be seen, it's far from a guarantee. Collaboration with librarians, faculty, and instructional designers is still necessary to draw

in students to the resources that can help them with their assignments.

As in any other use of human resources, it's important that guide integration be approached with high-impact practices in mind. This goes beyond the simple scope of guide creation, and instead brings into sharp focus how users are interacting with the guide. We want the things we do to have a direct and meaningful impact on our students. As we move forward with guide integration in Canvas at Penn State, we plan to keep this goal in mind.

Chapter 5

Migrating Electronic Reserves to Springshare at PSU

J. Christopher Holobar*

Penn State University Libraries developed an in-house electronic course reserves system in the mid-1990s to supplement traditional print reserves. As at many institutions at this time, the system consisted of a series of authenticated webpages outside of the library catalog that listed readings organized by course number. In 2000–2001, the library migrated to the Sirsi Unicorn integrated library system (ILS). While the ILS did not then offer an electronic reserves component, librarians and staff determined that electronic reserves could be offered through WebCat, the public catalog interface, using the native course reserves module used for print materials.

At the time, the ability to make reserves available through the online catalog rather than separate webpages, the integration of electronic reserves with traditional print reserves, and the single course/instructor search interface were seen as real improvements over the existing system. Simultaneously, Penn State University was introducing its first centralized course management system, ANGEL. The University Libraries were invited to partner with the information technology groups overseeing the ANGEL implementation to bring library services, including electronic course reserves, library subject and course guides, and online reference into the ANGEL courseware as seamlessly as possible.[1]

In 2015, the university announced that it would migrate its courseware platform to Canvas, since ANGEL would no longer be supported by its parent company, Blackboard, after October 31, 2016. Again, the University Libraries were able to collaborate with the Canvas implementation teams to more seamlessly integrate library services within the course management system.

Selecting an Electronic Reserves System

In ANGEL, electronic reserves were linked to course pages through a custom-coded, automated course/instructor ID search in the online library catalog's course reserves module, taking students outside of the ANGEL interface and into the library online catalog. While functional, it was less than ideal from a user perspective, and, because SirsiDynix Symphony (as the system was renamed) had no dedicated electronic reserves module, concerns unique to electronic reserves, like tracking copyright, had to be resolved outside of the system.

Our awareness of the university's search for a new course management system provided both an opportunity and a strong justification for migrating electronic reserves from our ILS to a dedicated electronic reserves management system. As Penn State was investigating alternatives to ANGEL, a library group was charged with investigating different electronic reserves systems, including Dokutek ERES, Ares, and Springshare. Although Springshare's E-Reserves was a relatively new product with little published assessment, we did finally select it on the basis of its

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intuitive user interface, robust LTI and reporting capabilities, and because we could easily integrate the Springshare E-Reserves module into the Springshare services that we already licensed, including LibGuides and LibAnswers.[2] In a course management system like Canvas, all three of these services could be integrated with each course page under a tab we labeled Library Resources.

Springshare E-Reserves Implementation

The first hurdle that we encountered when planning to migrate our current electronic reserves holdings to Springhare's E-Reserves system was that we were migrating from our ILS and not from another dedicated electronic reserves system. So, for example, citation information and reserve-specific information existed in separate records in our ILS. This required assistance from our library technology group (I-Tech) to help us correctly map item information, such as authors and titles, and course information, such as course numbers and instructor names, to the correct fields in E-Reserves. One decision made in 2000, when we implemented electronic reserves in SIRSI Unicorn ILS, proved especially problematic. Because electronic reserves records were shadowed in the online catalog and not retrievable through keyword searches, and to speed processing, we had decided to have staff record citation information other than author and title in a single MARC 500 field instead of breaking out publication date, year, place, and so on into different MARC fields. While Springshare E-Reserves does have separate fields for this information, we determined that trying to populate these fields individually during migration would be too difficult.

A second hurdle was the result of our decision to try to limit the number of electronic reserves records to migrate. In fifteen years, we had created more than 25,000 reserves records, some dating back to 2000, and did not want to migrate potentially thousands of records that were no longer needed. We had used semester/year codes to track when and how often electronic reserves were used, but these were recorded by staff inconsistently in free-text fields, making a determination of a "date last used" difficult. Instead, we filtered on the date the original reserve record was created, which was hard coded, and chose to not migrate anything created before 2005, reasoning that anything created more than ten years earlier was unlikely to still be in use. We quickly discovered that we were wrong and spent a frenzied few weeks manually migrating reserves records dating back before 2005 that instructors still needed.

Those localized issues aside, the tools and support that Springshare provides for migration made the process relatively seamless, and I strongly suspect that migrating from one dedicated electronic reserves system to another would have been simpler.

Supporting Two Course Management Systems

We successfully piloted E-Reserves in the summer of 2016 with a small number of our World Campus online courses that had already migrated to Canvas. This was done with the intention of fully rolling out Springshare E-Reserves for all courses the following fall. As the university's migration from ANGEL to Canvas was phased, however, we were faced with the issue of supporting electronic reserves service in both course management systems. Further, the university was also migrating its student systems software to a product branded LionPath, impacting our traditional course numbering format in such a way as to break the custom-coded, automatic search from ANGEL to our online catalog. This meant that we could not continue to support electronic reserves in ANGEL using the system we had been using for more than a decade. And because ANGEL was due to be fully decommissioned the following year, it was determined that any effort spent to develop an LTI solution to integrate Springshare's E-Reserves into ANGEL would be misplaced, leaving us to solve the problem of supporting our electronic reserves service in two different course management systems in two different ways. In the end, we decided to move fully ahead with Springshare E-Reserves implementation, using the LTI tools to integrate with Canvas, and providing direct links to E-Reserves pages to the remaining ANGEL users.

Integrating Springshare E-Reserves with Canvas—LTI

A more complete description of the LTI integration may be found in another chapter of this work, but, briefly, linking Springshare E-Reserves and LibGuides to courses in a CMS like Canvas relies on metadata tags associated with E-Reserves lists and individual course or subject guides and a tool called a "translation table" that maps those tags to information associated with course sections from the CMS. For many course or subject guides, a tag may match part of a course number, like PHIL for philosophy courses.

Many, although not all, LibGuides apply generally to broader subjects, again, like PHIL for philosophy courses. The PHIL tag can be used for a philosophy LibGuide because, unlike a reserves reading list, the study guide can be used by all philosophy courses, and the PHIL tag can be used every semester

since the general course numbers will always begin with PHIL.

For electronic reserves, the situation is more complicated in that different instructors may have different reserves reading lists even if they teach the same course. The custom-coded link originally created to integrate electronic reserves lists into ANGEL performed an automated search for both course numbers and instructor IDs, effectively matching two different elements of metadata to identify a specific course section. While it's possible to add multiple metadata tags to both subject guides and electronic reserves, updating and maintaining those tags, and the LTI mapping, for the large number of course sections at an institution like Penn State proved daunting.[3] Further, when we implemented Springshare E-Reserves and LibGuides, we discovered that the translation table could match only one element of metadata from Springshare to one element of metadata from Canvas. For E-Reserves, the single piece of metadata unique to a specific course and instructor is the section number (SISID), which changes every semester even if the course number and the instructor remain the same.

For LibGuides, the translation table map is a straightforward spreadsheet listing more than 14,000 active course section numbers in Canvas in one column, with each section number's corresponding subject designation—again, like PHIL—in a second column. Each LibGuide was tagged in Springshare with the subject designation, completing the link to each Canvas course page. While course section numbers change each semester, requiring a new translation table, the subject tags in Springshare would generally not require updating.

For E-Reserves, the map is an equally straightforward spreadsheet listing active course section numbers in one column and then listing these active course section numbers again in a second column, with each E-Reserves list tagged with the specific course section number, matching the identical number from Canvas, completing the link to each Canvas course page. Unlike with LibGuides, changing section numbers would require both a new translation table and updated metadata tags in Springshare reserves lists each semester.

In our first semester, one conflict became immediately clear: we were using one set of metadata tags (course number prefixes) for LibGuides and a different set of tags (course section numbers) for E-Reserves; yet, the translation table could match only one tag for each course. In practice, this meant for each of the more than 700 course sections with reserves reading lists, the E-Reserves link overrode the LibGuide link and blocked guides from appearing. For courses with electronic reserves, the only immediate solution was to add course section number metadata to both the E-Reserves lists and the LibGuides, resulting in a significant workload issue and multiplying the chances for error.

A more permanent solution was a translation table that matched on at least two metadata elements, the subject designations for LibGuides and the course section numbers for E-Reserves. We suggested this enhancement to Springshare in fall 2016 and, fortunately, Springshare was able to implement it in time for the following semester.

Moving Forward

One critical advantage Springshare E-Reserves offers over our previous electronic reserves system is the ability to extract actual use statistics for reserves readings, something we lacked previously. And although we don't have pre-Springshare numbers to compare, our number of page views for E-Reserves doubled from more than 65,000 in fall 2016, our first semester with E-Reserves, to more than 130,000 in fall 2017. Overall feedback from both students and instructors is largely positive, and having a suite of library services under the same umbrella and incorporating the same tools, like LTI integration, simplifies management and offers a consistent interface for staff and users.

Springshare E-Reserves offers additional functionality that we continue to explore. A configurable online request form is available but not currently suitable for our needs. The University Libraries offer electronic reserves service at all twenty-five Penn State campuses, and our workflow is distributed, so that some E-Reserves processing is performed by campus staff. Our current request forms allow us to direct requests to the appropriate campus automatically, a feature not currently available in Springshare. More intriguing, too, are tools that would allow us to track the status of requests and, perhaps, more closely collaborate with other university partners, such as instructional designers working in different colleges, by giving them access to Springshare. And Springshare's copyright management features suggest possibilities for streamlining our current processes. Overall, however, we feel this implementation has been successful, and we look forward to other opportunities to bring library services and content to our students.

Notes

1. Britt Fagerheim, Kacy Lundstrom, Erin Davis, and Dory Cochran, "Extending Our Reach: Automatic Integration of Course and Subject Guides," *Reference and User Services Quarterly* 56, no. 3 (2017): 180–88, http://dx.doi.org/10.5860/rusq.56n3.180.
2. Fagerheim et al., "Extending Our Reach."
3. Fagerheim et al., "Extending Our Reach."

Chapter 6

Librarian Role and Embedded Librarianship

Victoria Raish*

Library integrations into Canvas have been critical for getting librarians added to the learning management system (LMS) for online courses. However, this does not have to be limited to online courses. It is relevant for any course that have students interact in a significant manner with the LMS. This chapter focuses on Penn State's embedded librarian program within the LMS, with a particular focus on the librarian role created within Canvas. There was significant intentionality built into the embedded librarian program to make the program, technology, and overall strategy work together. This program can scale to any size institution. In this chapter, we will discuss the best practices gained from coordinating embedded librarians in the online environment regardless of school size and online presence.

Best Practices

- **Start at the program level.** With all of the focus on scaling and maximizing reach across the entire institution, it is refreshing to see a deep connection to students, instructors, and the course content.[1] However, this means that there is no way you can meaningfully embed in as many courses as might request an embedded librarian. Starting the embedded librarianship conversation at the program level builds a relationship with the program head, allows you to focus on one or two courses that will have a high impact for both you and the students, and situates your embeddedness in the entirety of the curriculum sequence.
- **Value collaborations.** Embedding should not be a one-pony show. Even if you have a small number of librarians, you have partners in your instructors, course authors, technology staff, and others that are relevant to your institution. You should really think of an embedded librarian program as a partnership, not a solo endeavor. And on a practical level, before you commit to a program or course, make sure that you have a librarian available and interested in embedding in that area.
- **Start lightly, dig deeper.** When you start exploring all of the options for embedded librarianship, it is easy to become overwhelmed and attempt to do too much too soon. There is nothing wrong with starting the relationship lightly and building over time. As an example, a librarian at Penn State became embedded in a political science course. The first semester, she posted helpful links to a discussion board and offered to conduct individual research consultations for students. Three semesters later, she is now engaging with students in a required discussion activity and creating helpful videos for the students. This emerged through familiarizing herself with the course content, developing a shared understanding with the instructor, and pointing out needs and gaps in students' information research skills.
- **Respect your limits, respect your expertise.** You have limits in the amount of time you can devote to a course. This directly influences the types of embedded integrations that should be

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developed. You might not have time to develop a thorough assignment that you grade. That is okay! Choose quality integrations that work for you. The other boundary you should establish is in your expertise. The last thing to do is force a threatened conversation. Emphasize how you can be an asset to the course while respecting and valuing the expertise of the instructor or faculty member. A culture of respect is essential to develop an effective program.

- **Ask questions.** Whether you are an expert at using an LMS or a complete novice, ask questions. It is easy to think you're an expert and stop asking questions, but that leads to complacency. Think and proactively ask questions before communicating with students during the semester. For example, you might think that students should be communicated with through announcements, but the instructor utilizes email over announcements. To make the experience consistent for students, you should communicate in similar ways to the instructor of record.[2] This creates consistency of course design. If students have to manage communication from multiple forms and locations, it increases both their frustration and the chance that they will miss important information.

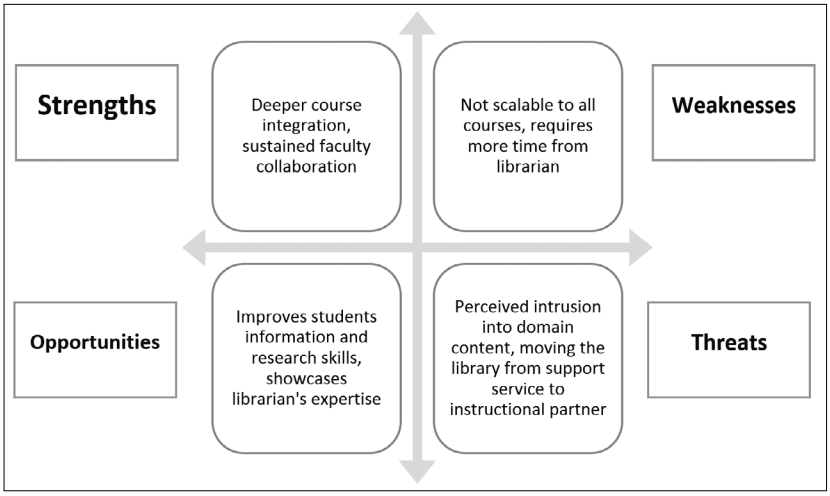

Figure 6.1
A SWOT analysis.

How to Get Started

When you decide to begin in earnest an embedded librarian role or program, there are good first steps to help you on the road to success. The first is to conduct a SWOT analysis.[3] This is an analysis that looks at the **S**trengths, **W**eaknesses, **O**pportunities, and **T**hreats of starting an embedded librarian program. Consider your local context when conducting this analysis. Figure 6.1 provides an example of a SWOT analysis. You can go much deeper than this, but it provides a foundation to conduct your own SWOT analysis.

The second thing is to immediately start thinking about metrics. One of the common requests when starting an embedded librarian program is showing the impact of the program, especially when the traditional mode of instruction has been one-shots. You will see a reduction in the number of courses reached, but the engagement will be deeper. Plan assessments and summary reports that will be provided. Consider giving some form of assessment and report to your partners. With a high-touch model of engagement, you must justify the value of the time investment.

When creating an embedded librarian program, you need to arrive at a solid definition of what it means to be an embedded librarian. There seems to be a misconception that you can be embedded in thirty-five courses. That was not how embeddedness was approached at Penn State. Our course integration started at the program level and was carefully cultivated in order to choose classes in which the librarian will have a high impact. What does high impact mean? For this program, it means a course where external research is expected and where students are expected to wrestle with more advanced information literacy concepts.

Weaving together numbers and stories helps to present a cohesive narrative of the impact you are having. It is much simpler to get a number of students reached and talk about impact in that way, but numbers woven with stories of student success create a more meaningful and memorable metric. The ideal report is where stories can be generated from numbers.

Assessing the Program

The final piece of the program after scoping and focusing is assessing. If you coordinate an embedded librarian program among multiple programs and courses, consider assessing overall programmatic outcomes. However, if you are a librarian embedded in a few courses, then the assessment should occur at the course level.

The main difference between these two levels of assessment is that the higher level of assessment does not focus on specific course objectives, but rather looks at impact of multiple courses in consideration

of the entire program. At Penn State, this is accomplished through a summary of course guide use, a student survey, and an instructor survey. In addition, midsemester communication occurs with everyone involved in the program to gain formative feedback. All of this is used to make iterations on the embedded librarian program. At the course level, individual learning outcomes should be assessed. Consider sending a report to your individual faculty letting them know the expected outcomes of your embeddedness in the course. Some aspects to consider at the program level have to do with awareness of the program and how the students interacted with their librarian. At the course level, assessment should involve your targeted learning outcomes.

Librarian Role

Students, especially distance students, typically have no conception of the physical structures within the university. Students who are on campus have buildings associated with services and the ability to ask their roommates and friends for information about different services. Distance students have websites, online communication, and phone calls to help them learn how the university works. This is insufficient for truly making their university experience the best it can be.

Despite needing to go to places like the billing and finance or course registration page, the vast majority of distance student interactions with their university occur through the LMS. This is how students complete their coursework, interact with peers, and build relationships with their instructors. As evidenced by the increase of use of our LibGuides, placing the library directly in Canvas has increased students' use of library resources and created a place for distance students to direct their attention.

However, while the embedded librarian program was already in Canvas at this point, there was no clear way to contact the librarian. Librarians could be labeled as student, instructor, teaching assistant, designer, or course administrator, but none of those terms adequately describe what the librarian has been designed to do in the course. Without a role of librarian that can be visible in the course list, it is on the students to identify that person as their librarian and make the connection. We discovered that several other universities had a librarian role in Canvas, including the University of Michigan. The team was able to get a list of privileges that the librarian had at Michigan in order to start the conversation at our institution.

As you are probably considering now, we had to think about how this would work at our institution. Due to the complexity and focus on risk compliance, we were unable to immediately create the role with the help of the IT department and distribute it university-wide. Instead, the role was eventually created through a year-long collaboration with the registrar and the learning management system team.

Initially, the role was based on student privileges because there were concerns with FERPA and librarian access to student grades. On an individual course basis, it was up to the individual instructor to add the librarian as an instructor and give access to student grades. However, on the university level, this was a decision with significant implications. This was primarily due to scale. Shifting this role creation to the university meant that approval of such a role would give blanket access to a set of privileges assigned to anyone designated with that role. If you encounter this situation at your institution, think through the legitimate educational reasons why librarians need their own role and be prepared to justify your argument.

The initial role was similar to the student role. Librarians could post to discussion boards and observe the class, but had limited power otherwise. This created limitations, especially in classes where additional content could not be seen until students completed the first content. It was completely unreasonable to expect librarians to actually complete the coursework. The revised role was based on the teaching assistant role and has nearly all related privileges. The only privilege not present that some librarians will use is the ability to grade assignments. There are some librarians who are grading assignments, but there is a clear differentiation in that if you are grading assignments, you are no longer the embedded librarian but are coteaching the course.

Structure, Support, and Governance

We all juggle multiple job responsibilities and services within the library. Therefore, for a program to gain legs and become a long-term part of the strategic plan, it is important to develop a structure and governance around any new program. This was necessary for the embedded librarian program and the librarian role. There are three overarching steps toward achieving this balance.

The first is to gain administrative support of the program. If possible, send out initial emails with the support of your administration to librarians who you think would be a good fit for the program. Once you gauge interest, you can begin matching areas of expertise to programs and reach out to those programs. Everyone is juggling several different responsibilities, so they are more likely to participate in the program when it is considered part of the strategic plan of the library.

The second level of support should come through professional development opportunities. Just because

everyone has subject matter expertise does not mean that they also know best practices for online pedagogy or have previously interacted with your student population. In addition, there are multiple definitions for what constitutes embeddedness. At Penn State, a professional development course was created for librarians to take prior to becoming embedded. This course is self-run without a facilitator. Librarians can take it at any time and, unless they have prior degrees or a certificate in a similar field, are required to complete it.

Finally, the third level of support comes through a community of practice that formed. In the fall of 2017, there were fifteen embedded librarians. They were in a range of courses in disparate disciplines, and for many of them, it was their first foray into online teaching. It became clear that a community was needed in order to cultivate a sustainable program that people were excited to work in. This team meets monthly and spends half of the meeting talking about experiences and unexpected challenges in the courses in which they are embedded. The other half of the meeting transitions to a focus on governance. If programs do not become a part of a governance or policy plan, it is more likely that they will not persist beyond a pilot period. Therefore, steps have been taken to create standard language around annual review reports, an understanding of the intensiveness of the work, and a workload policy so people are aware of the time expected in this program. These decisions have been made strategically in order to increase the stability, support, and structure of the embedded librarian program, supported by the librarian role in Canvas.

Conclusion

The embedded librarian program is but one piece of the puzzle that has come together through our LMS integration. The other decisions and actions, such as placing guides and reserves directly in the LMS, have created more holistic opportunities for the embedded librarians to engage with students. Regardless of how large or small your institution is, embedding librarians is a program that needs strategic thinking with a focus towards sustainability, stability, intentionality, and value added to the institution. A favorite professor used to say, "If you are going to make people come to a classroom, it better be because they can't do the work otherwise." For this program, I like to twist that to say: if you are going to add librarians to a course, it is going to be because they bring a level of expertise and support that cannot be accomplished through tutorials and written modules.

There are four pieces of advice to leave you with. Even if you do not remember everything from this report, take away these for a librarian role in your LMS: Determine the levels of access that your librarians need in the LMS and start that conversation early. Complete a curriculum map and identify areas with the most potential for a best fit. Reach out to your fellow librarians and gauge interest level. Complete program-level assessments with a focus on constant iteration and improvement. If you do these things, you will be well on your way to creating a high-quality embedded librarian program that improves experiences for instructors and students.

Notes

1. Elizabeth Tilley, *Personalizing Library Services in Higher Education* (New York: Routledge, 2016).
2. Selma Vonderwell and Sajit Zachariah, "Factors That Influence Participation in Online Learning," *Journal of Research on Technology in Education* 38, no. 2 (2005): 213–30, https://doi.org/10.1080/15391523.2005.10782457.
3. Robert G. Dyson, "Strategic Development and SWOT Analysis at the University of Warwick," *European Journal of Operational Research* 152, no. 3 (2004): 631–40, https://doi.org/10.1016/S0377-2217(03)00062-6.

Chapter 7

Ongoing Implementation

Outreach to Stakeholders

Amanda Clossen

Based on data collection shared with Penn State from Springshare in 2017, the first entire year using the LTI integration, an increase of over 200,000 hits on guides can be directly linked to use of the Canvas LTI. This was nearly a quarter of our total guide traffic increase for the year, and by all accounts a large number. However, it is also a number we are committed to increase through outreach efforts.

Although LTI integration makes it a lot easier for librarians to put content where instructors and students can reach, it in no way guarantees that anyone will use said content. In much the same way that students can come to the library itself and have no real understanding of what resources the library offers them, the Library Resources tab can be passed over within the course navigation if students are not instructed to use it. What's more, the link can easily be hidden by the instructors before a course even starts if they don't see a need for its inclusion. Its use is not necessarily intuitive, not because of the inaccessibility of guide content, but because of a lack of context for its use.

Based on student and instructor behavior, this seems likely to be true no matter where the Library Resources tab might be located. Though students in our initial survey described a sharp interest in guides, they also had no idea what their purpose was if they hadn't been told before the time of the survey. Instructors are incredibly busy people, with papers to grade, lessons to plan, and oftentimes their own research that calls for their attention. Their knowledge of library resources fluctuates from those who are extremely aware to those who rarely look at the library's website at all. While some explore the depths of Canvas, others use the most basic tools necessary for their course and leave it at that. Some don't use Canvas at all. In the spring of 2017, out of 27,000 SISIDs, only around 14,000 were active in Canvas.

To add another variable to this equation, at Penn State instructional designers are often responsible for taking the content provided by instructors and course designers and organizing this content within Canvas for easy use by both resident and online students. These experts in Canvas design are the most likely candidates to include manual library integrations, as well as to make the Library Resources tab a prominent feature in the course. Much like instructors, they have a variety of library backgrounds. Some are enormous library advocates, while others are familiar with very little beyond library reserves.

For some courses, the presence of library reserves, a required feature for students to access, showcases the existence of the library guide for the course as well as the Ask a Librarian widget. However, with only seven hundred courses with reserves, this number is small in comparison to fourteen hundred activated Canvas sections.

This chapter will review actions and strategies to target students, instructors, and instructional designers in order to increase awareness of the automatically integrated guides, as well as the blue cloud manual integration.

Students

Since students do not create assignments nor produce lectures and are often put in positions of being simple consumers of course content, reaching them through wide marketing efforts is difficult and not altogether necessary. Students seem to best learn about library tools in the context of a need for them in a course, and

that is how we decided our marketing efforts should be focused. In general, this meant not focusing on the student at all, but instead reaching out to those who control what the student is presented within the LMS.

However, at Penn State, the Library Resources link exists in all courses where it has not been removed, whether or not it is explained or used by the instructor. The way students engage with their courses differs wildly, but there are always some who will click on the Library Resources link to see what it is. For these students, it is important to make the content in the guides clear and easy to understand even if out of context.

The most important step, which is also reflected in the literature on guide usability, is that students are given a succinct but clear explanation of what the guide is for.[1] Otherwise, our student survey indicated they were confused as to the purpose of guides and had no real reason to use them. Taking this into consideration, guide authors and librarians were encouraged to provide some sort of introduction to their content. Not only would these descriptions help students, but they are also useful for instructors and instructional designers who might then realize that the guide content was something that could improve their courses.

Obviously, guides designed with usability in mind are more accessible to students, making it more likely that students will use them. Some usability practices focused on by our LibGuides team included writing more concisely for the web, reducing the length of lists of links, better link descriptions, and putting the most important material in the first box on the first page of the guide.

Instructors

At Penn State, courses are taught by a variety of instructors, from graduate students, to lecturers, to tenured faculty. Each of these groups is extremely busy in their own right, so the interest in reaching out to librarians or including library resources in course content varies greatly. Instead of applying a blanket system of outreach, a more tailored approach was taken, focusing on areas of greater impact.

The most important partner in advertising our Canvas integrations were the subject and campus librarians themselves. Penn State as an institution is divided among twenty-four campuses, including the largest at University Park. While the subject librarians are stationed at University Park, the campus librarians are the direct line to the library at the campuses they work. These two groups of librarians have already done the legwork in building bridges between librarian and faculty and often are most aware of the needs of instructors they support. If these librarians are equipped with an understanding of the functionality of the LTI, the resources available for integration, and the ways these resources can be integrated in courses, they can then share this information with their faculty.

Subject and campus librarians are almost always the creators of course guides, and they often spearhead the process of guide association. Not only does this allow us to assign the most appropriate guide to courses, but it also provides an additional line of communication between instructor and librarian. Every semester, custom guide associations must be remade, which allows for another regular opportunity for conversation and collaboration to take place.

In addition to this grassroots form of outreach, other more formal outreach steps were taken. Our Learning Design Librarian served as a Canvas blogger. The *Canvas Blog* was created by the Teaching and Learning with Technology unit at Penn State and featured entries from instructional designers, faculty, and others who were going through the course design and transfer process. Involvement in this blog required one post a month. Library posts included a post on the Library Resources page, how to request reserve readings using the new system, automatic integration of library resources, the Ask a Librarian widget, the manual blue cloud integration, and the Embedded Librarian program. Blog posts included visuals and statistics as well as two videos demonstrating the different types of integration.

Penn State as an institution took many steps to make certain that Canvas users were comfortable through the transition. This led to many opportunities to demonstrate the libraries' functionality in Canvas, both in presentation-style and demonstration-style scenarios. Presentations were made at yearly Canvas Day events, where faculty and designers were encouraged to explore the possibilities Canvas has to offer for their courses. The Embedded Librarianship program was showcased along with automatic and manual Canvas integrations, providing faculty and designers with the full spread of what library resources were available for their courses. Presentations were also made at our yearly technology symposium, a very large event that draws attendees from across Penn State's twenty-four campuses, as well as the yearly Learning Design Summer camp.

Attendance at such presentations were varied and unpredictable, from large crowded classrooms to a group of three. But the impact was not limited simply to those who viewed the presentation. The libraries' mere attendance at such events, with their visibility on program schedules, alerted Canvas users to the libraries' presence in Canvas and gave contact names for future reference. The philosophy of the libraries' LMS team was that at an institution of our size, there's no such thing as too much exposure, so we sought to be present at every event possible.

Instructional Designers

Much of the outreach to instructional designers took place in the same ways listed for instructors. Many institutional outreach efforts, like the *Canvas Blog* and Canvas Day, were directed at both instructors and designers. However, there was a specific need with regard to instructional designers, who were in some cases less aware of the libraries' resources.

We, a group of librarians, would not be aware of this issue had there not been an instructional designer on the libraries' LMS team. This team member pointed out the lack of understanding she had encountered when looking at the libraries and what was available when she was working on courses herself. In order to rectify her gap in knowledge, she set up a private consultation with a librarian and left the session with much more knowledge than she had possessed previously. She felt more confident engaging with the libraries and more willing to include materials she hadn't previously considered.

Because of this, we began a slightly different approach with instructional designers than we would have considered previously. This approach went beyond simply sharing what library resources were available and extended to demonstrations showing how library resources could be used within the context of a course, as well as the situations that students found themselves in that required library resources.

The first instance took place during a monthly meeting of instructional designers held synchronously online and in person, consisting of around seventy-five attendees, with more to review the recorded presentation at a later time. The LMS team was requested to share their Canvas integrations with the group. It was decided that in order to provide context that a brief demonstration of the ways a student could use the libraries' resources to do research was in order.

The session began with a brief hypothetical research situation that a student might encounter, and then the group was queried for potential solutions. While Google and LionSearch (Penn State's Summon product), "library guides," and "library databases" were mentioned by attendees, there was no specific strategy suggested as to how to approach the actual process of doing research. With this context, the instructional designers were then briefly taken through the library's resources, starting with locating a subject or course guide, then choosing the proper database, followed by creating an effective keyword search, and ending with sending citations to themselves.

The entire process took approximately fifteen minutes, and while it was not interactive, the number of questions that followed the demonstration was large. Through the process of answering questions, we were able to explain the LTI and its implementation, as well as gather feedback for how instructional designers felt the LTI and its tools could be used. The librarian presenting handed out her cards at the end of the session, and when requests for custom guide integration were made, they were often from individuals who had some sort of connection with that session. As word of mouth is extremely important within the instructional design community, making connections with individual designers can prove extremely fruitful.

The library's LTI integration is now a part of information literacy workshops regularly provided for instructional designers. These workshops encourage instructional designers to consider the information needs of the students and provides handouts and references that instructional designers can refer to in the future as they work to embed the library in their courses.

Conclusion

In order for LMS library integrations to be used, they must be understood. Although automatic integration allows specialized library resources to be targeted at all LMS courses, that does not mean that they'll be accessed. It is important then to build ongoing relationships with stakeholders, providing not just information that such integrations exist, but also reasons why to use them.

While Penn State's implementation of the LTI is centered on a small group of librarians and staff, the LTI's effectiveness in many ways hinges on the subject and campus librarians and their ability to instruct their faculty in the use of this tool. As is nearly always the case, collaboration in this instance is key.

Note

1. Denise FitzGerald Quintel, "LibGuides and Usability: What Our Users Want," *Computers in Libraries* 36, no. 1 (February 2016): 4–8.

Conclusion

Amanda Clossen

Not every institution uses Canvas, or even Springshare products. The LMS transition at Penn State is only a single example out of many. The issues we faced in implementing our own integration are more complicated than those some other institutions may face, while being much simpler than others.

Comparisons often fall short when approaching institutional decisions regarding course identifiers, risk management procedures, FERPA interpretations, and LMS role assignment. But these are all issues that will likely require consideration in the process of integrating library resources of choice into an institution's LMS. There is no way to create a comprehensive checklist of situations to prepare for; however, we will leave you with ten lessons that we learned in our large-scale implementation:

1. Explore the projected impact of your integration before you begin. Some integrations are very time- and labor-intensive, and the effort may be better directed elsewhere.
2. Work to place a library representative on the institutional LMS committee if one exists. Being part of the decision-making concerning the LMS leads to much smoother sailing when the time comes to request LTI creation or implementation.
3. Create a diverse LMS implementation team. In addition to librarians and IT representatives, try to include the biggest users of the LMS: instructional designers, faculty, and students. Even if they can't be full team members, involve them as stakeholders and seek out their perspectives whenever possible.
4. Create a local test instance of the LMS if possible, as integration in an institutional beta testing environment can take time. Canvas, Sakai, and Moodle are all open source and can be launched without further cost.
5. Become familiar with your institution's risk management practices. Risk management approval can take a very long time and the process can be confusing—it is important to start it long before you plan to launch your product.
6. Discuss FERPA concerns with the registrar's office as soon as you begin to consider a librarian role within the course itself. Administrators may not always be familiar with librarians in courses, and the discussion on student data confidentiality may take time to negotiate.
7. If your integration involves guides, establish rules for consistency in design and content so that students know what to expect when they see a guide.
8. Emphasize outreach within the library itself. In many cases, librarians do not use the LMS themselves and require as much education on LMS integrations as a faculty member. Many integrations require effort on their part, so it is important to get their buy-in as soon as possible.
9. Communicate with your vendor. Providing data on the functionality of your LTI instance often means the vendor can address challenges that arise that much more easily. It also leaves the vendor more receptive to your concerns.
10. Prepare to talk about your integrations very often, repeating yourself many, many times to the same audience.

We consider LTI integration at Penn State to be an iterative process. Implementation is ongoing. With each semester's new translation table, we develop new methods to make the process more efficient and precise. As the LMS grows and changes in functionality, we will strive to meet students where they are by listening to the voices of our stakeholders. Through this process we, the authors of this report, are eager to see the innovations of other libraries as we all work together to find a place for the library within the learning management system.

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