COMMUNICATION

Local Hosting of Faculty-Created Open Education Resources

Launching Pressbooks

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ABSTRACT

Rising costs of secondary education institutions, coupled with the inflated cost of textbooks, have forced students to make decisions on whether they can afford the primary materials for their classes. Publishers working to supply digital access codes, which limit the ability of students to copy, print, or share the materials, or resell the textbook after the course is over, have further pushed students into forgoing purchasing materials. In recent years, institutions have moved to support OER (Open Education Resources) initiatives to provide students a cost-free primary text or supplement to their materials. This allows students unfettered access to quality resources that help drive engagement in courses, from homework to discussions. While larger institutions or in-state partnerships with resource sharing consortiums, such as the MnPALS cooperation with the state of Minnesota, provide access to platforms like Pressbooks, smaller institutions and private colleges don't always have the ability to negotiate these types of relationships. In this case study, I will cover the foundations necessary to start a low-cost, self-hosted solution to support faculty creation of OER material and the available resources that the University of Dubuque utilized in their development process. This overview will briefly cover the skills and knowledge needed to support the growth of this initiative with minimal complexity and as little jargon as possible.

INTRODUCTION

At the University of Dubuque, the library installed, configured, and deployed an instance of Pressbooks to support faculty development of Open Education Resources (OER). The University of Dubuque is a small, private university with a total full-time enrollment (FTE) of about 2,000. Two library personnel lead the deployment of the resource. As many universities find themselves grappling with an increase in textbook costs and other barriers to students' access to quality information, libraries have emerged as a natural partner within institutions to identify, curate, and provide access to quality OER. Okamoto points towards a variety of ways that libraries have managed this, including the Community College Consortium for Open Education Resources (CCCOER), which includes "150 member colleges … promot[ing] OER adoption to enhance teaching and learning."[1] Braddlee and VanScoy state that librarians hold an important role in "supporting faculty and students in expanding the range of OER" through a number of methods, referencing prior research that Okamoto performed.[2] From a number of interviews from similarly sized liberal arts colleges, Schleicher et al. state that librarians leading the initiatives for OER "may need technical skills … to assist faculty in developing OER projects."[3] The benefits for students in terms of cost alone show that OER supported projects, such as the launch of Pressbooks at the University of Dubuque, has longstanding benefits for faculty, students, and the library.[4]

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Pressbooks is an open-source book content management system, making the software free for anyone to utilize, customize, and remix. With an open-source software as the basis for this project, the University of Dubuque could view and change any of the underlying codebase to fit their exact needs to provide a platform for faculty to publish and develop OER content for their classes and students. The overlaying interface and configuration of Pressbooks is built upon a fresh installation of the WordPress blog hosting system utilizing the multisite feature. These two systems are free to install, configure, and deploy on a locally hosted or cloud-based network. Larger consortiums, which can consist of state level organizations, universities, and partnerships with businesses, may have the flexibility in spending to fund a hosted solution from the company itself. The cost of paying for a hosted solution can vary depending on the needs of the community served. A Pressbooks EDU single network plan, hosted by Pressbooks, can cost $7,000 a year for the Silver plan or $14,000 a year for the Gold plan.[5] At the University of Dubuque, we opted for the low-cost solution of locally hosting our installation, which involved configuring the software locally and providing our own support for the faculty and students utilizing it. In this case study, I will detail how we successfully deployed the instance of Pressbooks for the University of Dubuque. This case study will cover the documentation used, the systems and services utilized to support the network, and the timeline from beginning the project to its successful launch.

DOCUMENTATION

To start the installation process, there needs to be a web server to host the Pressbooks instance. At the University of Dubuque, we used an already configured Amazon Web Services (AWS) account to set up the server that Pressbooks would run on. AWS offers a variety of tiers for its web server hosting, from the smallest available configuration that can be used for free to larger, more powerful instances for public access. At the University of Dubuque, we opted for the AWS t3a.large instance type, which gave us access to a faster server load for processing the installation and running the instance operations, as well as better network bandwidth.[6] Once we had the instance type selected, AWS allowed for configuration of a variety of operating system (OS) installations that come preconfigured or an à la carte option. We chose the same OS platform that we utilize for our digital repository, a C-Panel, CentOS 7 instance, as we already owned an educational software license for it. C-Panel offers a reduced cost, education license available for any institutions with a .edu domain. The application to receive an educational license for the C-Panel account takes little time to fill out and the only cost associated with the initial application is a $30 processing fee.[7] Once C-Panel activated the education license on our primary platform, the license was utilized on the other instances without having to worry about multisite or platform license fees.

AWS launches the instance in the EC2 Services page listed under the account, which details the instance's setup, volumes attached to the instance that the software gets installed on (with additional volumes available to add onto the instance if necessary), and the ability to create snapshots of the instance for backups and restoration of the installation configuration. AWS categorizes volumes as the primary storage devices for the installation, akin to a virtual hard drive, while the snapshots function as a copy of that storage device.

During the configuration process, AWS provides additional information about all of the options available in their EC2 service. As these are not directly relevant here, I will not go into detail about them. At the University of Dubuque, we had preconfigured Security Groups and Snapshot schedules set up that we applied to the Pressbooks instance before we installed the underlying software.

The primary documentation used for the platform setup before installing the platform came from the Pressbooks documentation site.[8] The documentation begins by directing users to WordPress and their famous 5-minute install. WordPress documents are available on their website (https://wordpress.com/support/); installation directions include prompts that guide users through the entire setup and configuration process. Once the WordPress installation process is complete, Pressbooks can be set up on top of the WordPress site by following the installation directions from the Pressbooks documentation. The beginning portion of configuring the WordPress site for Pressbooks involves editing the configuration file for WordPress to allow for multisite setups on the single instance of WordPress. Once the Pressbooks site is installed, Pressbooks will require additional plugins through WordPress in order for Pressbooks to function correctly. Again, the installation documentation for Pressbooks walks through each of the necessary plugins, providing directions on how to configure the files for the installation to work correctly, how to start the configuration of users and appearance, and how to begin the creation of digital materials on the site. Access to Pressbooks can be set up through the installation itself, using plugins to link the installation to Microsoft Office accounts, Google accounts, or any others that might be used. Once this final step is completed (which will vary institution by institution depending on what service the institution utilizes for their primary authentication method), the Pressbooks site is ready to be utilized.

There are two kinds of regular maintenance needed to keep the installation up to date. The first relates to the Pressbooks and WordPress installations and updates, changes to configurations, additions, or deletions for the instance. Most of these software updates, configuration changes, and plugin updates are handled through the Pressbooks interface under the Network Manager administrator menu. Since Pressbooks is a layered software that's built on the WordPress platform, all of the network configuration options use the same WordPress tools and user interface. The second kind of maintenance is done through a terminal command-line interface (CLI) connection to the AWS instance. This includes server maintenance tasks, which can be preconfigured through a script run on the server or handled by an administrator with sufficient knowledge of the system. The CLI can also locate the error logs to pinpoint any errors that may have happened during setup and configuration. This maintenance can run on a monthly schedule, usually to ensure that web hosting software or internet access services are running correctly on the AWS instance in addition to any server updates for the OS and installed platform.

At a smaller institution, the work on Pressbooks can be handled by a librarian or professional staff member, as WordPress makes the procedure as simple as possible for anyone. The command-line interface work, if an OS is installed without a user interface, can be handled by either a librarian familiar with terminal commands or a member of the institution's help desk or information technology support personnel. Any additional dependencies outside of what comes with WordPress are easily handled through the same Network Manager administrator menu. Most installs include a number of default configuration options, such as uploading documents, printing from a PDF, or view functionalities. At the University of Dubuque, any additional dependencies were all installed using WordPress and configured on Pressbooks without any need to access the server directly. For a smaller institution, this makes the process of approaching a self-hosted solution sustainable over time, as it does not require specialized knowledge of servers to handle Pressbooks once it is installed.

WORKING WITH FACULTY TO ADD MATERIALS AND ADDRESS CONCERNS

When we launched Pressbooks at the University of Dubuque (http://pressbooks.dbq.edu) and wanted to showcase how using the platform would be advantageous, we worked with a geology professor who had already created his own textbook for his entry level geology course. The PDF he created was over 170 pages long and included all of the terminology, concepts, and example questions the students would see on the quizzes.[9] We worked with the professor to get the original Word document of his textbook, complete with his own layout structure, font, and headings, correctly formatted to import into Pressbooks. The system manages the import process by utilizing very basic formatting of the document, identifying chapters based on the heading types.[10] Essentially, the library staff worked with the professor to sanitize the document of all unnecessary formatting, laid out the primary chapter headings in the document using the Word heading formats that are supported, and then processed the document through the Pressbooks tools for importing.

With the primary example uploaded and ready to showcase to the faculty members, our library director began fielding the requests of other faculty members at the University of Dubuque.[11] The current process for working with faculty involves sending any interested faculty the list of required reading that Pressbooks has hosted on their website. This includes materials related to creating the content directly in Pressbooks, importing the content from a Word document if authors already have something they want to use, and setting up an account as an author on Pressbooks. In addition to the geology professor mentioned above, two additional faculty members in vastly different departments, Computer Information Science and Philosophy, used our Pressbooks instance to curate their materials for their students. As the instance is built on a WordPress multisite installation, library staff are able to install and configure a variety of additional material for faculty—enabling practice quizzes, the list of glossary terms to study, and other material—either through the native Pressbooks interface or with the assistance of open-source plugins such as H5P, a plugin that allows community-created videos, presentations, quizzes, and interactive content to be created, shared, and reused. All of these additional configuration options, including adding the additional tools for faculty, are handled through the Network Manager administrator menu. Faculty with questions or needs for assistance can reach out to library personnel directly through email or by setting up a Teams or Zoom call to walk through the problem they might have or express a need that they can assist with.

LOOKING BACK/REFLECTIONS

Throughout the process, the University of Dubuque's work came to fruition through the efforts of one librarian focused on the application and server side management and a library worker who was familiar with MySQL query language and data management. This partnership proved invaluable in working with the nuances of configuring the SQL database to the necessary specifications. For any institution looking to have an uncustomized database, the WordPress installation configuration options work without any additional knowledge or customization necessary. The library's access to the AWS instance from the campus needed involvement by the campus Information Technology department's help desk to approve the IP address on file for the DNS configuration. In simpler terms, once the library set up the AWS instance with an elastic IP address (the term Amazon uses on AWS to refer to their ranges of IP addresses) and configured the domain information on Pressbooks through the installation, the library provided that information to the help desk and they updated the necessary documents and certificates. The last

piece of the process, inviting users to utilize installation, required the most patience and is an ongoing process.

In setting up the accounts locally, for more restricted access, Pressbooks provides only temporary account status to any created user accounts. This means if a faculty member has an account created for them by the institution in July but doesn't attempt to sign in to the account until September, Pressbooks will not hold onto that information in the SQL database. After a default period of three days, which is customizable through the WordPress configuration options, the username is not retained by the system and the new account creation process has to begin again. There are options to link the installation to a single sign-on system, such as Microsoft's ADFS or a program such as Shibboleth or Google Apps. Directions for setting up this configuration option are also available as part of Pressbooks documentation on their website.

At the University of Dubuque, having a small FTE allows for more time to work closely with a faculty member throughout the OER creation process, as the faculty are more flexible with their time. The current process of creating accounts as needed, on an individual basis, works well when handling limited requests. Larger institutions that would utilize this method of configuration might find it easier to streamline the request through a single sign-on system, an authentication method that is automated through an administrator or Pressbooks or another program.

ADDITIONAL NEEDS

After the rollout of the Pressbooks site to the campus community, we encountered additional needs for our instance that weren't configured as part of the base installation of the site. For faculty members registered for an account on the site, Pressbooks would allow their account to have basic user access to the features necessary to start creating their OER. However, this did not allow for the usage of a majority of the features that Pressbooks offers. Part of this disconnect stemmed from the way the accounts were created on our multisite instance. Accounts created need to be manually added and confirmed as an existing account on the Pressbooks site as an author in order to allow access to the full suite of options available for the OER creation.

The other hang-up in access for faculty came from the way Pressbooks handles email for new registration, password change information, or any type of communication. Prior to June 2020, developers were able to simply connect a WordPress site, or other sites, to Gmail using a simple authentication of their account using their username and password. In June 2020, Google required users who want to utilize Gmail to send emails from a new site, or in this case a locally created instance of a WordPress multisite for Pressbooks, to authenticate their account information by authorizing the site through a Google Developer API, paying for access to the plugin that would allow for configuration of Gmail, Outlook, or other email providers, or rely on the site maintainers to configure their own email services through the server itself.[12] If it is built into the budget of the university to purchase and subscribe to a service provided by a plugin owner, that option works without additional server configuration. Our institution, however, was limited in its payment options and was unable to utilize standard forms of payment required by the plugin providers. As such, we are manually reviewing the registration requests for the site and creating accounts on Pressbooks on an as-needed basis.

CONCLUDING THOUGHTS

The University of Dubuque's initial introduction to Pressbooks came from attending the Library Technical Conference 2019, held at Macalester College in Minnesota. While there, representatives from the MnPals consortium walked through the work done between the University of Minnesota and the state library system to integrate their instance of Pressbooks throughout public library systems and university systems.[13] The work done at our institution is at a significantly smaller scale, only being utilized by faculty members at the university and members of the university community, including adjunct professors and professional staff. While work on a consortium level can proceed quickly, as there are multiple parties involved in the creation of the resource, we at the University of Dubuque had a small number of people immediately working on the project. The discussion between the two personnel in the library handling the system work and the director of the library took the longest amount of time, followed by a couple of months between contact with Pressbooks about pricing, hosting through them, and conversations at the state level attempting to gauge interest from additional parties to partner with. Initial conversations at local state conferences, with the larger public institution librarians participating in discussions, didn't evolve into an actionable plan. From there, the planning for the setup of the AWS instance to install WordPress and Pressbooks took a month to set up. Another two weeks were spent working with the MySQL database to customize it to the university's needs and upload the instructor book used as the pilot upload. From start to finish, seven months passed to the launch and rollout of the product. Since the launch of the platform, work has started on identifying faculty who would benefit from using Pressbooks, with surveys across the institution to glean insight into what faculty are currently doing, how they and their students can benefit from this, and all the steps involved.

With the work done at the University of Dubuque, operating as a private, smaller university allowed for more flexibility in our adoption of technology, a more focused approach to introducing new systems to the university at large, and a less bureaucratic approach to seeking approval. In the library, we recognized that we were in a unique position to begin this development and implementation rapidly for the university and took advantage of that.

ENDNOTES

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