An Online Hub for Undergraduate Research

Leveraging an institutional repository to engage students & disseminate research

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Background

Cal Poly Pomona students who participate in undergraduate research have the opportunity to become more actively involved in their disciplines and to embody the 'learn by doing' culture at Cal Poly Pomona. These research activities, however, were difficult to track on campus. The STEP NSF grant team, the Office of Undergraduate Research and the Undergraduate Research Faculty Advisory Council identified a need for improved tracking of undergraduate research activities. Repositories offer a sustainable space for storing documents and are an excellent means of maintaining and promoting student scholarship. The University Library and the STEP NSF Grant program worked together on a pilot project to launch an undergraduate research focused institutional repository to better track and showcase undergraduate research at Cal Poly Pomona.

Goals

The University Library, the Office of Undergraduate Research, and the STEP NSF Program are most interested in providing a static representation of undergraduate scholarship at Cal Poly Pomona. Undergraduate research involvement has historically been difficult to track and a repository can fill a need to track student scholarship across the university. Specific repository goals include the following:

- Facilitate connections between students and prospective faculty mentors: Students can search the repository according to research interests and determine which faculty members might be most appropriate to contact regarding potential opportunities for assisting with research.
- Understand expectations: Students can view prior papers, projects, and reports written by previous undergraduate research student participants to better understand what those kinds of projects might entail.
- Collaborate with faculty as well as with student peers: Students have opportunities to connect with peers in their programs with whom they could collaborate, or even uncover opportunities to co-author or co-present with faculty mentors.
- Showcase Research: Students have static links to scholarship they have created while at Cal Poly Pomona, which can be used for graduate school applications, shared with potential employers, featured on professional social networking sites as well as many other venues. The research found via links is Cal Poly Pomona branded and links are optimized for search engine discovery.

Successes of Undergraduate Research in Repositories

Institutional repositories have traditionally been implemented for the purposes of increasing access, raising visibility, and improving preservation of items created by a university's faculty and students (Nabe, 2010). When institutional repositories were first developed they were often utilized both successfully and unsuccessfully to house faculty publications (Salo, 2008). Fledgling repository projects were often plagued with problems such as lack of participation, negative feedback, and slow adoption. Jain (2010) acknowledges two schools of thought with repositories: those who believe that repositories have been largely unsuccessful and those who believe a repository can successfully present and feature scholarship from the institution. Other researchers claim various future benefits of repositories. Shreeves & Cragin (2008) discuss the frequently unsuccessful prior model of using a repository to reduce libraries' costs associated with academic journal subscriptions. They suggest a number of alternative uses for repositories that could result in increased usage and ultimate success. Tananbaum (2013) presents the historic possibilities associated with an institutional repository and compares these to new directions for the future. Duranceau (2008) envisions the institutional repository as an integral part of the concept of "scholarly commons" where different types of research can be shared. More recent studies show that original work, especially student research projects, are the most frequently downloaded items in institutional repositories at many institutions with a similar composition to Cal Poly Pomona (Connell, 2011; Royster, 2008; Levy et al, 2012, Jean et al, 2010). When considering these repository successes for undergraduate research compared to the challenges of maintaining a repository consisting primarily of faculty scholarship, the University Library and the Office of Undergraduate Research saw an opportunity to use a repository to highlight and feature undergraduate research.

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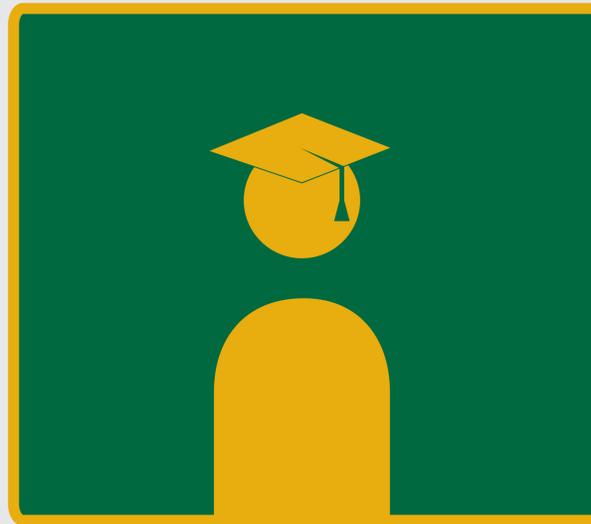- Salo, D. (2008, Fall). Innkeeper at the roach motel. Library Trends 57(2), 98–123.
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What can a Student do?

- Connect to Faculty with Research Interests
- Understand Expectations
- Collaborate with Faculty & Student Peers
- Showcase Research

Selecting & Customizing a Repository

A number of common repository systems can be used for housing student research including DSpace, Digital Commons, CONTENTdm, DigiTool, among others. Each of these repositories have unique features such as varying levels and types of tracking capabilities, different user interfaces for user-generated submissions, and various workflow systems. As part of the process of establishing a repository for the primary purpose of featuring student research, the following key requirements were established for the repository:

- Content can be searched by keyword
- Content can be browsed by discipline
- Content should be linked to a faculty member

Customizing the repository to suit these requirements included these steps:

1. Reviewing sample repositories from other California State Universities, similar universities outside California, and well-known repositories: The University Library was particularly interested in understanding how other similar teaching institutions were representing student research activities.
2. Selecting software and customizing that software to represent the university: The software had to have reporting capabilities (or have the capability of adding reporting functionalities if they were not available out of the box), had to be capable of housing 'profiles' for students and faculty mentors, and had to have advanced metadata functions to ensure that items could be extensively tagged with appropriate metadata thereby improving search and findability.
3. Drafting workflows for processing content: Items included in the repository should be an exemplary representation of student work completed at Cal Poly Pomona. Workflows were established not just for uploading content but also for establishing faculty mentor approval processes.
4. Creating policies: Any repository requires minimal policies regarding collection development, withdrawal policies, embargo policies, distribution agreements and more. The University Library referenced policies and agreements from repositories such as IDEALS from University of Illinois, Cornell University, and other California State Universities for guidance on policies.

The new repository Bronco Scholar was launched in February 2014. As of June 26, 2014, nearly 200 items have been uploaded including ~135 undergraduate research submissions.

Featuring Students

Students were featured in a number of ways in Bronco Scholar:

- Creation of feature pages for students in special programs such as the McNair Scholars. Students were particularly excited by these feature pages since they are static links that can be shared with grad schools, potential employers, and friends and family
- Inclusion of research summaries, papers, and posters from the annual Student Research Conference
- Inclusion of exemplary student research on a case-by-case basis with approval from a faculty mentor

Getting Buy-In

Some repositories have suffered under a "build it and they will come" strategy, which more often than not has led to disappointing results and sometimes failure (Salo, 2008). Various researchers have stressed the importance of marketing and outreach in repository initiatives (Nabe, 2010; Jantz, 2008; Ramirez & Miller, 2013). The Cal Poly Pomona University Library reviewed methods that other repositories were utilizing to market their services and modeled marketing initiatives after those conducted at universities such as Cornell University, Southern Illinois University Carbondale, and Cal Poly San Luis Obispo. Marketing the repository to the wider campus community via various methods has become the primary focus for the repository team after launch. In partnership with the Office of Undergraduate Research, the University Library has developed the following means of reaching faculty and students who could potentially contribute to Bronco Scholar either as faculty mentors for undergraduate research or as student researchers.

- Production of a brochure publicizing Bronco Scholar and the benefits of submitting to a repository
- Meetings with individual departments throughout the college to publicize the purposes of Bronco Scholar especially in regards to tracking and featuring student research
- Development of a repository 'Talking Points' document for librarian liaisons to use in discussions with their respective departments
- Development of web graphics and materials to promote Bronco Scholar
- Promotion via social networking and campus news channels
- Production of video marketing materials to encourage student submissions

Future Directions

- Marketing: Marketing of the repository will continue at department meetings, through printed and electronic publicity, and via other outreach mechanisms. Future marketing may also target ways that the repository can potentially assist faculty in reporting advised undergraduate research activities.
- Workshops: In partnership with the Office of Undergraduate Research, workshops on Bronco Scholar functionalities and benefits will be organized for interested student researchers.
- Additional student research categories: Scholar programs on campus are being contacted to solicit interest and submissions of exemplary program scholars similar to the McNair scholars. Additionally, faculty approved student research projects and papers will be accepted as more faculty become aware of Bronco Scholar.
- Improved analytics and reporting: The software DSpace has limited functions for reporting statistics and only reports downloads or 'bitstream views.' Google Analytics combined with Google Tag Manager have been incorporated in Bronco Scholar to ensure that all kinds of analytics are tagged including page views and downloads. Additionally, Google Analytics Dimension Widening is being used to track by more granular metadata such as author, title, department, and advisor.
- Better software: DSpace is a broadly used repository software, however, a proprietary software with increased tracking capabilities might be preferable long-term to ensure that the repository is more usable and more inviting for participation.
- Bronco Scholar as a sustainability option: Bronco Scholar, due to its persistent nature, can also offer sustainable access to grant related scholarship, learning materials, etc.