

You Belong in the STEM Library

Outreach Addressing the Unique Needs of Students

Science, technology, engineering, and math (STEM) students at Penn State University's University Park (PSU UP) Campus embody a hard-working and disparate group of individuals. Students in the STEM fields major in everything from mechanical engineering to math to nursing and more. The undergraduate and graduate student demographics are even more diverse than their majors, with traditional, nontraditional, first-generation, and veteran students, as well as international students from more than 80 countries. The PSU administration has recently begun to vocally advocate for intentional work to center a sense of belonging for all students.¹ We believe belonging is central and essential for an academic library space, and the administrative support has encouraged more active approaches. This article reflects on our efforts to foster this sense of belonging for all students in the PSU UP STEM Libraries.

About PSU's STEM Libraries

The STEM Libraries at PSU UP have a unique advantage in consisting of four separate library spaces. Three of those, the Fletcher L. Byrom Earth and Mineral Sciences Library, the Engineering Library, and the Physical and Mathematical Sciences Library, are branch libraries, physically located in proximity to the departments they serve. The fourth, the Life Sciences Library, is located within the Pattee-Paterno Library, the largest on campus. In these spaces, 14 librarians, seven full-time staff members, and four part-time staff members provide instruction, reference, and outreach directly to STEM students. As of the fall 2023 semester, there were 21,769 STEM undergraduate students and 3,823 graduate students, totaling 25,592 enrolled at the UP Campus.² This is just over 52% of the campus student population.

A few other librarians who directly support the STEM community but work in other libraries come from the William and Joan Schreyer Business Library, Research Informatics and Publishing, and the Harrell Health Sciences Library. Campus-wide outreach is spearheaded by the excellent Library Learning Service Department, which allows the STEM libraries to target their outreach. Across their various locations on the UP Campus, these librarians are in the process of disrupting their traditional campus outreach model to better serve the unique and diverse needs of STEM students.

A central theme across the differing events and activities has been to build a sense of belonging and ownership within the libraries' spaces for all STEM students. Librarian support

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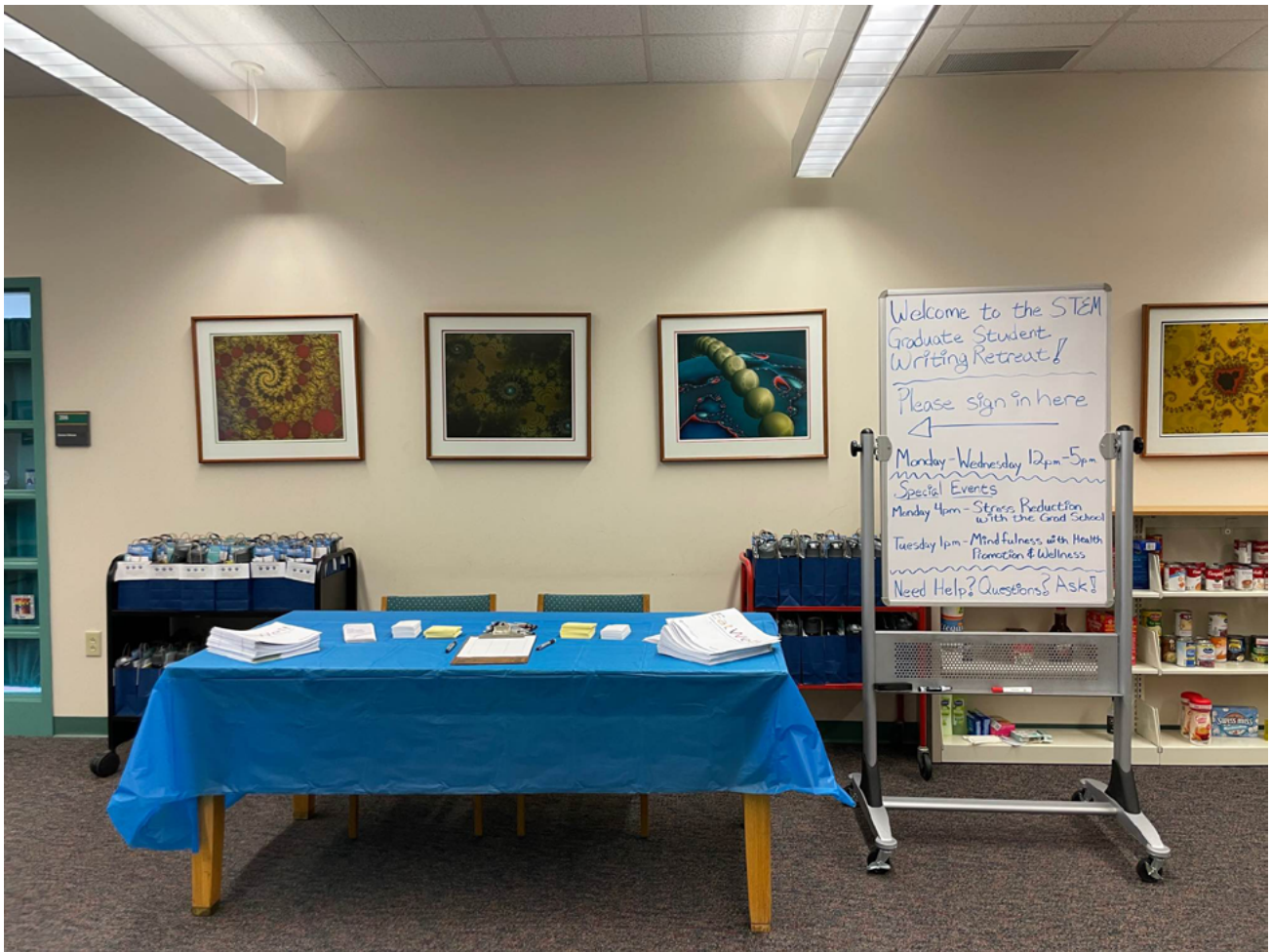
can allow students to feel included in their communities, and students are more likely to feel a sense of belonging when they are physically present in the library.³ Most students carry around a metaphorical backpack of experiences with them, and libraries can be a place to rest. Alyson L. Mahar, Virginie Cobigo, and Heather Stuart also noted that a physical and social environment can impact a student's sense of belonging. Having access to a physical space dedicated to a student's own major or studies allows them to fit in "somewhere."⁴ As mentioned before, the STEM Libraries at PSU UP have an uncommon advantage of being branch libraries housed in academic departments. Many of the outreach efforts described below were designed to leverage that advantage. We have focused our outreach efforts on events, so they are centered in this narrative. These events have given us the opportunity to obtain direct feedback from attendees to continue to improve our efforts. We mention more passive programming as well and acknowledge that these efforts can also be highly impactful.

Undergraduate Students Shape the Library They Want

Building partnerships with student organizations encourages students to feel a sense of ownership of the library space and helps librarians develop displays and programming directly tied to student interest. These groups have already been identified to improve students' sense of belonging.⁵ The mutually beneficial relationship of a partnership, especially with undergraduate student organizations that already improve students' sense of belonging, provides a shortcut to helping students see themselves in the library. However, during the COVID-19 pandemic, many existing student organization–librarian relationships faltered or disappeared; rebuilding these partnerships was identified as an essential part of strengthening ties to students.

One of the most successful renewed partnerships in spring 2023 was with the PSU Math Club to celebrate Pi Day at the Physical and Mathematical Sciences Library. The event featured an array of activities at the library, with Pizza Pi(e) as the food of choice. The PSU Math Club provided the pizza, and club officers worked with the math librarian to set up the celebration. Students made Pi Day buttons using a button maker, found their birthday in Pi using the Pi Day website, and solved the 2023 NASA Pi Day problems published by the California Institute of Technology's Jet Propulsion Laboratory.⁶ There was even a Pi workshop provided by PSU Math Club students about finding Pi in everyday scenarios. This event encouraged students to embrace and shape their library experience. It also helped to showcase the PSU Math Club to other students, as the club had also experienced significant change since 2020. This partnership ensured the event was of interest to a portion of the STEM student population while providing marketing for the student group.

Other spaces, like the Engineering Library, have partnered with undergraduate student organizations to create displays tied to the club theme. Some displays were paired with celebratory months, like one by the National Society for Black Engineers during Black History Month and the Society of Women Engineers during Women's History Month. Others, like a display on Interlibrary Loan, were based on student interest.⁷ Like partnering for events, these displays highlighted an interest to some of the STEM student population, provided marketing for the group, and helped students not in the group learn about a topic important to their fellow students.



STEM Grad Writing Retreat The PSU Libraries registration table for the STEM Graduate Student Writing Retreat. On the carts behind the table are the prepared study packs. A food pantry is shown in the back right of the photo as well, which is one of three housed at PSU Libraries University Park campus.

Addressing the Unique Needs of Graduate Students

Graduate students may be less active in student clubs and organizations due to their heavy workloads and the narrow focus of their research. Rather than developing a partnership, we focused instead on helping graduate students build connections with other graduate students in the library as a space through a STEM Graduate Student Mixer. This event included some information about PSU Libraries but centered on cross-department individual connections. Because this was the first major event post-pandemic, the mixer functioned as a proof of concept that in-person events would attract STEM graduate students. PSU Libraries provided food and giveaways tied to participation in the human bingo game. It was a success, with students interacting with each other and with attending STEM librarians. Before the event was even over, graduate students immediately asked when similar events would be taking place.

Buoyed by this success, the librarians considered additional events to target the specific needs of STEM graduate students. This inspired a STEM Graduate Student Writing Retreat held at the Physical and Mathematical Sciences Library during Spring Break 2023. Most undergraduate students leave campus during break, so “taking over” most of the library space to create a space for graduate students to write did not disrupt other library users. The three-day event featured the first STEM Libraries partnership with PSU’s Graduate School and the Penn State Health Promotion and Wellness Program. Looking to create



The PSU Libraries Department of Research Informatics and Publishing folks prepare to greet students and postdocs during the STEM-H Graduate Student & Postdoc Mixer in September 2023.

a supportive writing environment, students pre-registered for the event so that food and resources could be prepared ahead of time. All attendees received a “Writing Focus Bag,” which featured writing tools, stress balls, and giveaways from both partners to promote writing and well-being. In a holistic approach to student success, these giveaways, coupled with stress reduction workshops provided by both partners, helped to create a synergistic atmosphere. Post-event surveys to attendees indicated that more than 99% of students found their event conducive to making progress on their writing goals. Several survey comments implored STEM Libraries to host more of these events each semester.

The 2023 Graduate Student Mixer was renamed the STEM-H Graduate Student and Postdoc Mixer to clearly indicate it as a space for Health students, as well as postdocs, as both groups reported uncertainty about their standing within STEM. The mixer had two goals: first, to help attendees build connections with other attendees, and second, to inform attendees about library and partner services. While the focus of the previous year’s event was more social in nature, this year’s focus was both social and informational. The mixer, held at the Physical and Mathematical Sciences Library, included partners and activity stations throughout the library space to encourage attendee engagement. Partners for the event included PSU’s Graduate School, PSU’s Graduate Student Writing Center, PSU Libraries Research Informatics and Publishing, and the Graduate Student Career and Professional Development Center. Most attendees arrived when the event kicked off and stayed until the end. The atmosphere was relaxed and congenial. The students excitedly conversed with

those staffing the information stations, discussing how they might use these resources and creating groups as they chatted with new friends.

Outreach for All

To develop even broader programming, PSU Libraries held its first ever World Standards Week Celebration in October 2022, with the theme of “Imagine a World with Standards.”⁸ To expand the reach of this event even more, planning for this event included librarians across six PSU campuses collaborating to bring an event to engineering students, staff, faculty, and postdoctoral scholars at campuses with strong engineering programs across Pennsylvania. Librarians at the UP campus used Zoom to synchronously share a short presentation about technical standards and how to find and access them with PSU Libraries. Then groups at each campus engaged in group activities to imagine their world without standards. The groups identified standards necessary for the functioning of daily activities, like buying a coffee or using transportation to reach class, and then created stories about what could go wrong without these standards. Groups then came back together on Zoom to share their stories with participants across the Commonwealth. Participants embraced the event and approached the problems creatively; some groups even wrote haikus about the situations being discussed.

Although there are many opportunities for the librarians to share knowledge and resources each year through new student orientations, course instruction, creation of learning assets, and in-library outreach, expanding outreach beyond the library setting is essential to reaching other members of our community. In August 2023, we expanded outreach to an even greater extent. For the first time, PSU Libraries shared information and resources at the Living In Our Neighborhood (LION) Bash, a part block party, part resource fair that connects students, community members, and organizations together at the start of each academic year.⁹ At this event, we showcased the STEM Libraries and the Patent and Trademark Resource Center housed in the PSU Libraries. This event allowed STEM librarians the opportunity to share their expertise and services outside of the traditional library setting, allowing us to connect with students that may not have been aware of all the resources available to them. The LION Bash also brought the University’s land grant mission into focus, as PSU is dedicated to serving all the state’s citizens through education and access.

Outreach Takeaways

Based on our experiences, you may find the following points helpful in your own outreach to STEM students and beyond.

Know your audience. A recent change in fall 2023 was adding Health directly to marketing efforts, thus changing STEM to STEM-H. As hosts, STEM librarians found that while Health and Nursing Librarians are housed in the Life Sciences Library, the students themselves do not always identify as STEM. This change was made to improve inclusivity among majors, while, at the same time, creating a greater sense of belonging for students. The rollout of STEM-H in programming has seen modest success.

Partnerships can lead to stronger programming. Programming that allows librarians to share what they do is bound to be a success. Building and maintaining partnerships outside of the library allows for this focus and an even greater engagement experience for students during outreach events.

Consider the whole student. In the example of the writing retreat, workshops on stress reduction and wellness were provided by campus partners. Students need to write, finish projects, and be in the business of being a student. But the thoughtful addition of holistic well-being content and social parameters to any outreach program can demonstrate that a library does care.

Conclusion

Students face many pressures during their academic careers, and outreach through libraries serves as a method to increase their sense of belonging, especially in the physical space of the library. This work is an ongoing initiative to develop outreach opportunities to meet the needs of the STEM student population, while also leveraging the unique advantage that the STEM libraries offer. ❧

Notes

1. “Penn State Statement on Belonging,” Penn State Educational Equity, accessed October 25, 2023, <https://equity.psu.edu/equity-at-penn-state/belonging-statement>.
2. “Student Enrollment | Data Digest,” accessed October 25, 2023, <https://datadigest.psu.edu/student-enrollment/>.
3. Nahid Bayat Bodaghi et al., “Friendly Librarians: The Culture of Caring and Inclusion Experiences of Visually Impaired Students in an Academic Library,” *Information Development* 33, no. 3 (June 1, 2017): 229–42, <https://doi.org/10.1177/0266666916641178>; Jung Mi Scoulas, “College Students’ Perceptions on Sense of Belonging and Inclusion at the Academic Library during COVID-19,” *Journal of Academic Librarianship* 47, no. 6 (December 2021): 102460, <https://doi.org/10.1016/j.acalib.2021.102460>.
4. Alyson L. Mahar, Virginie Cobigo, and Heather Stuart, “Conceptualizing Belonging,” *Disability and Rehabilitation* 35, no. 12 (June 1, 2013): 1026–32, <https://doi.org/10.3109/09638288.2012.717584>.
5. Tierra M. Freeman, Lynley H. Anderman, and Jane M. Jensen, “Sense of Belonging in College Freshmen at the Classroom and Campus Levels,” *The Journal of Experimental Education* 75, no. 3 (2007): 203–20.
6. “Find Birthday in Pi | Pi Day,” accessed October 25, 2023, <https://www.piday.org/find-birthday-in-pi/>; “Student Project: The NASA Pi Day Challenge,” NASA/JPL Edu, accessed October 25, 2023, <https://www.jpl.nasa.gov/edu/nasapidaychallenge/>.
7. Paul McMonigle and Linda Struble, “Engineering Libraries and Student Organizations: Working Together to Enhance Outreach to Underrepresented Groups,” 2021, <https://scholarsphere.psu.edu/resources/8b57ec02-be36-422f-9602-4dbe2dfc78b9>.
8. Beverly Molnar, “University Libraries to Observe World Standards Week with Oct. 12 Event,” Penn State Harrisburg, accessed October 25, 2023, <https://harrisburg.psu.edu/story/35966/2022/09/28/university-libraries-observe-world-standards-week-oct-12-event>.
9. “Living in One Neighborhood (LION) Bash | State College, PA—Official Website,” accessed October 25, 2023, <https://www.statecollegepa.us/298/Living-in-One-Neighborhood-LION>.