

Project Title: Open Homework Systems: Planning and Piloting Library Support

Summary: The Penn State University Libraries, on behalf of the Public Services Directors of the libraries of the Big Ten Academic Alliance (BTAA), requests a grant of \$149,999 for a 2-year period to plan and pilot a library-led service model for supporting self-hosted, open source, online homework delivery systems as supplemental resources for teaching with open educational resources (OER). The BTAA Public Services Directors is a peer group of BTAA Library Initiatives, whose membership includes senior leaders from all fifteen of the world-class research libraries of the BTAA. The project proposed in this grant will be a joint project of the Public Services Directors. This project is intended to advance shared knowledge and learning opportunities for all students (IMLS Objective 1.1) and strengthen the ability of libraries to work collaboratively for the benefit of the communities we serve (NGL-L Goal 5). Supplemental homework systems are a requirement in many high-enrollment courses within STEM and foreign languages. Without access to an accompanying homework system, many faculty will not consider using OER instead of a commercial textbook, which is often bundled with homework platform access and other ancillary materials. This project will produce findings that help libraries expand their OER programs to include support for open-source homework systems many faculty need in order to consider and adopt OER.

Project Justification: High-enrollment undergraduate courses in STEM and foreign language departments often use proprietary homework systems with commercial textbooks. Online homework systems provide faculty with key insights into student performance through interactive exercises, quizzes, and Learning Management System (LMS) integrations. The automation of student and instructor feedback make these products especially compelling options for departments that teach high-enrollment courses. Commercial textbook publishers often bundle online homework systems with their textbooks to simplify the textbook adoption process. Once adopted by an academic department, faculty are unlikely to consider OER alternatives – even when relevant, high-quality OER exist – because losing access to a homework system would make teaching high-enrollment courses significantly more difficult. As instructor reliance on proprietary homework platforms increases, the number of students who forgo purchasing access codes due to cost has increased as well -- from 17% in 2019 to 21% in 2020¹. Beyond the unaffordability of commercial homework systems, there is also a concern for student privacy. As was stated in SPARC's recently published guide to inclusive access programs, "With major textbook companies launching new apps and developing business strategies similar to Netflix or Amazon, the exploitation of students and faculty data raises legal, ethical, and strategic issues for institutions."² We believe it is essential that librarians create openly licensed alternatives to existing commercial homework systems as a way of protecting student and faculty data, enhancing existing OER offerings, and increasing accessibility of learning materials for students.

Project Work Plan: Building on the work of the Open Homework Systems Project of the BCcampus and using donated labor from librarians and specialists at participating BTAA institutions, we will perform an environmental scan on our campuses to identify specific departments and courses where purchasing access to an online homework system is required in addition to or as part of a commercial textbook. We expect this investigation to generate a list of proprietary homework systems and identify faculty partners who teach high-enrollment courses within the BTAA that may be interested in replacing their commercial textbook and online homework system with an OER and open homework system supported by the library. At the same time, we will investigate open-source homework systems options available for self-hosting to create a feature matrix for current versions of the software to enable us to understand their functionality and relevance for teaching. After

¹ PIRGs, S. (2021, February 24). Fixing the Broken Textbook Market, Third Edition. *Student PIRGs*. <https://studentpirgs.org/2021/02/24/fixing-the-broken-textbook-market-third-edition/>

² *Inclusive Access—Deal or Data Mine?* (n.d.). InclusiveAccess.Org. Retrieved August 23, 2022, from <https://www.inclusiveaccess.org/facts/deal-or-data-mine>

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identifying proprietary homework systems, open source homework systems, and possible high-enrollment courses within the BTAA, we will fund the work to pilot the use of OER and open homework systems in 9 courses across 3-5 institutions within the BTAA, including Northwestern University, Penn State, and the University of Minnesota, with the goal of using these pilots as a way of providing a proof of concept across several disciplines. As the BCcampus has noted, installing and managing servers for open homework systems (e.g., WeBWork or iMathAS) is a barrier for some institutions to provide these services to faculty themselves.

Therefore, we will partner with Unizin, a nonprofit organization that specializes in enabling higher education institutions to build technology solutions, to provide the technical infrastructure for all homework systems identified for the pilot. We will hire a graduate assistant to serve as the project manager responsible for coordination and communication among the project partners. We will also consult and collaborate with the Virtual Library of Virginia (VIVA) with the intent of learning from and building upon the review of platforms being conducted as part of their IMLS-funded project on open homework repositories. We will leverage the expertise of Unizin, the Open Education Network (OEN), and relevant librarians at BTAA institutions to develop best practices for cataloging the open content associated with homework systems to make it more discoverable in OER repositories and associate it with existing OER textbooks. We will produce a report of our findings in the form of an open toolkit for libraries with best practices and implementation guidance for starting and scaling support for open-source homework systems as part of their OER programs. The toolkit will be added to Penn State's open repository, and we will work with the OEN to promote the toolkit and any related training.

Project Results: If the project is successful, we believe that hosting and supporting open-source learning platforms could become a new service provided by libraries as part of their OER programs. Our project will provide libraries and library consortia with models for self-hosting and supporting existing homework systems that support interactive exercises and LMS integration. The results could show how library consortia or individual libraries could do this on their own. We believe our project will produce the following outcomes of national impact:

- Discover and prioritize subject areas that would benefit most from having free access to an open-source homework system
- List specific use cases that homework system software needs to support
- Curate resources and share an implementation strategy for universities to start or scale a self-hosted open-source homework systems service
- Implement best practices for discoverability of open-source homework systems
- Document which open-source homework systems are currently being used within BTAA institutions
- Provide recommendations on how libraries can support the development of open-source homework system software
- List open-source tools or systems that are currently missing from the market for homework systems on campuses
- Kickstart the next generation of open-source homework systems

Budget Summary: This 2-year planning grant totals \$149,864. A graduate assistant will be funded to provide project management (\$46,462) in salary, fringe, and tuition over two years), and faculty participants from 9 courses will each receive \$5,000 stipends (\$45,000 total) to adopt an OER and an appropriate homework system piloted through this project. The budget also includes \$6,652 for infrastructure costs including server and software maintenance and technical staff support. A 6-member advisory board will also receive \$500 each (\$3,000). Participating BTAA institutions will provide dedicated librarian staff time for research and analysis of existing open-source homework systems, and recruitment and support of faculty pilot participants. Penn State will receive 61% (\$48,750) in indirect costs.