VIVA

An Open Homework Repository to Aid Adoption Efforts in Open Education

Summary: With IMLS National Leadership Grants for Libraries program Goal 3, Objective 3.1 and Goal 1, Objective 1.1 as its aims, VIVA, a state-funded consortium of 71 academic libraries in Virginia, in cooperation with Notch8, a software development company with a proven record of contributing to open source software, and the Roy Rosenzweig Center for History and New Media (RRCHNM), the developers of Zotero, Omeka, and other academic digital tools, requests $148,276 for the development of a proof-of-concept open homework repository that will work in conjunction with learning management systems (LMS). This project will improve access to critical digital learning tools by creating an easily-adopted, discipline agnostic repository for ancillary materials for Open Education Resources (OER), including homework and test questions. Easily scaled and replicated by other institutions and consortia, this product will have the extensibility, sustainability, and scope to make a lasting impact on the cost and accessibility of higher education for students.

Project Justification: The cost of course materials contributes to increasing expenses that put higher education out of reach for many and impedes the success of those able to attend. Grant funded initiatives in OER, including the Department of Education's Open Textbooks Pilot Program, have worked to address the impact of those costs on student success. Like many other state library consortia, including Galileo in Georgia and the Louisiana Library Network, VIVA has a state-funded Open and Affordable Course Content Initiative that works to level the academic playing field for students through grants, outreach, and tools to increase discoverability of OER. These efforts seek to reduce the cost of education and reduce the Drop/Fail/Withdraw rates that data suggests are the result of high textbook costs.

The high price of textbooks is often compounded by the cost of homework platforms – online spaces in which students can turn in homework, gain instant feedback, and complete assignments. These platforms also require access codes that add to course costs—costs that cannot be mitigated through popular coping strategies like buying used texts or sharing texts with friends. Without access to user-friendly homework platforms, many instructors are reluctant to adopt OER that would eliminate course material costs. In its ongoing VIVA Open Grant Program, VIVA receives regular inquiries from faculty wanting to create questions and assessments that can be shared with other faculty in open test banks, but who have no way to store and share the material. Repositories like OER Commons lack permissions specificity that prevent students from finding the questions—and answers—that instructors hope to assign. They also lack the question-level metadata that would allow instructors to search through hundreds of questions in order to find the ones they need to create quizzes and tests.

The need for affordable alternatives to expensive homework platforms has not gone unnoticed. In 2019, Open Oregon, a consortium of academic libraries in the state of Oregon, worked with researcher Robert Bodily to produce a white paper, "Report on Lack of Homework Systems as a Barrier to the Adoption of Open Educational Resources," the results of which have informed this proposal. In response to the need for an innovative platform to use with their own OER, LibreText has developed ADAPT, a homework platform that is open source but which anticipates costs of $5/FTE for institutions to use. In addition, the platform requires use with a pre-existing repository, such as MyOpenMath, or that the questions be created in H5P, a web-based framework for creating interactive questions. These obstacles may leave faculty willing to generate open, ancillary course content with significant technological or financial hurdles. Some discipline-specific open repositories have also been developed (for example, [MyOpenMath](#) and [WeBWorK](#)), but there is not one that could serve as a solution across disciplines.

What is needed is a discipline-agnostic repository with a robust and extensible API, but technologically simple user interface. The proposed proof-of-concept repository will allow the structured and protected exchange of open ancillary materials, regardless of discipline, that is currently not possible. In addition, institutions often provide access to an LMS as a basic way for instructors and students to keep track of assignments and grades. An LMS-compatible repository for storing, tagging, searching, and sharing those assignments and test questions could leverage the power of LMS for open education. To provide the foundation for a future fully-integrated system, the prototype will also include an API planned to be extensible enough to be integrated into multiple institutional LMS. It is anticipated that this would offer the labor-saving aspects of more expensive tools by allowing students to take exams, turn in homework and see their grades calculated and recorded without the cost of an expensive platform and in compliance with FERPA. In addition, an LMS-

compatible system would build off of known tools instructors already use in their teaching. An extensible repository that could integrate into future open homework platforms would also provide a foundational tool that can grow as open alternatives to homework platforms are developed.

Project Work Plan: In the first phase of this two-year project, we will convene an advisory board consisting of representatives of VIVA, Notch8, and RRCHNM, as well as representatives from at least two other library consortia (drawn from the existing pool of interested consortia already consulted about this project), an instructional designer, and three faculty members representing a range of institution types (research doctoral, four-year comprehensive, and two-year/community college) and disciplines. The advisory board will, in consultation with the instructional designer, review existing platforms and define essential functionality and accessibility requirements for the repository. In Phase Two, Notch8, a Samvera Partner, will develop a proof-of-concept Ruby on Rails-based web repository to hold course texts, assignments, and other media files. Content in this phase of development will be disciplinarily scoped, and contributed by the participating faculty members with subject matter expertise and proven experience in open education. On completion of the prototype, Phase Three will see RRCHNM, which has extensive experience testing educational products in a variety of higher education environments, work with faculty to test the repository in their classrooms and gather student success data, as well as user feedback. In Phase Four, the Advisory Board will be responsible for assessing the preliminary results of the prototype testing and student data, and developing a road map for the further development of the repository and adoption of the repository at other institutions and consortia.

Diversity Plan: As increasing access to digital pedagogical tools is a central goal of this project, close attention will be given to diversity of student and faculty needs and disciplines in the planning and execution of each phase of the project. Selection of participants will take into consideration institutional student need as demonstrated by total number of Pell Grant eligible students currently enrolled. The subject matter consultants will have demonstrated expertise in serving underrepresented student populations and will be committed to generating content for testing that is representative of a wide array of assessment types and communities in order to ensure students with a variety of learning needs and backgrounds can be equitably served by the repository. Instructional design reviews will include accessibility requirements.

Project Results: Library consortia and open education leaders engaged in the work of leveling the playing field for students and instructors at institutions of higher education throughout the United States report a growing need for a homework platform that is free, easily accessible, and discipline-agnostic. Because these homework systems are expensive and a barrier to the adoption of other low and no-cost course materials, developing a homework repository that has an API that allows for integration into an LMS or open homework platform will benefit students and teachers at every level of higher education. It has the added pedagogical advantage of supporting teaching faculty in providing homework and test solutions that they can adapt to align with their individual courses, rather than relying on static materials that are pre-packaged with an existing text. In addition, for libraries and institutions with programs aimed at increasing the adoption of OER, aggregating the associated ancillary materials, such as quiz questions and exams, through a homework repository that can then be shared with other faculty increases the reach of open education, strengthens ties among faculty across institutions, and helps standardize access to resources at a variety of campuses nationwide. The resulting community developed prototype will provide a map for the further development of a scalable and sustainable open homework repository.

Budget Summary: The initial planning phase will have a total budget of $148,276 over two years. VIVA will provide support through dedicating staff time to project management. Three faculty members participating in the advisory board and developing content for the prototype will receive $2,000 each. An instructional designer will conduct an accessibility review, assess the results of beta testing, lead the evaluation of the results, and present the results to the advisory board for a total of $27,000 over two years. Twenty faculty participating in beta testing will be offered $200 honoraria in recognition of their time for a total of $4,000. At $150/hour, the development budget for Notch8 includes 375 hours of development, project management, and quality assurance time for a total budget of $56,250. RRCHNM, in consultation with the instructional designer, will manage testing the platform with faculty focus groups across disciplines for $22,500. Mason University will receive 28.1% in indirect costs.