The FASEB Journal / Volume 36, Issue S1

Biochemistry and Molecular Biology | Free Access

You gotta work, BASIL! Reimagining an established CURE to provide high-quality digital learning experiences that are intentionally equitable, inclusive and accessible for all students

Arthur K. Sikora, Bonnie Hall, Steven Mills, Rebecca Roberts, Paul Craig

First published: 13 May 2022
https://doi.org/10.1096/fasebj.2022.36.S1.R3061

NSF IUSE # 1709805

Abstract

In recent years, Course-based Undergraduate Research Experiences (CUREs) have become increasingly valuable models to cultivate student interest in research, especially when few other research opportunities at an institution exist. Since the start of the COVID-19 pandemic, there has been the need to operate in an online environment while maintaining high standards. Biochemistry Authentic Student Inquiry Lab (BASIL) students hypothesize and test functions of enzymes from the Protein Data Bank with no known function, utilizing a combination of wet-lab and computational approaches. Here we describe how this CURE was adapted to an online format, simulating the lab environment using a low stakes iterative assessment. Using Google forms, students answer questions about experimental background, procedure and lab safety that correlate with published BASIL experiments. Using a mix of multiple choice, free response, and video/ image-based questions, students engage with the material at a deeper level despite not being physically present in the lab. These forms can function as self-contained experiments or pre-lab/post-lab assignments to enhance the in-lab experience. The BASIL consortium is dedicated to developing high-quality teaching and learning experiences to reach and engage the modern learner. This CURE is flexible and has been found to improve the levels of personal comprehension and knowledge of STEM concepts and research design in students. These online modules provide another way for learners to reap the benefit of research-based courses in an ever-changing educational landscape. Built to equitably and inclusively reach and engage all students, these tools integrate intentional opportunities for community-building and interaction only possible in the digital environment. Novel strategies developed to accommodate all students will help to enhance exposure for undergraduate students to

> vital STEM research experiences and promote sustainability for institutions.

This is the full abstract presented at the Experimental Biology meeting and is only available in HTML format. There are no additional versions or additional content available for this abstract.