From Learning to Earning:
Reducing Instructional Material Costs With Technology and Innovation

Elaine Correa, California State University, Bakersfield, United States
Alexander Reid, California State University, Bakersfield, United States

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Abstract

"From Learning to Earning: Reducing Instructional Materials Costs with Technology and Innovation" is funded by a Department of Education 2023 Open Textbook Pilot (OTP) program Fund for the Improvement of Postsecondary Education (FIPSE) grant award. Decreases in student enrollment, precipitated by the global pandemic have directed attention by administrators on how affordable learning solutions such as Open Educational Resources (OER), and Open Educational Pedagogy (OEP) can be utilized by faculty to address what Colvard et al. (2018) refers to as the three most important concerns in higher education: academic quality, affordability, and high degree completion rates for students. Research on OER/OEP has demonstrated that performance gaps have narrowed, and failure/withdrawal rates have been reduced in some contexts, (Winitzky-Stephens & Pickavance, 2017), however, more attention is needed to ensure that culturally relevant content and pedagogy are an integral part of OER/OEP course adoption. Educators must be mindful to avoid solely replicating Eurocentric content and pedagogies in their OER/OEP selection. From our survey data, we highlight the impact of OER/OEP on student retention and success, with a focus on low-income and underrepresented minority student populations that we serve. We examine student academic motivation, engagement, and stress. We consider the resources that are necessary to provide students with equitable access to learning and examine what OER offers students who experience limited access to technology to learn. Our internal campus-wide survey illustrated some of the challenges and benefits of using OER/OEP for students with a pathway from learning to earning within the workforce.

Keywords: Open Educational Resources, Technology Innovation, Culturally Relevant Pedagogy

Introduction

Decreases in student enrollment, precipitated by the global pandemic have directed attention by administrators on how affordable learning solutions such as Open Educational Resources (OER), and Open Educational Pedagogy (OEP) can be utilized by faculty to improve enrollment and completion rates to graduation. The recognition of the benefits of OER and OEP to student learning has helped to increase OER and OEP adoption. Additional pressure from Governor Newsom's Compact agreement with the California State University system, has instigated greater attention and interest to meeting the compact agreement of reducing instructional costs for students by 50% by 2025. As the California State University System is, the largest public system of higher education in the United States with 23 campuses spread across the State of California, the adoption of the California Compact will have significant impact for students economically and should subsequently increase graduation completion rates as well. This initiative has accelerated internal OER/ZCCM adoption campaigns across the CSU systemwide and has increased awareness of how technology and innovation can be utilized effectively to reduce instructional materials costs and improve opportunities for students from learning to earning.

Open Educational Resources (OER) and Zero Cost Course Materials (ZCCM)

Open Educational Resources (OER) consists of openly licensed and distributed learning materials that are free of charge (United Nations Educational, Scientific, and Cultural Organization, 2019). Zero Cost Course Materials (ZCCM) comprise materials that are free and have no-cost to access or obtain. OER are educational materials, from single lessons to entire textbooks, that are free for faculty and students to use, customize, curate, and share. Evidence suggests OER materials are a viable affordability strategy for higher education, saving students—and often institutions—money (de los Arcos, et al., 2014). Providing all students with free materials on the first day of class also tends to level the academic playing field. Immediate access to course materials can also help to move the commitment to equity in learning practices forward with the distribution of educational resources available to all students. Courses that are designed as OER/ZCCM ensure that course materials are open and freely available and therefore no student is left behind.

Justification for OER/ZCCM

Within the context of the central valley, (San Joaquim region of California) there is only one four-year public institution of higher education within a 100-mile radius. As a designated Hispanic Serving Institution (HSI) and a Minority Serving Institution (MSI), the university is invested in serving undergraduate student populations where at least half of the institution's degree seeking students are low-income. According to 2023 CSUB Census data, the current student body consists of 9,399 students. Approximately 86% of those students are enrolled at the undergraduate level and earning their first bachelor's degree. Sixty-six percent of undergraduate students identify as female and 34% as male. Enrollment by race/ethnicity of undergraduate students consists of 68% Latino/Hispanic, 13% Caucasian or White, 7% Asian, 4% African American or Black, 4% race and ethnicity unknown and 2% of students as possessing two or more races. The majority of undergraduate students, approximately 74%, are under 25 years of age. Approximately 66% of CSUB students are first-generation college students (CSU, 2024).

Many of the students who attend the university have limited resources and are often working several jobs to afford the cost of their education. For many students today, the financial constraints associated with higher education, particularly in relation to textbook costs, enforces very stark choices between 'to eat' or 'to learn' (Correa & Bozarth, 2023). The escalating cost of textbooks remains a persistent impediment for students in general and specifically exacerbates difficulties that first-generation, low-income, and minoritized groups encounter in higher education. This is the case for public 4-year institutions in central California with a population that has been historically underserved, and consists of students who are Pell recipients, first generation, and many who are attending university part time (CSU, 2024). Furthermore, several students carry full time jobs to support their families while completing their degrees. Students must wager the price tag of their learning with realistic basic needs and lifestyle demands (Thune & Warner, 2019). In addition to the population demographic and socio-economic differences of the student body, there are also high levels of food insecurity within the local community. These differences are further noted in the stereotypical notions about the State of California and the level of wealth distributed across the State. Furthermore, while California is viewed as politically and socially liberal in terms of the State, Kern County is quite conservative. The major industries are oil and agriculture. Several people work in the big oil companies and can quickly earn high salaries with limited education, while a large population of an migrant worker works in the fields earning very low wages. This disparity is reflected also in the students that are served by the university.

Brief Literature Review

Research on Open Educational Resources (OER) and Open Educational Pedagogies or Practices (OEP) has demonstrated that performance gaps have narrowed, and failure/withdrawal rates have been reduced in some contexts, (Winitzky-Stephens & Pickavance, 2017), however, more attention is needed to ensure that culturally relevant content and pedagogy (Ladson-Billings, 1995) as well as digital inclusion and equity (Sturm & Pinsent-Johnson, 2020) are integrals parts of OER/OEP course adoptions.

The erroneous assumption that invokes greater disparities amongst learners is that in every home, students have immediate access to electronic devices, broadband connectivity, and the technical skills needed to successfully navigate learning on-line. Access on or before the first day of classes ensures equity in the distribution of educational resources. However, not all students have immediate, unfettered access or appropriate skills to avail of free resources that maybe available. Therefore, while digital inclusion may be the goal of OER/ZCCM course adoptions, attention must also be focused on ensuring that meaningful access is available to utilize the benefits of freely open resources (Sturm & Pinsent-Johnson, 2020).

For many students a pressing concern is affordability as the rising cost of tuition and course materials continues to serve as a barrier for many students to complete their degrees. Across the nation, degree completion rates, academic quality, and affordability are the three greatest challenges in higher education for students, their learning, and student academic success (Colvard et al., 2018). Educators must also be mindful to avoid solely replicating existing mainstream content and pedagogies in their OER/OEP selection. Additionally, educators must be cognizant of how they use OER/OEP to avoid contributing to the effects of the digital divide between the "have nots" from the "have lots" (Haight et al., 2014), exacerbating the socio-economic impacts on marginalized communities (Van Dijk, 2020), and to work towards assuring equitable access to learning.

The benefits of OER and OEP must also be reflected in terms of the academic quality of the materials that are available and adopted for use. A major concern amongst faculty is in ensuring quality OER in lieu of textbooks. It is well documented in the literature that high quality OER can lead to significant financial benefits for students and/or institutions, as well as reduce the potential for financial debt (Bliss et al., 2013; de los Arcos et al., 2014; Farrow et al., 2015; Fischer et al., 2015). Additionally, several studies have indicated that OER can effectively support at-risk learners in their efforts to finish their studies (de los Arcos et al., 2014; Farrow et al., 2015; Winitzky-Stephens & Pickavance, 2017). The goal is for students to reach the finish line and not be encountering excessive amounts of debt. Hence, high degree completions rates are of paramount importance to students, and the use of OER can help substantially to alleviate some of the financial burdens and stress imposed with soaring textbook costs.

Faculty must also be mindful of the implications of limited digital access, stable Wi-Fi connections or connectivity, broadband availability, and digital literacy skills and how these various components contribute to different levels of digital distress when navigating learning on-line (Reid & Correa, 2021). Unstable internet connections can lead to frequent disruptions in students' learning experiences. These interruptions may lead to missed content, and hinder students' ability to stay on track with their coursework. Thus, it is important for faculty to make OER materials available for students to download and access offline so they may remain engaged with the class even with limited internet access. Additionally, many courses incorporate multimedia content such as videos, interactive simulations, and online quizzes to enhance learning. Students with poor digital literacy skills may struggle to access and interact with this content, limiting their ability to engage with course materials and understand key concepts (Buzzetto-Hollywood et al., 2018; Reisdorf, 2020).

The Remixing of OER Textbooks using an Equity Lens (ROTEL) offers opportunities to invite students to contribute to their own learning in scholarly conversations by using their own voices and experiences. ROTEL addresses issues of diversity, representation, and accessibility within educational resources. This involves examining existing OER materials and identifying areas where they may be lacking in terms of representing diverse perspectives, cultures, and experiences. Developing inclusive and culturally responsive educational materials that better reflect the diversity of students and communities can help reduce disparities in education and provide all students with access to high-quality learning resources that are relevant to their backgrounds.

Pilot Study Framework

In our pilot study we will highlight the impact of OER/OEP on student retention and success, with a focus on low-income and underrepresented minority student populations that we serve. We are seeking to address digital distress, and identify solutions to narrow the digital divide, creating more spaces for diverse voices to participate in learning opportunities designed to level the uneven playing field of education associated with soaring educational costs. Our collaborative initiatives have been working to help resolve the lack of digital literacy and address ways to narrow the digital divide for vulnerable groups.

Funded by a grant from the Department of Education 2023 Open Textbook Pilot (OTP) program Fund for the Improvement of Postsecondary Education (FIPSE), we specifically consider the impact of OER/OEP on low income, underrepresented minority students on our campus. Institutional survey data will be examined with a focus on improving how faculty

seek, curate, expand, and promote OER/OEP adoption of free, culturally relevant, digitally inclusive affordable instructional materials and pedagogies.

We are specifically interested in student academic motivation, engagement, and stress. We raised the following preliminary questions for consideration: 1.) What impact will OER/OEP have on academic motivation? 2.) Will OER/OEP increase student engagement? and 3.) Does access to course materials 24/7 on their devices help to reduce stress for students? We were particularly concerned about avoiding the heavy reliance of ideas and approaches that privilege the global north context, and therefore, at a basic level, several questions will need to be considered in terms of what resources are necessary to provide students with equitable access to learning that is culturally relevant and inclusive? We recognized that educators must be mindful to avoid solely replicating Eurocentric content and pedagogies in their OER/OEP course and pedagogical selections.

Pilot Study Preliminary Findings

Research has found that there are several benefits of OER for students. For example, extracted from our preliminary end of the year department student survey (n=77) we noticed some strong trends and interest by students. Pilot study findings demonstrate that all students agreed or strongly agreed that the department should continue to utilize OER for courses at no-cost to students. Specifically, in terms of textbook fees, from our 2021 survey students reported the following: 79.5% of students reported spending **over $100** on textbooks for non-major classes (e.g., general education courses, electives) and 18% of students reported spending **over $300** on textbooks for non-major classes.

Some of the benefits and strengths identified by our students with the use of OER are as follows:

Table 1. Student Benefits of OER

Benefit	Students (n=77)
Save money	75.32%
Accessible	25.97%
Reduce stress	24.68%
Focus on learning/success	7.79%
Sustainable use	3.90%
Better understanding of content	2.60%
Support from faculty/staff	2.60%
Better attitude/motivation	1.30%
Physical health	1.30%

These responses indicate that cost savings, less strain on their physical bodies with not having to carry heavy textbooks, and access anytime, from anywhere are significant benefits to our students with OER adoption.

Table 2. Qualitative Student Feedback

"It's lifesaving! I saved so much money I didn't have to stress about my textbooks."
"Saves money, trees, and space. Also is not a burden on our backs due to backpacks being overly heavy."
"Can be accessed anywhere and by anyone at any time."

Grant Research Study

As indicated, our research study is funded by a Department of Education 2023 Open Textbook Pilot (OTP) program Fund for the Improvement of Postsecondary Education (FIPSE) grant award. This is a 3-year grant that spans from 2023 to 2026. One main objective of the current grant is to develop a Child Development and Family Studies OER Pipeline from community colleges to the California State University system and be a model for other departments to follow.

In addition to the pipeline, other objectives include developing an OER Assessment tool, facilitating OER Workshops that include trainings in OER, ADA/Copyright Compliance, Universal Design for Learning, and Digital Literacy. We plan to upload all our materials to a shared repository to provide access to these resources to educators across the globe.

Finally, we will conduct a study on student learning objectives in the context of OER classes, with an OER Pipeline, OER Assessment, OER Workshops, OER Cloud/Repository, and OER Research Study.

Conclusion

The integration of OER and OEP in higher education demonstrates the potential to enhance student learning experiences, narrow the digital divide, and promote equity, inclusion, and accessibility in education. The CSU's commitment to the California Compact of reducing instructional costs by 50% by 2025 further highlights the significance of initiatives aimed at implementing OER/OEP. Our project, supported by the U.S. Department of Education, aims to evaluate the impact of OER/OEP on student retention, success, and engagement, with a focus on low-income and underrepresented minority student populations. We plan to develop tools and resources to support the widespread adoption of OER across disciplines. By reducing instructional material costs with technology and innovation, we aim to create an inclusive environment for students to navigate their learning experiences towards earning degrees.

Acknowledgements

References

Bliss, T., Robinson, T. J., Hilton, J., & Wiley, D. A. (2013). An OER COUP: College teacher and student perceptions of open educational resources. *Journal of Interactive Media in Education*, *2013*(1), 4. https://doi.org/10.5334/2013-04

Buzzetto-Hollywood, N., Hwei Wang, Elobeid, M., & Elobaid, M. (2018). Addressing information literacy and the digital divide in higher education. *Interdisciplinary Journal of E-Learning & Learning Objects, 14*, 77–93. doi:10.28945/4029

California State University, Bakersfield. (2024). CSUB Fact Book 2024. Retrieved from https://www.csub.edu/about/_files/CSUB_FACT_BOOK_2024.pdf

Colvard, N. B., Watson, C. E., & Park, H. (2018). The impact of open educational resources on various student success metrics. *International Journal on Teaching and Learning in Higher Education, 30*(2), 262–276.

Correa, E. and Bozarth, S. (2023). To eat or to learn: Wagering the price tag of learning: Zero cost textbook degree. *Equity in Education and Society*. Sage Publications. https://doi.org/10.1177/27526461231154013 [doi.org]

de los Arcos, B., Farrow, R., Perryman, L.-A., Pitt, R. & Weller, M. (2014). OER Evidence Report 2013-2014. OER Research Hub. Available from http://oerresearchhub.org/about-2/reports/

Farrow, R., Pitt, R., Arcos, B., Perryman, L., Weller, M., & McAndrew, P. (2015). Impact of OER use on teaching and learning: Data from OER Research Hub (2013-2014). *British Journal of Educational Technology, 46*(5), 972–976. doi:10.1111/bjet.12310

Fischer, L., Hilton, J., Robinson, T. J., & Wiley, D. A. (2015). A multi-institutional study of the impact of open textbook adoption on the learning outcomes of post-secondary students. *Journal of Computing in Higher Education, 27*(3), 159–172. doi:10.100712528-015-9101-x

Haight, M., Quan-Haase, A., & Corbett, B. A. (2014). Revisiting the digital divide in Canada: The impact of demographic factors on access to the Internet, level of online activity, and social networking site usage. *Information, Communication & Society, 17*(4), 503–519. doi:10.1080/1369118x.2014.891633

Ladson-Billings, G. (1995). Toward a theory of culturally relevant pedagogy. *American educational research journal*, 32(3), 465-491.

Reid, A. J., & Correa, E. (2021). Keep me connected: No cost solutions for access to remote instruction. In L. Kyei-Blankson, J. Blankson, and E. Ntuli (Eds.) *Handbook of research on inequities in online education during global crises.* (pp. 224-239). IGI

Reisdorf, B. C., Yankelevich, A., & Triwibowo, W. (2020). Laptop or bust: How lack of technology affects student achievement. *American Behavioral Scientist, 64*(7), 927.

Sturm, M. and Pinsent-Johnson, C. (2020). Canada's digital divide: A spotlight on the differences in online connection, activity and benefits. New Language Solutions. https://learnit2teach.ca/wpnew/what-is-the-digital-divide-and-what-does-it-mean-for-our-learners/

Thune, J., & Warner, M. (2019). How congress can ease Americans' $1.5 trillion student debt, Time. https://time.com/5662626/student-loans-repayment/

United Nations Educational, Scientific and Cultural Organization. (2019). What are open educational resources (OERs)? https://en.unesco.org/themes/building-knowledge-societies/oer

Van Dijk, J. (2020). *The digital divide*. Polity Press.

Winitzky-Stephens, J. R. & Pickavance, J. (2017). Open educational resources and student course outcomes: A multilevel analysis. *The International Review of Research in Open and Distributed Learning, 18*(4). Advance online publication. doi:10.19173/irrodl.v18i4.3118

Contact email: ecorrea1@csub.edu