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Atolls, Islands, and Archipelagos: The California OER Council and the New Landscape for Open Education in California

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Abstract

California's three public higher education systems (University of California, California State University, the California Community College System) enroll nearly 3 million undergraduate students and employ almost 100 thousand faculty. In 2012, the California State Legislature directed the three systems to create an online library of open educational resources to encourage the use of free or affordable textbooks and other materials throughout California's public higher education system. Composed of faculty representatives from each of the three systems, the California Open Educational Resources Council (CAOERC) was formed and charged in January, 2014, with collecting, peer-reviewing, helping to curate, publicizing, and cultivating the adoption of these open educational resources. As we end the first phase of this massive effort, our paper will: 1) outline what we've learned about scale and collaboration among California's three distinct higher education systems; 2) present the results of CAOERC's ongoing research (via surveys and focus groups) about open textbook use and adoption; 3) briefly discuss issues of OER sustainability in the context of cooperation among state, university, and non-profit sectors.

Key words: OER, sustainability, OER research, California, university, open textbooks

Introduction

California public higher education's three systems—or segments—enroll nearly 3 million undergraduate students and employ almost 100,000 faculty. Together, the University of California (UC), the California State University (CSU), and the California Community College (CCC) systems span 140 campuses and account for a total budget of $40 billion dollars. Nationally, California public higher education is roughly double the size—in terms of student enrollment—of its closest peers in Texas, Florida, and New York. California's community colleges account for one in five of all U.S. community college students (California Community Colleges Chancellor's Office, 2015). In broader terms, California's undergraduate student body is twice as large as that of our neighbor, Canada (Universities Canada, n.d.), a third larger than France's tertiary education sector and comparable to the total student enrollment in all German universities (Eurostat, n.d.). Together, the three California segments conferred 322,000 undergraduate degrees and certificates in 2013–14. In addition to sheer size, public universities and colleges in California represent one of the most diverse—racially, ethnically, and economically—student bodies in the nation: Latinos account for one-third of CSU's undergraduates, while the state's community colleges harbor an even more diverse, predominantly working-class student body (Bay Area Council Economic Institute, n.d.). Over the past half-century, the growth and development of public higher education in California has outstripped even the lofty ambitions enshrined in the state's Master Plan for Higher Education, crafted and signed into law in 1960.

Lately, however, California public higher education has experienced significant strain. State budget shortfalls caused by the latest recession exacerbated a deeper, secular trend of underfunding and plunged California's tertiary system into its worst financial crisis since the Great Depression. In

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2011–12, the state cut a fifth of the CSU budget ($650 million), and the UC system lost $750 million in state funding (California State University, n.d.). “I’d be lying,” declared Timothy White, then chancellor of UC Riverside and soon to become chancellor of the entire CSU system, “if I said what we offer students hasn’t been changed and there hasn’t been a degradation of the learning environment” (Medina, 2012). College and university administrators turned to tuition hikes to make up for cuts to state funding: over the ten-year period from 2004 to 2014, tuition rates at UC and CSU nearly doubled (Pickoff-White, 2014). As the state shifted higher education funding to students and their families, already struggling with recession-induced unemployment, growing debt, and an imploding housing market, the California public higher education system was rapidly swept into the “affordability crisis” that has come to define U.S. higher education over the past decade (Heller, 2014; Delta Cost Project, 2012).

This was the immediate context, then, for passage of California Senate Bills 1052 and SB1053 (Steinberg) in 2012, legislation that aimed to reduce the “skyrocket[ing]” costs of attending California’s public colleges and universities through provision of open textbooks (California State Senate, 2012a, 2012b). SB 1052 established both the California Open Educational Resources Council (CAOERC)—composed of three faculty members from each of California’s three higher education segments—and SB 1053 established the California Digital Open Source Library (COOL4ED), a statewide online repository for Open Educational Resources (OERs). The CAOERC was charged with locating, reviewing, and curating a collection of open textbooks for the 50 most highly-enrolled courses across the UC, CSU, and CCC systems. The Council’s work was overseen by a joint committee of the academic senates of each system (ICAS). SB 1052 also dedicated $5 million to support the effort for three years. This budget was supplemented by grants (secured by the CSU administration) from the Hewlett and Gates foundations. The Council first met in January, 2013, and subsequently convened—in person or via the web—once every two weeks for the next three years.

A full documentary report of the Council’s activities is publically available. As the report testifies, the enabling legislation and CAOERC’s work represent a major step forward for the OER movement within California. Since 2013, the Council has: determined the 50 most highly-enrolled courses across the three systems, identified 160 open textbooks suitable for these courses, solicited more than 450 open textbook reviews based on a rigorous peer-review system, curated our collection, produced case studies, conducted surveys of OER awareness and use among CSU, CCC, and UC faculty and students, and launched other investigations into open textbook adoption and use. Based on our experience as members of CAOERC, this paper focuses on three areas of possible interest to others in the OER movement: scale and complexity; our preliminary findings on open textbook adoption and use; and, finally, sustainability. By exploring these issues, we hope to offer a map for similar, massive OER initiatives and to invite others to help us chart the next leg of our journey to contribute to a global open knowledge ecosystem.

Scale, complexity, and collaboration

Typically, terms like scale and “scalability” circumscribe thinking about size and growth to a relation between inputs and outputs. Borrowed from the world of software development, “scaling up” has become a term-of-art in contemporary business lingo, for instance, because it promises that incremental inputs will result in exponential, rather than linear, outputs (Fundable, 2014). Since its creation under the 1960 Master Plan, California public higher education has indeed educated students and produced degrees on a huge scale. At the same time, each of the three segments described by the Master Plan has developed particular, indigenous curricula, cultures, and faculty roles. In other words, the distance between inputs and outputs—the black box of

scalability—conceals a dense, rich world of institutional complexity. Despite the simpler, implicit logic of scale in SB 1052, where the investment of resources in an administrative structure like CAOERC produces massive OER adoption, one of the Council's first major tasks was to recognize, understand, and bridge the differences among three distinct higher educational systems.

At the curricular level, student transfer between the three systems, especially from community colleges to the four-year universities of CSU and UC, has been a fundamental principle of California public higher education. Responding to state legislation in 2006 and hoping to improve transfers among segments by articulating curricula, California community colleges began developing a C-ID [Course Identification Numbering System], a common numbering system to identify similar courses across the three systems. In its quest to find the 50 most highly-enrolled courses, the CAOERC quickly discovered that maps don't always match the territory. For example, accounting is widely taught in the CCC system and fairly common in the CSU, though often under different guises. However, accounting courses and curricula are largely absent within the UC system. Even where common courses could be identified across the three systems, particular classes may not roost in the same curricular location. A lower division music appreciation course in the CCC or UC might reside in the upper division requirements for music majors at the CSU. While these disjunctures complicated the mandates in the state legislation, they also complicated the selection and evaluation of appropriate open textbooks.

The Council also confronted different professional cultures spawned by the differing missions of the three systems. Faculty roles vary among the UC, CSU, and CCC, and the faculty workload mix of teaching and scholarly activity is segment-dependent. Teaching is the exclusive professional work at community colleges; scholarship is the primary professional distinction within the UC. In our experience, this familiar hierarchy between, to borrow Burton R. Clark's terms, "discipline-focused" and "institution-centered" professional identities (Clark, 1987), profoundly affects the "scalability" of OER: CCC and CSU faculty who define themselves primarily as "teachers" rather than "scholars" tend to be more engaged with OER. The complexities of academic labor generate further differences. As state funding has declined, all three systems have increasingly turned to contingent faculty (Lambert & Reese, 2015; Strope 2015; Asimov, 2011). Within the CCC and CSU systems, this means that much classroom teaching is now done by part-time or contractual faculty. Within the UC, the teaching of lower division courses depends on graduate student labor. In either case, looser and more variable ties between academic workforce and institutions challenge traditional routes of communication and coordination. Widespread OER adoption within California public higher education will require that we cultivate new networks of influence and dissemination adequate to the increasingly fragmented landscape of academic employment and professional identity.

Different governance structures pose another challenge to massive efforts like the CAOERC's. With 113 colleges distributed across 72 local districts, California's community college system is more decentralized than the CSU or UC. The role of a central administration appears to be stronger in the CSU than in either the UC or CCC. More centralized structures may facilitate easier outreach and communication, and this feature may explain CSU's role in securing outside grants to supplement state monies and its key role in administrative support for the Council. On the other hand, the decentralized and more autonomous governance structures found in the community college and UC systems may foster stronger institutional identities, making OER adoption and use a more valued mark of local distinction. Several California community colleges and districts, for instance, can boast distinctive and active OER initiatives that predate SB 1052 and the CAOERC. These include the OER Center for California sponsored by the Foothill-De Anza Community College District as well as robust campus OER programs at College of the Canyons, Santa Ana College, Foothill College and elsewhere (Foothill College, 2010). Different governance structures also shape the particular

ways that each segment communicates internally, and these different pathways entail different ways of transmitting messages—in the form of surveys, solicitations for reviewers, outreach materials—from an intersegmental body like the CAOERC to local departments and faculty. This diversity has added an additional layer of careful, informed consultation with all stakeholders to the CAOERC's agenda for OER diffusion.

These are only a few examples of the complexities that have confronted our ambition to launch and scale up OER use within California public higher education. In a sense, locating and curating open textbooks has been a relatively smooth process. The differences among and within the three segments have however posed significant challenges—of communication, coordination, and participation. Much of the Council's primary time has been spent recognizing, understanding, and engaging with these differences. However, this experience underscores the importance of faculty or stakeholders as the drivers of massive OER efforts. Drawing on the institutional expertise and tacit knowledge of its nine faculty members, the Council drew and redrew maps of the variable network of people, policies, and local practices that connected inputs (legislation, money, and materials) to outputs (OER adoption). In addition, this experience has shifted the Council's thinking about OER, from a focus on production to a focus on consumption (or prosumption), from OER collection to OER community, and from OER as artifact to OER as process. Rather than accepting California's complex higher education landscape as a barrier, the Council now aims to leverage local cultures and communities to cultivate a statewide infrastructure of people, programs, and platforms for OER use.

Research and knowledge

The research projects that were pursued by the CAOERC seek to understand factors related to the adoption of open textbooks specific to the faculty and students of the state of California. These research activities included a survey on faculty awareness, perceptions, and willingness to use and create open educational resources, a series of focus groups with faculty and students principally aimed at understanding the impact of different media (electronic versus print) on the use of open textbooks, and a pilot project seeking to ascertain workload, performance, usability, and policy-related factors resulting from the adoption of open material in our universities.

1230 faculty members answered our survey, which was distributed among faculty across the 3 segments in a nonrandomized fashion. The participating faculty represented a wide variety of disciplines, from science, technology, engineering, and math (STEM disciplines) to liberal arts disciplines like the social sciences and the humanities. From the total number of responses, 20.6% of respondents had never heard of open textbooks, 64.7% had never been exposed to OERs, and only 13.5% had used an open textbook or parts of one (Figure 1).

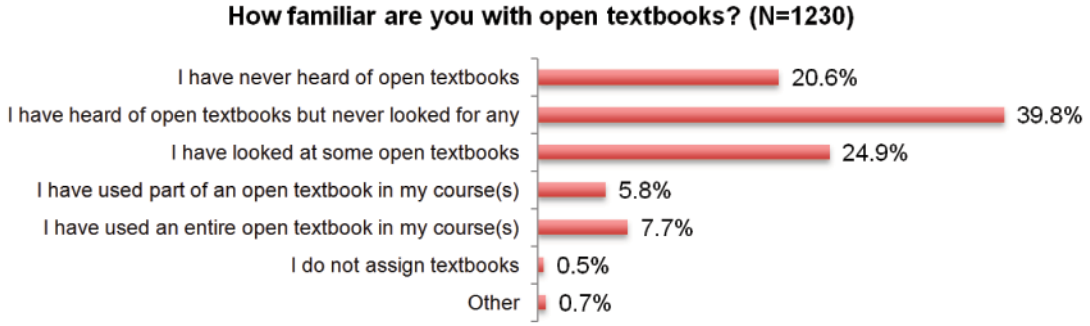

Figure 1: Familiarity with open textbooks

Figure 1 offers a cross-sectional snapshot describing the diffusion of open textbooks in California's higher education. Despite the large volume of open material available in repositories like MERLOT at the time of the survey, most of the respondents rely on instructional materials that are not open. About 60% of the faculty sampled has had no direct exposure to open textbooks, and their understanding of these resources is not shaped by direct experiences. Answers to this question also indicate that the remaining responses could be shaped by the information about open textbooks that was included in the survey itself.

The survey asked faculty about the impact of 9 different factors in the possible adoption of open textbooks for their courses (Figure 2). The most important factors among respondents were: academic quality, pertinence of the content to the objectives of the course, and currency of information; these factors are directly related to the open educational resources. Nonetheless, the amount of effort needed to find, review, and select open textbooks, was considered important or very important by 68% of the faculty. These types of faculty workload-related factors were explored further in the pilot program.

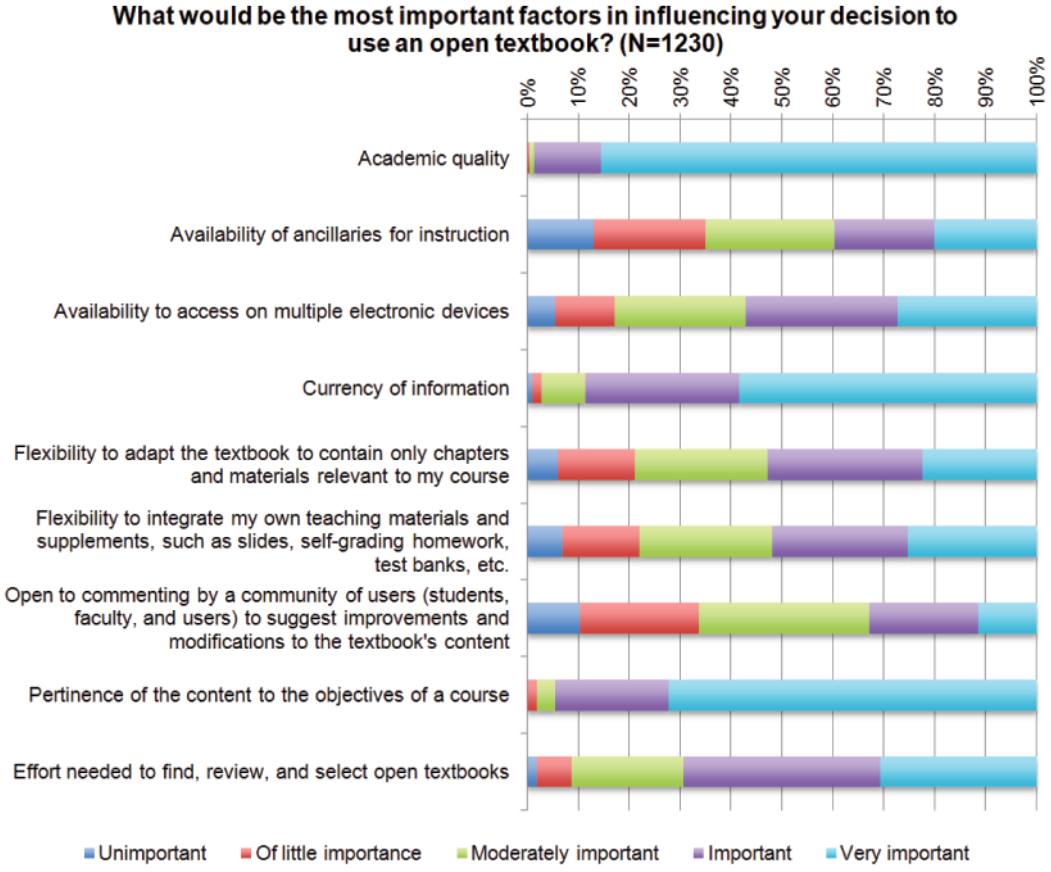

Figure 2: Factors for using open textbooks

Approximately, 58% of faculty surveyed indicated that the availability to access an open textbook on multiple electronic devices was important or very important. This specific factor, pertaining mostly to the experiencing of the digital content, is further explored in the focus groups research. Additionally, the survey asked faculty about their likelihood of adopting an open textbook, or parts of an open textbook, for their courses. Approximately 73% of the respondents stated that it was likely or very

likely (Figure 3). This datum contrasts the 64.7% of respondents who indicated a lack of direct exposure.

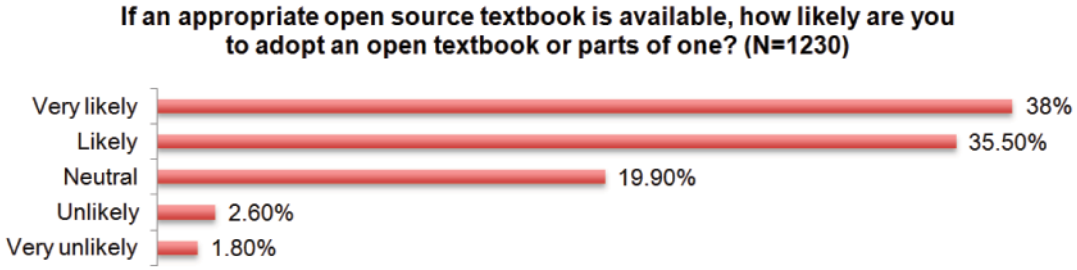

Figure 3: Open textbook adoption likelihood

Considering that the faculty surveyed have not had exposure to OERs, the high likelihood of open textbook adoption could be explained by an awareness of the price inflation of commercial textbooks in the United States has had in the last 3 decades.[1] This rationale is supported by the next set of responses in the survey, which pertained to the factors that would influence faculty members to make self-created instructional materials open (Figure 4). Approximately 88% of the respondents indicated that a desire to reduce costs to students is important or very important as a main driver to making their publications open. 53.2% of the respondents stated that a negative impact to their universities bookstores, which normally offer commercial textbooks to students, is unimportant or of little importance.

Among the factors cited to make self-authored instructional material open, more than 75% of the faculty surveyed stated that support from the administration, the availability of technical support, and the assurance that the publication would be professionally edited were important or very important.

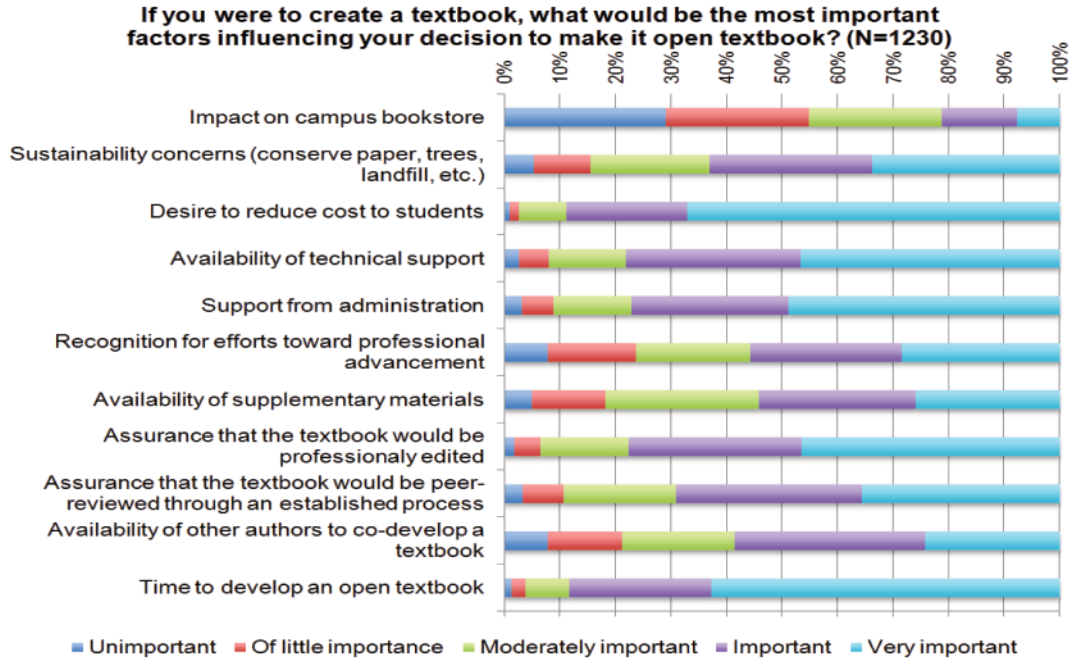

Figure 4: Factors for creating open textbooks

Current OER movements around the world are fostered by the generalized use of computers and the Internet. A digital publication can be easily duplicated and distributed at mass scales at negligible costs. Nonetheless, the experiencing of instructional materials is different when these are in digital form than when they are in print form. A literature review of electronic books (ebooks) studies from 2006 to 2011 found differences between ebooks and print publications, stating that electronic books are mostly used as information databases since the medium is appropriate for finding "relevant information that will support an argument in a research paper" (Staiger, 2012). One of the major conclusions of this study is that the use of ebooks "seem[s] to entail the dissolution of the idea of book as a rhetorical unit [. . .] dematerializing the book and making its wholeness invisible and intangible". Ebooks were found to be inadequate for longer periods of time reading (fatigue due to eye-straining) and difficult to use due to navigational problems derived from a lack of physicality. In an electronic book study performed at the University of Kansas, more than 60% of faculty and students in STEM disciplines preferred print books to ebooks (Waters, Roach, Emde, McEathron & Russell, 2014). Some of the factors cited for this preference are the difficulty of reading from a screen, difficulty annotating and highlighting, and inability to flip pages or to download the digital publications. This study also found it more probable that participants read a whole book on a tablet device than on a laptop/desktop computer. While Staiger's literature review found that there were no significant differences in use among different disciplines, the University of Kansas study found differences in the use of electronic textbooks just among STEM disciplines. Another study (Daniel & Woody, 2012) found that students take longer times reading in electronic format than in print format.

The literature review regarding the use of ebooks for educational purposes indicates that while digital formats allow for endless duplication and distribution of educational resources, the digital format per se may not be appropriate for the processes of teaching and learning in all situations.

The focus groups that the Council conducted sought to verify if the literature review reflected the experiences of faculty and students in the three California higher education segments were having. Three focus groups were conducted: One with faculty experienced in the use of open educational resources, one with faculty without open educational resources experiences, and one with students. Our results reflect the findings in the literature review and can be divided into the 3 overall categories: 1) The role of digital media and information literacy in facilitating the use of electronic books, 2) the varied use of textbooks by different professors in different subjects, and 3) convenience factors and the permanency of digital publications.

We found evidence in the focus groups that open textbooks in electronic format are not as appropriate for deep reading, or reading for long periods of time, than print publications. There were stated differences between reading electronic books and using electronic books for studying purposes. Reading a book in a linear fashion is not the same as using a textbook in a non-linear fashion for the purpose of studying. Electronic textbooks provide means to annotate and highlight content just as print publications do. Nonetheless, the ways in which annotations and highlighting take place in digital publications, and the ways in which the annotations and highlighted text are retrieved later on, could vary significantly from one application to another. On the other hand, in the case of print books, writing and highlighting content happens in fairly standardized way. Our findings indicate that knowledge about how to operate an electronic reading application could facilitate and improve the use of digital publications. However, as Woody, Daniel and Baker (2010) found, previous use of electronic books is not necessarily correlated with a preference for this format. Differences in use were also reported when it comes to the repagination that takes place in electronic books when the size of the font is altered. For example, if a professor refers to a specific page in an electronic publication, this page would not be the same if students opted to alter the layout of the

content. As is stated by Muir & Hawes (2013) in "The case for e-Book literacy," our findings indicate that training faculty and students on how to appropriately use reading applications would improve their educational experiences.

The focus groups also provided evidence of the many different uses of textbooks in instructional environments; not only differences in use were mentioned based on discipline, as Waters et al. (2014) found, but also different uses of a textbook were based on instructors teaching styles. From our results, similarly to Staiger's (2012) findings, it appears that in the sciences the ability to search within a digital publication is more important than in other disciplines. In some instances, textbooks are used to retrieve very specific content rather than to gain in-depth knowledge. In regards to instructor-based differences, a textbook could be used as the main means to acquire content knowledge in a course, but it could also be used only for its end of chapter exercises. As previously noted, reading is different than studying from an electronic textbook. While reading is mostly a linear endeavor, studying is often a non-linear activity in which students flip back and forth quickly from one "page" or unit of content to another.

The focus groups also related that convenience factors were important for the use of electronic textbooks instead of print publications. For example, instead of carrying several physical books, it is possible to load them all onto a single electronic reading device. Also, without explaining why print textbooks were any different, the ability to access their ebooks 24/7 was mentioned as important convenience factor. Students however expressed frustration at not being able to keep a copy of the textbook they used in a course, which sometimes happened due to technological changes or a lack of access due to digital rights management.

The pilot project is still in progress and the conclusion of this third research effort is not available for publication yet. The pilot project was designed to provide insights specific to the adoption of open textbooks in California's universities and colleges. For example, even though the CAOERC conducted a rigorous peer evaluation of the publications in COOL4ED, their quality might still be verified once more by their actual successful implementation in a course. In student performance-related matters, it is necessary to understand not only how the use of textbooks takes place, but also if this use leads to the attainment of the same learning objectives. Furthermore, while changing a textbook for a course could be beneficial for students, it is a labor-intensive process for the instructor. The pilot project seeks to understand how difficult it is for instructors to implement open textbooks under their current workload. This would help to assess whether the implementation of OERs requires investments in faculty development programs. Along the same lines, the pilot project seeks to understand if individual campuses policies could interfere, or aid, in the implementation of OERs.

Sustainability

As the CAOERC approaches the sunset of its enabling legislation and funding, Council members have gradually confronted the "Field of Dreams" problem: now that we have created a repository of peer-reviewed open textbooks, garnered new knowledge about OER, and established rudimentary education and outreach programs, can California's OER effort thrive without direct State and foundation funding? As part of an initiative to increase the use of open textbooks, the CAOERC's benchmarks for OER sustainability include: maintaining the currency of our open textbook collection, ensuring the curricular and pedagogical relevance of open textbooks, and broadening faculty awareness of and participation in the OER process. The recognition of sustainability as a critical issue is widely shared across the OER movement, and the fate of previous episodes in the history

of open education (from the "Open Admissions" movement of the 60s and 70s to "learning objects" and MOOCs) warrants this concern.

A variety of models for OER sustainability have been proposed over the past decade, most notably by Stephen Downes (2007) and Dholakia, King and Baraniuk (2006). These models focus on funding the production side of OER, and the emerging gold standard for OER sustainability appears to be the "Wikipedia" or "community" model, in which OER users "fund" projects by donating materials, time, and money (Hylen, 2006; Friesen, 2009). These discussions are important because they underscore the difference between price and cost; open textbooks may be free to students and faculty, but behind every free textbook lays a frequently invisible economy of labor and resources (Jones, 2015). Additionally, even the "community" model may underestimate, for instance, the elaborate governance and technical structures underlying the simplest Wikipedia page and overestimate the autonomy of Wikipedia and other "crowdsourced" platforms from wider social and economic realities (Selwyn, 2014; Taylor 2014). In any case, while these various options may help to guide OER projects through the quandary of funding, they won't help us to avoid the "Field of Dreams" problem. If the "battle for open" has been won, as Martin Weller (2014) argues, it has largely been won in terms of producing OER; but if winning doesn't "feel like victory," to continue the tagline for Weller's recent monograph, this is because OER production is only half the battle.

To phrase this problem in one set of familiar OER terms: of the five R's (retain copyright, reuse, revise, remix, and redistribute) that define openness (Wiley, 2014), production-centered approaches to sustainability tend to focus on the provision of open-licensed artifacts (the first R) and defer the question of whether or how these artifacts are taken up in practice (the remaining R's). From our perspective, the critical issue in OER sustainability is now less about supplying open textbooks than about empowering faculty and students to use these artifacts in order to make and share new knowledge, adapt learning to local contexts, and produce "creative readers" (Emerson, 1837). This shift from artifacts to relations and from objects to uses was also, for instance, a persistent theme of OpenEd 2015 (Bali, 2015). ("I don't want to be part of a movement that is focused on replacing static, over-priced textbooks with static, free textbooks," as Robin DeRosa blogged from the conference (DeRosa, 2015).) And, it has become a major focus of the European Commission's recent OER efforts (ExplOERer, n.d.). There are many models for this exploitation of openness—including "edupunk" (Groom, 2008; Farrow, 2015), teacher as DJ (Clow, 2010) or "bricoleur" (Hanley, 2011), Mark Sample's "deformed humanities" (Sample, 2012), and others. Each of these entails different degrees of institutional and cultural change, ranging from new ways of thinking about teaching to rethinking textbooks as just "another service that the public expects" of higher education (Wiley, 2007), but each shares a focus on open-licensing as a protocol for integrating resources into educational practices. This dimension of sustainability, in other words, requires investing resources to build local communities of practice rather than just building and curating OER collections.

From our perspective, after three years of experience with a massive open textbook initiative, the sustainability of the Council's work depends on two fundamental shifts in thinking about the relation among OER materials, institutions, and resources. First, the enabling legislation behind the CAOERC envisioned an extremely compressed time frame of three years; however, like other deep educational changes, the authentic integration of OER materials and practices into curricula, courses, and classrooms will require a much longer period of time. Second, while the CAOERC's initial labors revolved around the provision of high-quality, accessible open textbooks, thanks to our experience we are now grappling with the question of how the value of OER results from *both* the provision of artifacts (like textbooks) *and* the nurture of an open education culture of people, practices, and values. Thus, as California's massive OER initiative moves into a new phase, these shifts are reflected in two new, primary projects: The creation of an OER Campus Ambassador program and

a new round of legislation (AB 798 Bonilla) that funds campus-based, faculty-driven OER initiatives. Both projects direct resources to the development of campus-based, faculty-driven OER activities; Campus Ambassadors will advocate, organize, and advise faculty in OER adoption, use, and re-use, while AB 798 Bonilla (California State Assembly, 2015) dedicates $3 million in state monies to fund campus-based, faculty-organized OER adoption programs. Both projects hope to address the sustainability issue by bolstering the more-neglected 4 R's (reuse, revise, remix, and redistribute), integrating openness into teaching and learning, and leveraging local cultures and communities to create a dispersed but statewide infrastructure of people, resources, and expertise.

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Notes

[1] While the price of goods and services doubled in 3 decades, the price of textbooks had a 6-fold price increase in the same period of time. http://www.bu.edu/today/2015/save-money-on-textbooks/

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