Recasting the Affordable Learning Conversation:
Considering Both Cost-Savings and Deeper Learning Opportunities

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Open Educational Resources (OER) continue to gain traction in higher education with cost-savings as the current dominant narrative encouraging expanded growth across the world. Affordability is a key characteristic of OER. Yet, the cost conversation alone does not articulate all the benefits of OER as a learning resource. Findings from our study examining the impact of OER adoption on teaching and learning suggest instructors saw the creation or adoption of OER as an opportunity to improve student learning.[1] While some instructors were primarily driven by cost-savings, the majority were motivated by pedagogical considerations aligned with a Deeper Learning framework.[2] In this contributed paper, we present Deeper Learning as a valuable theoretical framework to recast the OER conversation from one based primarily on cost-savings to a narrative of resource development and pedagogical opportunities that encourage 21st century skill development and transferable knowledge. Connecting a specific framework, such as Deeper Learning, to the OER conversation provides explicit student outcome goals that are important markers of student learning and career preparation.[3] Our goal is not to give a step-by-step guide or remove agency in the creation and curation of materials, but instead introduce a framework that incorporates specific learning outcomes and competencies to strive for during material development.

The Cost Conversation

Institutions report their respective OER initiatives are saving students millions of dollars per year (e.g., Kansas State University's savings of $5.5 million since 2013, University of Minnesota's $3.5 million since 2015, and The Ohio State University's $3 million since 2016). Federal and statewide grants support these OER initiatives in an attempt to address the exponential price increases in the textbook market over the past 40 years. While the overall cost trend illustrates a steep incline, average textbook cost has actually seen minute fluctuations the past few years as OER gains traction and publishers introduce new cost-cutting measures to keep their stronghold on course materials and resources (Figure 1).

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FIGURE 1
Consumer Price Index: College Textbooks (January 2006–2018)
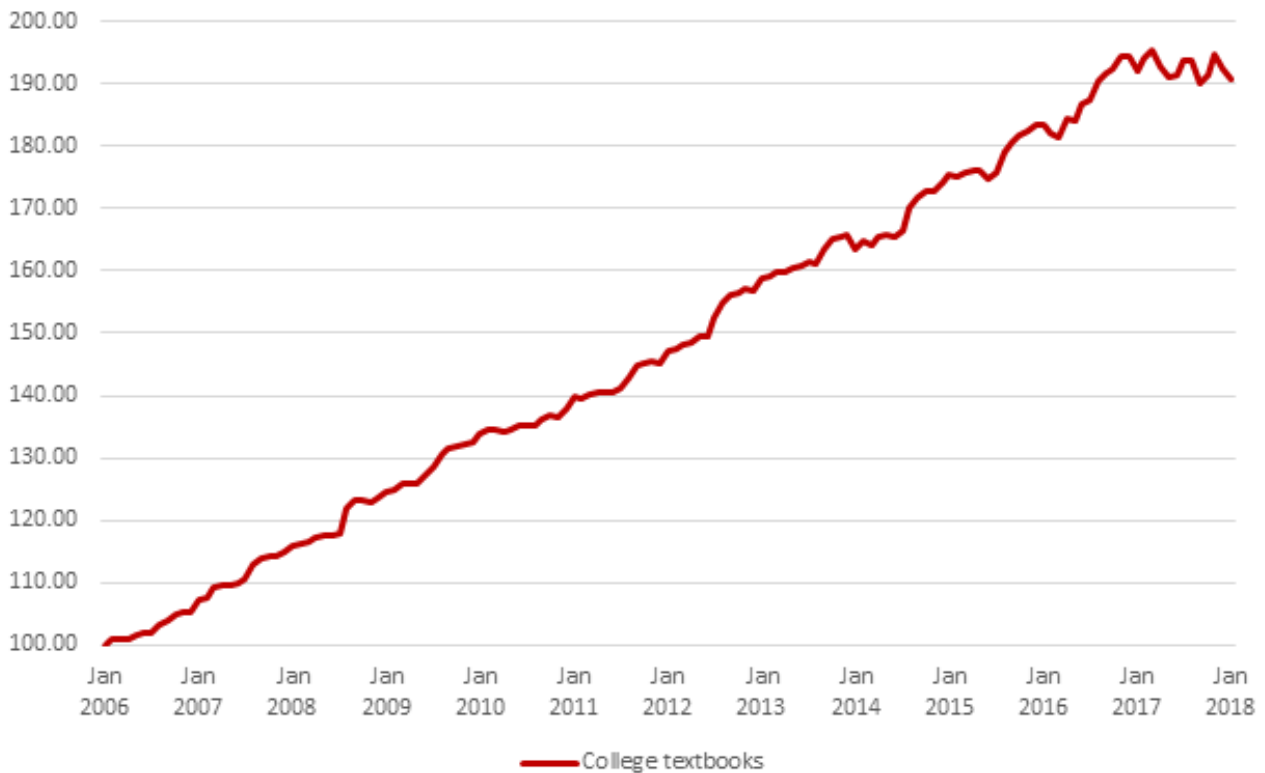
Source: U.S. Bureau of Labor Statistics

The National Association of College Stores reported the average spent on textbooks at a campus bookstore decreased from $576 to $484 from 2016-17 to 2017-18.[4] Students also increasingly report acquiring textbooks from online sources and peers to reduce the cost of course materials.[5] The expansion of lower priced e-textbooks reduces costs for students, but they are not without multiple challenges, including limited access, sharing restrictions, and additional one-time digital codes for supplemental materials. Inclusive Access (IA) models have also sprung up to address cost concerns with institutions signing contracts per course to ensure all students have access to e-textbooks the first day of class. With these contractual models, materials are cheaper for students through negotiated discounts between the institution and publisher. Although textbooks are still very expensive for students and require further policy considerations, publishers are introducing pricing measures in ways that may make the cost-savings argument of OER less compelling.

The argument for OER must expand to include benefits outside of dollars saved. OER advocates and researchers argue that solely focusing on cost-savings does not communicate the complete benefits of the open movement; David Wiley described this argument as a "cost trap" and likened the conversation to discussing email solely as a free alternative to stamps without discussing other benefits like the speed and ease of communication.[6] The open nature of materials and customizability supported by the 5Rs of the open movement[7] encourage a change in the design of course materials to include key content knowledge, academic skills, and learning competencies of Deeper Learning.

Pivoting to Student Learning

Courses that utilize OER tend to exhibit positive or no significant difference in academic outcomes compared to courses using traditional texts, suggesting they do not harm and potentially benefit student learning. Positive outcomes in courses that use OER include increases to final grades and lower "D", fail, or withdrawal (DFW) rates.[8] Colvard et al. also reported greater positive impacts for traditionally high-risk groups including Pell, part-time, and underrepresented minority students.[9] Studies reporting no significant differences between courses using OER and those using traditional textbooks suggest OER does not negatively impact student outcomes.[10] The student outcomes cited above show OER are potentially beneficial for learning. However, the referenced studies did not assess the type, quality, or implementation of OER; with variability one of the greatest assets of OER and its implementation, there is likely a spectrum of impact not yet explored.

Among the varying resources, quality, and implementations, research suggests students and faculty are generally pleased with the quality and experience of using OER.[11] Faculty also perceive higher student interest and engagement with OER materials, allowing instructors to increase the depth and breadth of content covered in the course or include additional educational activities in the same timeframe.[12] OER adoption also often comes with a change in teaching style and curriculum.[13] However, there is little research on specific pedagogical practices faculty employ when adopting OER in their classrooms.

Open Education Practices (OEP)[14] are often offered as talking points to expand the OER conversation from materials to utilization; Ehlers and Conole posited OEP provide instructors opportunities to enhance and innovate teaching and learning in educational settings.[15] However, the recommendations are often general and without specific skills or learning competencies associated with them. The lack of specificity in the literature on OEPs limits practical recommendations for classroom implementation, obscuring the conversation on developing purposeful curricular changes to enhance student learning.

Faculty seek additional support and resources when adopting OER materials.[16] A framework with specific academic skills and suggested learning outcomes, like Deeper Learning, can serve as a guide for the creation and implementation of OER. Deeper Learning supported OER can help develop the 21st century skills instructors and employers consider important for students' academic success, as well as their economic and civic development.[17]

Deeper Learning Defined

The Deeper Learning framework serves as a pedagogical conceptualization of the 21st century skills and transferable knowledge development critical for students' postsecondary professional and civic lives. The National Research Council defined Deeper Learning as "the process through which an individual becomes capable of taking what was learned in one situation and applying it to new situations."[18] The framework prioritizes three competency domains of interpersonal, intrapersonal, and cognitive skills. These domains are associated with higher-order thinking and learning as well as postsecondary and career readiness. The intrapersonal domain refers to a student's ability to self-regulate their learning and includes skills such as learning to learn and academic mindset, meaning that outside of the context where these skills are initially being taught, students are able to continue their academic discovery journeys and build on these skills. The interpersonal domain focuses on interactions with others including the consumption, processing, and sharing of knowledge. Skills related to the interpersonal domain include effective communication and collaboration—the goal is to move learning from an individual to a societal benefit. Lastly, the cognitive domain pertains to the individual's internal processing of information and includes the skills of applying content knowledge, problem solving and critical thinking.

	TABLE 1	
	Deeper Learning Domains and Competencies	
Domains and Competencies	**Definitions**	**Examples**
Cognitive		
Mastering core academic content	Students understand content in their academic discipline and can apply it to real world situations beyond the discipline.	Incorporate real world examples and assignments with relevance to discipline-specific academic and professional goals.
Thinking critically and solving complex problems	Students can apply analytic, reasoning, and inquiry tools to creatively solve real world problems.	Create materials that weave questions throughout the text and build upon each other, rather than saving exercises for the end of a chapter.
Interpersonal		
Working collaboratively	Students cooperate with others to solve problems and address challenges.	Include real world scenarios with assigned roles that encourage students to work together to solve problems.
Communicate effectively	Students can clearly organize and present information.	Develop materials in platforms (e.g., Pressbooks) that provide opportunities for students to communicate their learning by contributing to and revising OERs.
Intrapersonal		
Learn how to learn	Students regulate and direct their learning.	Incorporate goal-setting and reflection exercises throughout the text; Use bold text and headers to help students sort through and identify the most relevant material.
Develop academic mindsets	Students see themselves as members of an academic community and believe in their ability to succeed; they see their work as having value.	Curate or create a variety of resources, including text, podcasts, videos, and visuals; design assessments that allow students to demonstrate their learning in a variety of personalized ways.

Deeper Impact with Deeper Learning

Deeper Learning, particularly when paired with affordable materials such as OER, can help to expand access to 21st century skill development in a wide variety of educational settings. Unfortunately, many students arrive to postsecondary institutions without the appropriate content knowledge or competencies to be academically successful.[19] Farrington asserts that schools serving low-income and racial minority students often fail to provide opportunities to develop deeper learning competencies.[20] Rote, low-level instruction reinforces students' feelings of inadequacy in these systems, resulting in failure to attain certain skills.[21] Higher education instructors can address their students' academic challenges and anxieties through Deeper Learning, however most default to the traditional "knowledge transmission" style of teaching,[22] mirroring the rote instruction common in under-resourced high schools. Instructors who teach from the knowledge transition perspective tend to limit classroom discussion and collaboration, and instead lean on lecturing and multiple-choice testing methods.[23] Highly motivated students may still engage with the topic while less motivated students or students needing additional support in the classroom may fall behind. Instructors who rely on lecturing may do so because they fear more learner-centric approaches will involve time-consuming preparation and a willingness to risk trying new

methods of instruction.[24] This is due in part to a lack of guidance on how to implement more effective materials and teaching strategies. Worryingly, this reliance on low-level instruction has the potential to reinforce inequities when considering employers utilize education as a signal of ability and productivity in job candidates.[25] However, the development of skills related to Deeper Learning require instructors to engage students in the classroom, encouraging active learning that can increase student success.[26] Meeting this goal requires a change in practices and not just materials.[27] Deeper Learning offers instructors the guidance needed to implement newer, more dynamic instructional approaches and center on learning facilitation instead of rote instruction.

Educators are utilizing Deeper Learning as a pedagogical approach to address these concerns with Deeper Learning initiatives in the K-12 setting. Vander Ark and Schneider aimed to break the myth that the Deeper Learning framework is only for suburban, honor students, or even for native English speakers.[28] After profiling 20 Deeper Learning-aligned schools, they found that students in urban and/or low-income community schools were reaching the Deeper Learning outcomes at a similar rate as suburban schools and honor programs when the curriculum applied a Deeper Learning framework. In fact, Hoffman argues lower income students might benefit even more from Deeper Learning in the area of career readiness because these students may not have access to the types of hands-on training a wealthier student might have when it comes to acquiring internship experiences.[29] Furthermore, low-income students are spending time working to support themselves and their families at jobs that may not support skill development in the same way.[30] Deeper Learning can serve as an equitable solution for schools to facilitate those 21st century skills outcomes.

While much of the Deeper Learning research aims to address academic disengagement in high school,[31] the Deeper Learning framework holds promise for higher education as well. Career readiness is an urgent priority for America's students[32] and employers have indicated their learning priorities for higher education align with the six Deeper Learning competencies.[33] Research has typically found that higher education has positive long-term impacts on many Deeper Learning competencies, including critical thinking, mastering core academic content, and cognitive development.[34] Collaborative learning is also an enabling factor in promoting college students' voices in their own education.[35] However, other research has also indicated students may not be cultivating these competencies at the level necessary for success after college,[36] especially the modes of critical thinking related to the Deeper Learning framework.[37] Deeper Learning is primarily discussed as a pedagogical practice with less of a focus on the materials or resources used in the classroom. We believe utilizing the Deeper Learning framework to create and adopt OER has the potential to ease and increase integration of these integral competencies and practices across higher education.

Pairing OER and Deeper Learning

The Hewlett Foundation's education program strategy categorizes Deeper Learning and OER under the same goal of providing students quality learning opportunities.[38] The benefits of using Deeper Learning as a framework with OER are reciprocal and multi-faceted. OER allows faculty to utilize and customize materials in the classroom according to the "5Rs."[39] This flexibility in resources supports a change in practice to better fit faculty objectives.[40] Not only does Deeper Learning provide a framework to create OER focused on structured learning competencies, but digital learning strategies such as OER improve the benefits of Deeper Learning.

Vander Ark and Schneider completed a comprehensive review of schools who nominated themselves as strongly aligned with a Deeper Learning framework; after reviewing the national network of 20 schools, they found that digital learning enhances the benefits of Deeper Learning, specifically new strategies and forms of delivery.[41] The themes of personalization, simulation, access, acceleration, and options arose as areas in which digital learning enhanced Deeper Learning in classrooms; OER creation and adoption is one such strategy to

employ Deeper Learning, as it provides the opportunity to personalize learning and deliver curricula in new ways. For example, a social science instructor in our study developed a multimedia lecture series, recording video lectures from a variety of academic and industry experts that could provide varied perspectives on the complex issues of her course. This expanded her traditional course materials into Deeper Learning-aligned OER that served as a direct connection to and discipline-specific examples and professionals, providing insight about career requirements and skills needed to be successful after college.

Deeper Learning-aligned OER should not only focus on the mastery of course-specific content, but also on the application of disciplinary knowledge to extracurricular, "real-world" scenarios central to the Deeper Learning framework. Fortunately, faculty who adopt OER often do so with a goal of improving student learning and critical thinking skills.[42] To better meet these goals, faculty and other educators can use Deeper Learning competencies, and the themes that enhance Deeper Learning, to construct or curate OER. The goal is to create and curate materials that help incorporate 21st century skill development in the classroom; aligned materials can help facilitate Deeper Learning competency development regardless of in-class practice. We provide some example Deeper Learning-aligned components that can be considered when creating or curating OER in Table 1.

Why Start with Librarians?

Librarians are key stakeholders and experts in the conversations about OER creation and adoption,[43] as well as the open movement more generally. The leadership of librarians in conversations related to OER, as well as open access (OA) more broadly, is visible at the institutional, national, and international levels.

At a practical level, librarians often promote the ethos of open and recruit instructors to participate in grants or programs designed to support or incentivize OER adoption and other affordable learning materials. It can be difficult to find ways to appeal to instructors who do not feel as passionately about the ethos of open or whose textbooks are not wildly expensive, because adopting OER and affordable materials is challenging and requires a lot of time and effort on the part of the instructor. We believe the Deeper Learning framework provides an opportunity to appeal to instructors who may not be passionate about the open movement or are not as concerned about the cost of their materials but are concerned about the quality of student learning. The Deeper Learning framework provides librarians with an opportunity to reframe conversations about OER and affordability away from cost-savings and towards student learning goals.

In addition, librarians are often charged with supporting the development of students' information literacy. While this term—information literacy—may or may not resonate with instructors,[44] it does address many instructors' desire to improve their students' critical thinking, communication, and problem-solving skills, particularly within a disciplinary setting. The Deeper Learning framework addresses all of these desires and aligns well with the dispositions and knowledge practices related to information literacy, thus providing librarians with new ways to approach the integration of information literacy into the formal academic curriculum. The Deeper Learning framework can be used to begin conversations about instructors' goals for student learning and how those can be achieved in conjunction with *The Framework for Information Literacy for Higher Education*. Both frameworks are beneficial to help instructors develop or revise learning outcomes for their courses and/or their assignments, and librarians can use their expertise to help instructors select or create materials and activities based on those learning outcomes.

Finally, we believe librarians are well positioned to help instructors unlock the full power of Deeper Learning-aligned OER through discussions of implementation, including OEP. In addition to expertise related to OERs and information literacy, librarians often serve as the campus leaders in digital scholarship and are familiar with the digital tools and platforms that may be necessary to implement Deeper Learning-aligned OER

in the classroom. Moreover, librarians commonly provide support about copyright and intellectual property concerns to adopting instructors. This expertise also extends to the adoption of OEP, as students may be creating content that will be shared outside the physical or digital classroom and both instructors and students may need to consider the intellectual property concerns that arise with this kind of a shift. The combination of expertise libraries typically have can help instructors move from simply adopting OER to completely redesigning their assignments, such that students are engaged and empowered as knowledge creators, while also developing critical Deeper Learning competencies that will help them to be successful in college and beyond. In addition, this may help to breakdown existing organizational silos within libraries as colleagues think about the intersections of their work and what that means for the teaching and learning environment at their institution.

Next Steps/A Call to Action

Deeper Learning provides a student outcomes-based framework to pivot and lead the conversation of OER development from cost-savings to learning. A framework does not guarantee quality but helps to clarify and provide structure for OER creation and adoption. In addition, the Deeper Learning framework provides domains and competencies that instructors can use to develop learning outcomes for their assignments, outcomes that focus both on the content knowledge they want students to develop throughout the course, as well as ways of thinking that will benefit students in the course and beyond. The first step is the creation of Deeper Learning-aligned OER followed by a focus on practice.

The relationship between Deeper Learning, affordable learning (including OER), and implementation inspires a multitude of implications for practice. Many institutions are likely at a point in their affordable learning and OER initiatives to pause and reflect about their progress and potential next steps. Many of us have likely had success in recruiting and supporting intrinsically motivated faculty and may be wondering how to appeal to other instructors. We encourage affordable learning partners to examine their messaging related to affordable learning materials and OER to determine how visible a role pedagogical transformation and student learning each have in recruitment efforts. Conversations with adopters about classroom implications will be helpful in considering a reframing of the promotion of affordable learning and OER.

We encourage institutions and affordable learning stakeholders to consider the foundation OER adoption provides for more in-depth pedagogical transformation, one that more fully embraces the power of Deeper Learning-aligned materials. Our research suggests the adoption of OER can spark pedagogical transformation that aligns with Deeper Learning competencies. Different methods of implementation have the potential to engage students in critical thinking, problem solving, new modes of communication, and experience with emerging technologies through integration with course content. Deeper Learning-aligned practices should require students to practice and demonstrate the interpersonal, intrapersonal, and cognitive competencies related to the Deeper Learning framework.

One possible approach is integrating Deeper Learning competencies into more focused OEP. At present, organizations like ISKME provide helpful examples of Deeper Learning-aligned OEP,[45] yet little attention is paid to the materials being used. Open materials created with Deeper Learning competencies in mind can be paired with OEP, or used independently, to promote student learning. Inviting students into the OER creation process is a way that educators can address Deeper Learning competencies with OEP. For example, in a STEM course, a professor would receive emails from students about errors in his self-authored open materials. He realized these unintentional errors provided an opportunity for intentional learning.[46] An intentional exercise in which students are part of the creation or revision process of classroom materials, or even publicly available material like Wiki articles, enhances the opportunity to reach Deeper Learning competencies such as mastering academic

content, thinking critically and learning how to learn.

In addition to applying content knowledge from the course to their projects, these kinds of assignments require students to think critically about their audience(s) and understand effective methods of communicating with those audience(s). Students can work collaboratively, as individual projects typically are part of a bigger project, such as a book or a website. Because of this, students must also learn how to provide, receive, and use constructive criticism from both their instructor and their peers. Finally, many students will need to solve problems that arise in a more complex project environment, as well as troubleshooting technical issues due to the digital nature of many of these kinds of projects. These activities ultimately contribute to 21st century skill development.

We encourage institutions and affordable learning stakeholders to consider how they may use the Deeper Learning framework to continue to engage the early adopters of affordable learning materials and OER to continue enhancing student learning. The adoption and implementation of affordable materials, including OER, are challenging and time consuming, and faculty report a lack of support and training around OER,[47] potentially limiting adoption and impactful integration into their teaching. Strategies and design guidelines may help facilitate OER creation and adoption.[48] Given the lack of specificity in how to use OER in the classroom and the need for professional development, there exists an opportunity to adopt a framework with specific learning outcomes like Deeper Learning.

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