



Using Affordable Course Materials: Instructors' Motivations, Approaches, and Outcomes

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abstract: Based on 30 interviews with instructors who implemented affordable materials in their courses at a large research university, this study explored their motivations for using such resources, the processes they employed, and the extent to which the new course materials influenced teaching methods and perceived learning outcomes. Results suggest that most instructors were motivated by both student cost savings and hoped-for improvements in teaching and learning. Instructors' choices—such as the decision to adopt an existing textbook in full or to curate a collection of disparate materials—were strongly influenced by their perception of how well available resources aligned with their own teaching and learning goals. In general, instructors felt student learning slightly improved after they put the materials into use, but the extent of improvement seemed to vary across the approaches to implementation. Librarians can leverage these results to help motivate and support the selection and implementation of affordable materials.

Introduction

College and university librarians are key stakeholders and experts in institutional, national, and international conversations regarding the affordability of course materials. In addition to their historical role of procuring and providing licensed materials to students at no cost, libraries have begun to support or incentivize the use of open educational resources (OER) in college classrooms.¹ However, after the first round of enthusiastic volunteer instructors have implemented affordable content, it may be challenging to engage additional instructors—and to convert their initial interest into actual use.

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This study uses in-depth interview data to explore instructors' motivations for using affordable content, as well as their approaches to implementation.² Most instructors created or curated their own materials; only a few adopted existing OER textbooks in

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full. Results suggest that instructors were inspired to choose affordable materials based on the twin desires to save students money and to improve teaching and learning. Their implementation approaches—such as the choice to adopt an available textbook in full or to select and organize a group of diverse resources—were strongly influenced by their perception of how well the materials aligned

with their own teaching and learning goals. The use of affordable materials did not substantially alter teaching techniques; however, instructors believed student learning slightly improved, with some variation in the extent of improvement across approaches to implementation. The paper's conclusion discusses how librarians can leverage these findings to help motivate use of affordable materials, identify approaches to implementation that best align with each instructor's key objectives, and support the chosen approach.

To provide the reader with background on the creation and implementation of affordable course materials, this article first describes the types of resources that qualify as “affordable course materials” and how they are created and used. Next, it reviews research regarding the teaching- and learning-related motivations for choosing these materials.

What Are “Affordable Course Materials”?

Full-time students at public four-year colleges are estimated to budget \$1,240 on textbooks and course supplies, or approximately 12 percent of in-state tuition.³ To improve affordability, policy makers, institutions, and individual instructors increasingly look to affordable course materials, including licensed library materials, textbooks and other open educational resources (OER), and the emerging category of deeply discounted inclusive access (IA) commercial textbooks.

Licensed Library Materials

Historically, college libraries have supported student access to affordable materials by including key course materials and occasionally copies of popular commercial textbooks in circulating or reserve collections.⁴ However, given that libraries can offer only a limited number of copies, this approach typically serves a small proportion of the students needing a particular textbook or resource—particularly as many reserve items can be borrowed for only a short time or are marked for in-library use. Another traditional approach to affordability is the “curated course packet,” in which the instructor packages a selection of printed textbook chapters, journal articles, or other resources, sometimes with the assistance of a librarian. While students still pay copyright fees to obtain the packet, they can avoid purchasing textbooks from which they need only a chapter or



two. With the advent of digital library materials, instructors can now curate a selection of library-held or openly licensed digital materials that are completely free for students to access, download, and annotate, and can easily be integrated into the course management system. However, it is unknown how many instructors integrate digital library materials into their courses for affordability reasons, and no current research indicates how or why they do so.

OER Textbooks

OER textbooks are typically created by college professors and are produced as openly licensed e-texts in digital platforms that allow instructors and students from around the world to freely customize, annotate, and share materials.⁵ Instructors who use OER textbooks appreciate the ability to reorder, add, or delete content as appropriate to their own student population, teaching style, and desired learning outcomes.⁶ Students also have positive attitudes toward OER, rating the materials equally or more positively than traditional printed textbooks.⁷

Many instructors are reluctant, however, to adopt OER textbooks due to concerns regarding quality, curation effort, and course management.⁸ In particular, OER textbooks typically lack companion materials and tools, such as automatically graded homework assignments, quizzes, and exams, which instructors of large lecture-style classes often feel they need to manage their courses effectively. Accordingly, while penetration of OER into college classrooms has increased, it remains relatively low; a recent survey estimated 23 percent of instructors use OER as supplemental resources and 14 percent adopt OER as required components of their courses.⁹

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Inclusive Access

To reduce commercial textbook costs, some college libraries and consortia have partnered with publishers to introduce inclusive access (IA) models, in which students pay for a commercial digital textbook as part of their tuition or course fees, and the institution pays a deeply discounted bulk price.¹⁰ Many stakeholders are skeptical of inclusive access, however. In a 2019 national survey, 64 percent of faculty respondents felt that “publishers providing a discount to the list price of a textbook, in return for a commitment from the school to an inclusive access program” was either “generally not acceptable” or “totally unacceptable.”¹¹ Others are concerned that inclusive access models might enforce problematic usage restrictions; lure colleges into an agreement using steep discounts, but later increase prices; reduce competition and crowd out smaller but higher-quality competitors; and limit student and faculty freedom of choice.¹² Although the inclusive access model is quite new, an estimated 7 percent of instructors already use it.¹³



Why Use Affordable Materials?

Studies of the use of affordable materials have primarily focused on OER textbooks.¹⁴ As one might expect, the most commonly cited motivation for OER usage is saving students money—which in turn may improve course outcomes by ensuring that all students have access to the required textbook and by reducing the extent to which financial stress distracts from their studies.¹⁵ In addition to lowering costs, some instructors seem interested in the potential of OER to improve teaching or learning.¹⁶ For example, in open-ended comments captured from two different surveys of college teachers, some respondents mentioned the potential pedagogical benefits of customizing OER to the needs of their own course objectives or students.¹⁷

The pedagogical impact of OER is unclear. Instructor surveys suggest that most respondents change instructional practice to at least some extent when implementing OER, but most also see little or no alteration in their students' behaviors or performance. A minority of respondents report changes in their students' engagement and performance when implementing OER—but it is unclear why they observe such differences while most others do not.¹⁸ This lack of clarity regarding how to achieve improved student outcomes with OER may discourage instructors from experimenting with it at all, particularly given the time and technological learning curve required for implementation.¹⁹

In general, instructors may be motivated to adopt OER by a belief that they will improve student learning and performance—whether due to cost savings, curricular or pedagogical improvement, or some combination of those factors. Indeed, quantitative research suggests that OER use may, on average, have a mildly positive impact on student course completion and grades.²⁰ This average effect may be highly variable across types of OER design or pedagogical implementation, but quantitative studies have no access to detailed information on these points and thus cannot determine when OER usage is meaningful to student learning and performance, and when it is not.

Overall, past studies have treated “affordable course materials” as equivalent to “OER” and as a monolithic category that should have a similar influence on teaching and learning regardless of the type of material adopted, the kind of instructor who chooses it, or the motivations for doing so. To extend and deepen the understanding of affordable materials, this study examines a university-wide affordability project that leveraged library materials, OER, and other freely available digital materials. The study uses in-depth interview data to explore the following research questions:

- Research question 1: Why were instructors motivated to adopt affordable materials?
- Research question 2: How and why did instructors select and implement different types of affordable materials?
- Research question 3: Did affordable materials influence teaching and learning? Were there differences across types of materials in terms of their quality, their influence on teaching, or their perceived impact on learning?

The remainder of this paper outlines the university-wide affordability project that forms the foundation of the study; explains the qualitative analysis framework (including two emergent frameworks of “pedagogical alignment” and “Deeper Learning”); and presents and discusses the study's results and implications.



A University-Wide Affordability Project

In 2016, a multicampus state university launched a grant program to support instructors in replacing their traditional textbooks with affordable digital learning materials, including OER and library materials, but not inclusive access materials.²¹ The program was a joint effort of the university's Learning Technology unit and the University Libraries. Although the grant program was largely framed as an affordability initiative, it also sought to encourage instructor innovation and improve student learning.

To apply for the program, instructors submitted a short application including a description of their course, their initial ideas regarding potential ways to leverage affordable content to replace current materials, an estimated budget for the work, and projected student savings. Submissions were refined with program staff, resulting in a final proposal reviewed by a selection committee. Most instructors who submitted proposals were accepted into the program. Each attended a kickoff workshop that provided key information and resources (for example, copyright and fair-use guidelines), and then worked for approximately eight months with a Learning Technology project manager who helped create a plan, tasks, and timelines for each project. As part of this process, the instructor determined whether the project would consist of: (1) adopting an existing open textbook, (2) writing an original openly licensed textbook, or (3) curating a suite of digital library materials or other freely available digital resources. The project manager connected instructors with relevant experts and resources, including subject-area librarians; instructional design personnel, workshops, or communities; and copyright librarians. Many of these experts and resources were guided by the principle of "backward design"—the concept that instructors should first identify their desired learning outcomes, and then design assessments and related materials to support these outcomes—although experts may not have always discussed this principle with instructors in an explicit way.²²

Over the program's first two years, 30 instructors used affordable materials for 32 courses and worked with colleagues to implement these materials across 72 class sections. All but three instructors were employed full time by the institution. Courses spanned a wide variety of disciplines and comprised 17 lower-division, 12 upper-division, and 1 graduate-level course; social science courses had the highest concentration of lower-division courses. Courses were typically taught by a full-time instructor (often the faculty member who received the grant and led the project), although some were taught by part-time adjunct faculty or graduate students. Overall, the first two cohorts saved students more than \$2.6 million between autumn 2016 and spring 2018.

Methods

The researchers invited all 30 grantees in the first two cohorts to participate in an interview study.²³ In cases in which grantee materials were adopted by multiple instructors uninvolved in the grant, the researchers also invited one or two of those additional adopters to participate. Two sets of grantees worked together in pairs to design their materials and were interviewed as pairs. Overall, the research team interviewed 25 grantee instructors, 6 non-grantee instructors, and 1 coordinator of a team of grantee



and non-grantee instructors, across a total of 30 interview sessions. Of the 30 interviews, 15 focused on social science courses, 9 on STEM, and 6 on humanities. Twenty-five interviews discussed courses at the university's selective flagship campus, while five focused on courses at open-enrollment regional campuses.

Interviews occurred soon after the first semester of project implementation, during the semester break or subsequent semester. Interviewees described their learning goals for the course, why and how they selected affordable materials, how they implemented the new materials to support their goals, and the extent to which they felt the new materials affected student learning. To elicit a structured set of information on project implementation, the interview also included an embedded survey. Interviewees began by providing background on the affordability project and project goals for approximately the first third of the interview.

Next, interviewees filled out the survey and discussed their responses in detail with the interviewer. If instructors indicated that alterations in teaching and learning occurred, interviewers probed for specific examples of how class activities, assessments, student behaviors, or student outcomes changed. The embedded survey included 23 questions (see the Appendix for survey items) on the materials' quality, integration into the course, and perceived impacts on teaching and learning. Items regarding the quality of resources and changes in learning were rated from 1 to 5 (1 = "Much worse/less than before," 3 = "About the same," and 5 = "Much better/more than before"). The integration of materials into the course was scored from 1 to 5 (1 = "Never," 3 = "Sometimes," and 5 = "Every time"). Changes in teaching were rated from 1 to 3 (1 = "No change," 2 = "Some change," 3 = "Quite a bit of change"). The instructional coordinator interviewee did not fill out the survey because although she helped lead the affordability project, she did not personally teach the course, resulting in 29 total surveys. Interviews were audiotaped and transcribed verbatim by a professional transcription service. The accuracy of each transcription was then confirmed.

Analytic Framework and Data Analysis

A basic qualitative approach with an underlying constructivist epistemology was used for this study. This methodology is appropriate when the researcher is interested in how people interpret experience, construct their own understanding and knowledge of the world, and attribute meaning to experience.²⁴ This section first describes why and how the researchers classified respondents into project types, then how the researchers developed and applied the coding scheme for motivations, and finally how they triangulated across the transcript coding data and the interview-embedded survey data.

Defining Project Types

The projects varied widely in their approach. To understand the scope and variety of projects, the research team worked to classify projects into general types. The first attempt at classification relied on nomenclature used by the Learning Technology project manager and grantees: (1) materials adopted wholesale, or with minor modifications, from an existing open-source textbook; (2) materials newly created by the instructor; or (3) materials curated by the instructor. Researchers used interviewee descriptions of

each project and a review of actual course materials to sort projects into classifications. However, several projects did not fit neatly into these categories, and researchers thus created an additional classification representing (4) an amalgam of curated and newly created content.

Creating a Coding Framework for Instructor Motivations

To explore motivations to use affordable materials, the researchers applied inductive analysis to identify recurring patterns and themes across interview transcripts.²⁵ The researchers first skimmed the parts of each transcript dealing with reasons for creating or using affordable materials. These reasons fell obviously and clearly into two major categories: cost-related motivations and teaching-related or learning-related reasons.²⁶ The researchers remained open to emergent patterns and newly uncovered understandings as they collaboratively developed and refined a qualitative coding scheme through close readings and discussions of the transcripts. From this process, two subthemes emerged under teaching or learning: pedagogical alignment and Deeper Learning.

Pedagogical Alignment

As noted earlier, most grantees likely knew of Grant Wiggins and Jay McTighe's principle of "backward design," either implicitly or explicitly, through discussions with their project manager or another university instructional designer.²⁷ Under the backward design process, instructors first identify student performance goals and related learning outcomes, then decide how those learning outcomes can be appropriately assessed, and finally design learning activities and materials that will support students to succeed with those assessments. Underlying the concept of backward design is a broader concept of alignment: that different components of a course should not be designed separately, but rather should be created to complement and support other components. While none of our grantees mentioned the framework of backward design—nor explicitly connected all three links in the backward chain from outcomes to assessments to materials—most did mention their desire for stronger alignment between their course materials and other course components. The researchers coded these instances as pedagogical alignment, with three subcodes indicating whether the instructor was trying to align the course materials with student needs or desires, objectives for learning, teaching approaches, or a combination of those.

Deeper Learning

The Hewlett Foundation's Deeper Learning framework defines a set of higher-order thinking skills students need to be competitive and successful in the twenty-first century. These skills are organized into three domains: cognitive, intrapersonal, and interpersonal.²⁸ None of the research participants mentioned Deeper Learning per se. Most did, however, express the desire to strengthen student skills that happen to be part of the Deeper Learning framework, including cognitive skills (processing of information, such as applying content knowledge, problem-solving, and critical thinking), intrapersonal skills (self-regulation of learning, including skills such as "learning to learn" and academic mindset), and interpersonal skills (interactions with others, including effective



communication of content knowledge, collaboration, and the shift of learning from an individual benefit to a societal one). Several members of the research team utilized the Deeper Learning framework to develop a coding scheme, while also remaining open to emergent patterns and newly uncovered understandings.²⁹ The researchers coded instructors' mentions of these skills as Deeper Learning, with subcodes indicating whether the comment discussed cognitive, intrapersonal, or interpersonal skills.

Triangulating the Data

In addition to the motivation codes of cost, pedagogical alignment, Deeper Learning, and their subcodes, the researchers created codes to tag and characterize instructors' descriptions of the project process, challenges, eventual product quality, and related changes in teaching and learning. To further understand perceptions regarding product quality, implementation in the classroom, and student outcomes, the researchers also examined grantees' interview-embedded survey ratings, including comparing the individuals' ratings to their qualitative explanation, and calculating averages and standard deviations for each survey item across respondents. Finally, after defining the project types, the researchers descriptively compared interviewees' patterns of qualitative codes, as well as their associated survey ratings, across types.

Trustworthiness

When conducting basic qualitative research, methodologists suggest using criteria for rigor that cut across methodological approaches.³⁰ The researchers provided rich, thick description using instructors' quotations, which allow the reader to evaluate the transferability of the findings.³¹ Further, by presenting the data in the participants' own words, the researchers permit the reader to determine the validity of the analysis.³² Additionally, the use of two data sources—the interview and the embedded survey—allowed for “methods triangulation” to overcome any biases that might have arisen from the use of a single method. The presence of multiple researchers heightened trustworthiness by encouraging “analyst triangulation” to balance any one-sidedness resulting from a single observer.³³ Together, these strategies support the credibility of the results.

Results

The first “Results” section addresses research question 1—“Why were instructors motivated to adopt affordable materials?”—by providing an overview of interviewees' motivations in terms of both cost reduction and teaching and learning improvement. The second section deals with research question 2—“How and why did instructors select and implement different types of affordable materials?”—by discussing the four project types, why instructors gravitated to each type, and implementation processes and challenges. These two sections draw exclusively on the qualitative coding of interview transcripts, without reference to survey data. A third section addresses research question 3—“Did affordable materials influence teaching and learning? Were there differences across types of materials in terms of their quality, their influence on teaching, or their perceived impact on learning?”—by capturing similarities and differences between

the project types in terms of product quality, modifications in teaching, and perceived changes in student learning. This section incorporates both the interview-embedded survey data and instructors' related qualitative explanations.

Instructor Motivations

Across almost all interviews (27 of 30), instructors cited cost savings as a motivator. Their explanations were straightforward and expressed similarly. The following quotation from a humanities instructor is representative: "I knew from students of my previous classes that some of them just didn't buy the textbook because it was just too expensive. But unfortunately, there was no good print alternative." Given the homogeneity across instructors in their discussion of cost motivations, this analysis does not delve further into this theme. In an equally large number of interviews (27/30), instructors cited reasons related to teaching and learning, including pedagogical alignment (25/30), Deeper Learning (26/30), or both (24/30). However, instructors discussed these reasons in varied ways, as explained in more detail in the following sections.

Pedagogical Alignment

In terms of pedagogical alignment, most instructors were concerned with whether the material was appropriately aligned with students' level and style of learning (23/30 interviews). For example, one pair

of instructors who worked collaboratively on developing a new textbook noted that the previous book was not designed for undergraduate students: "I think for our students we're specifically trying to write to a student population, so the language is a little different, the tone is different." In about half

the interviews (17/30), instructors also cited the need to better align their materials with particular learning objectives. For example, a social science instructor explained that the state had defined a set of key learning objectives for her introductory course, but available commercial textbooks did not sufficiently address those statewide objectives. Another department had worked to develop more consistency in instructors' learning objectives and approaches regarding student writing, and these instructors noted that their collaboratively created affordable materials could be more readily aligned to the department's evolving needs and objectives:

One of the things we did early on was to meet with other instructors in [our STEM] program . . . and make sure there was continuity in how we were talking about technical communication from that first-year [program] experience through the senior Capstone. We saw what we created in this e-textbook [as] something that could bridge all those components.

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Finally, some instructors sought better alignment to their own preferred teaching styles (12/30). For example, an instructor who wanted to “flip” the classroom, having learners study new content at home and using class time for discussions, felt students might not complete traditional textbook readings prior to class but might watch videos instead.

Deeper Learning

Respondents touched on each of the three domains of Deeper Learning but most commonly discussed issues related to cognitive learning, followed by interpersonal learning and then intrapersonal learning. In terms of the cognitive domain, instructors in most interviews (22/30) said they wanted students to better understand and apply key content knowledge. For example, a social science instructor described her desire to make the textbook more practical: “Unfortunately, some of the textbooks that we’ve used have almost emphasized too much of the theoretical aspect of the concepts that we’ve discussed, and not necessarily more the practical. These are the transferable skills that you need to get out of this.”

Within the interpersonal domain, instructors in about half the interviews (18/30) said they wanted students to improve communication or collaboration skills. For example, a STEM instructor desired materials that would help students “engage with issues of audience and purpose and some rhetorical strategies” in their writing, and a humanities instructor wanted resources that would support more equality within collaborative groups: “[This course has] always emphasized collaboration, and people are required to work in teams. But [with the traditional textbook] there used to be more of a disparity between the abilities of members of a team, based on their prior experience before coming into the course.”

The Deeper Learning framework’s intrapersonal domain focuses on whether independent learners have the skills and mindset to take control of their own learning. Some-

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what less than half the interviews (13/30) spoke to this point. For example, some instructors reported that students often uncritically regard commercial textbooks as a fount of truth. The instructors hoped that providing a variety of sources would help students learn how to approach questions rather than seek one correct answer. Others indicated that learners needed to improve their ability to synthesize information. A humanities instructor explained that moving away from a single textbook is “modeling the idea that you gather information from a variety of sources, and you can apply each of those sources to this idea that you are formulating.” Several instructors hoped to improve their

students’ self-directed learning or to help them develop an academic mindset that was less focused on grades and more interested in knowledge itself.

Across interviews that discussed motivations related to Deeper Learning, 6 emphasized only one domain of Deeper Learning, 13 mentioned two, and 7 referred to all three. Motivations regarding Deeper Learning and pedagogical alignment often (but not always) overlapped. As noted in the section “Instructor Motivations,” 24 of 30 interviews included both themes, but some instructors discussed one theme without reference to the other. For example, one social science instructor explained that traditional textbooks cannot integrate the most current information. She noted, “The students really seemed to appreciate talking about things that are very timely and relevant to them.” This instructor did not, however, draw connections to Deeper Learning competencies.

Selection and Implementation of the Project Types

This section addresses our second research question by discussing the four project types, why instructors gravitated to each type, and implementation processes and challenges. Overall, instructors would most likely assemble a selection of materials (either through the “Curate” or “Amalgam” approach) and least likely adopt an existing OER textbook in full. The section begins by describing interviewees’ perspective on the “Adopt” approach ($n = 4$), followed by “Curate” ($n = 10$), “Create” ($n = 7$), and “Amalgam” ($n = 9$).

“Adopt” Projects: Taking Up an Existing OER Textbook

Across the 30 interviews, 4 instructors adopted an existing openly licensed textbook with little or no modification. They seemed most motivated by cost reductions (among the four, all emphasized savings to students, three touched on Deeper Learning, and only one mentioned pedagogical alignment). All four taught introductory social science courses, which tended to have larger class sizes. Perhaps as a consequence, when these instructors searched OER repositories, they found one or more openly licensed digital textbooks that seemed well-aligned with their students’ level and the course’s learning objectives. The OER texts were similar in approach and style to a commercial textbook, although they provided fewer ancillary materials (such as slide decks or test banks).

Given that well-aligned and no-cost materials were readily available and seemed easy to implement, these instructors did not strongly consider creating or curating their own materials. They characterized the switch to an OER textbook as relatively straightforward, similar to the time and effort required for any new textbook, and all finished their project on time. However, “Adopt” instructors seemed unenthusiastic about the quality of their new materials. One said, “I think some students are still not loving the book. They don’t think the book is extremely helpful, but I think the relative proportion of those students is smaller . . . Fewer people hate it. Fewer people complain. Fewer people say that it was not helpful.” Looking forward, “Adopt” instructors appreciated the potential for revising or remixing the openly licensed materials. As another explained, “If you want to use a different section or a different—all you have to do is change your hyperlink and voilà, it’s all magically changed. I think there’s some great opportunity. I think it will ultimately make it easier to adjust your teaching as you tweak it every semester, even though the first time was kind of painful.”



"Create" Projects: Developing Materials from Scratch

Ten interviews were conducted with instructors across a wide variety of disciplines who created their own materials from scratch, which they then published under an open license. These instructors were motivated not only by economics (9 of 10 discussed cost savings) but also by teaching and learning considerations (all 10 interviews talked about

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both pedagogical alignment and Deeper Learning). Like most other respondents, "Create" instructors felt available commercial textbooks were not a good fit for their course. However, they believed the best—or only—way to address these problems was to develop original materials. They were excited about the opportunity to have complete authorial control, which they hoped would ensure materials would match their own teaching style and

learning goals. For example, one social science instructor wrote an original e-book to "write the text in the same way I taught in class. I think that reduces a lot of the confusion students sometimes have."

"Create" instructors wrote an original digital textbook, produced original videos or interactive Web-based content, or created some combination thereof. To lighten the workload, several used grant funds to hire undergraduates, graduate students, or professional editors to coauthor or edit materials. Even so, the burden of time and effort was unexpectedly heavy. Most "Create" instructors committed to an eight-month timeline for development but were not done with their materials by the intended date of implementation. One STEM instructor mostly completed his materials but feared they were insufficient; accordingly, he recommended students use a traditional textbook as a supplement. "Create" instructors were somewhat frustrated that their workload continued through the semester as they continued to supplement or revise their materials; however, they also appreciated the ability to make continuous updates to their materials in response to student questions or current events. Even if new course materials did not yet fully meet their vision, all "Create" instructors expressed happiness with the first semester of implementation. As one STEM instructor explained: "There are some aspects that are covered more in depth in great ways, and there are other components that are not covered at all in the textbook—that are done through lecture or other ways—because there hasn't been the time to be able to actually get it into a form that would be acceptable to use in the textbook."

"Curate" Projects: Assembling Disparate Materials

Seven interviews focused on the "Curate" approach, which was implemented across six departments and seven courses. All "Curate" interviewees were full-time faculty who led the selection of materials. While one instructor was motivated solely by cost savings, the others discussed both pedagogical alignment and Deeper Learning motivations in depth. These instructors were particularly thoughtful in terms of considering and discussing

their students' goals and interests. They felt learners want more "modern" approaches to course materials and believed a curated approach would create the strongest alignment between student interests and key learning objectives. Although "Curate" instructors were no more likely than their peers to discuss Deeper Learning overall, they did seem particularly interested in the intrapersonal learning component (with 7 of 8 making relevant comments). They also described the potential of multiple information sources to push students toward a more reflective and self-directed learning mode.

"Curate" instructors drew materials from various existing sources, including digital open-source or library-held book chapters, freely available online films and lecture videos, and open access or library-held journal articles. For example, a STEM instructor wanted to offer her students a way to read about the subject that was "not dry and boring", and that would serve them well for a long time. She suggested, "It's really stinking useful for students to have read some journal articles as undergraduates. Particularly if any of them end up going on to graduate school, they've learned a really useful skill as part of that." Her redesigned course materials included several chapters from an inexpensive paperback textbook, supplemented with articles from scholarly and practitioner journals, videos, and other library or Web-based resources.

In terms of the "completeness" of materials at the beginning of the implementation semester, "Curate" materials fell between "Adopt" and "Create" materials: while several "Curate" instructors still wanted to improve some pieces, those "gaps" were not obvious to students. As one STEM instructor said, "There are a few things I think, still, we haven't found great resources for. I know there are books, like online books that the library doesn't have access to, that are perfect." "Curate" instructors seemed to view this ongoing process of curation as a feature rather than a flaw.

In general, "Curate" instructors were pleased with the relevance and currency of their materials; as a humanities instructor said, "The customized solution . . . suited my needs better than anything I could find on the shelf." On the other hand, most "Curate" interviewees noted the materials felt somewhat "ad hoc" or less coherent without the structure provided by a traditional textbook. As a STEM instructor said:

I think in retrospect I probably need to be more prepared to either write something to provide that connective tissue, or make sure I'm doing that in class. I think that's maybe one of the downsides of having articles instead of textbooks. They're all written by such different voices that the students, if they're not trained to do so, aren't seeing that connection, necessarily. And I felt, overall, like students were less comfortable with that material.

To fill in gaps, two "Curate" instructors relied on portions of textbooks or had students buy other books. In these cases, the research team debated whether the courses belonged in the "Amalgam" category. The team ultimately placed them in the "Curate" category because they did not intentionally create a connective structure, a consistently written narrative that provided context and connections among the resources.

"Amalgam" Projects: Curating Materials with a Connective Structure

Nine interviews focused on "Amalgam" materials, which were used across four departments, eight courses, and a variety of modalities.³⁴ Six interviews dealt with a single



social science department that adopted affordable materials as a strategic initiative and took a collaborative approach to materials development across three courses. Across these six “departmental initiative” interviewees, four worked at the selective flagship campus, were involved in the collaborative team effort, and tended to discuss all three motivations. Two others taught at regional campuses, were simply directed to use the new materials, and were primarily interested in cost issues. The remaining three interviewees taught in three different departments and designed their own materials for their courses. All three of these stand-alone interviewees were triply motivated by cost, pedagogical alignment, and Deeper Learning.

Like “Curate” instructors, “Amalgam” instructors wanted to identify a range of resources that were relevant, current, and engaging for their students. For example, a social science instructor worked to include “real-world examples, and they’re local examples, which I think makes it more interesting, or personal examples.” Instructors also endeavored to include more career-related content; as one departmental-initiative instructor explained, “The materials that we had lent [themselves] to a better understanding of connecting to speakers from agencies. So [professionals] who are already in practice and their agencies. And asking more questions about how they do their job, how do we apply this information.”

In contrast to “Curate” instructors, however, amalgamators anticipated the importance of a connective framework that would knit the resources together into a more coherent whole. For example, a social science instructor redesigned her course around a freely available Web-based tool and a series of videos with experts from the field. To weave these together, she added written material based on her old lectures. Similarly, a social science instructor created content to provide context for the materials she curated:

For the most part, it was like, “Okay, I want them to get this concept. Where is the best place for the materials?” And some places there would be an article, some place it would be something NIH [the National Institutes of Health] had produced . . . But I needed them to have a context for it, and some continuity because the style is different.

Under the departmental initiative, a committee of faculty collaborated to create the “Amalgam” materials for several courses. Their creation and implementation process was focused on aligning the curriculum between courses at different levels and allow-

The collaborative process engendered thoughtful conversations about teaching and learning, and how curated materials could support those goals.

ing students to “put theory into practice,” as one instructor said. The collaborative process engendered thoughtful conversations about teaching and learning, and how curated materials could support those goals. For example, one instructor shared:

Looking for resources, watching videos, reading things I would never have . . . it made us really rethink what we wanted in those courses. And maybe how we wanted to teach it. And so, I think it made us better instructors. Definitely. Because we

had to be at one with everything we found, and think about that ultimate goal of: How do we really engage with our students and get them to think critically and apply what we’re giving them? And are we finding the things that will get them to do that?

Yet even with the intentional selection and contextualization, a few “Amalgam” instructors felt the materials remained somewhat disjointed. One said she missed the “glue” of a textbook; another mentioned that students sometimes wondered where to focus their attention. She explained: “I think because there were different places they could get material from the textless [resources], you know: Were they going to look at all the links? Look at the embedded videos? Were they going to look at the lecture?”

Like “Curate” instructors, most amalgamators had to downshift expectations for certain pieces of their materials to finish on time. In general, however, amalgamating seemed to combine the organizational strengths of a traditional textbook with the flexibility, relevancy, and currency of the “Curate” approach. While instructors involved in their creation were excited about the “Amalgam” materials, the two who were directed to adopt them had no strong opinion; one volunteered that the new materials were not better or worse than the previously used book, just different. The other shared, “I didn’t feel like it was a huge difference in terms of what I was able to share with the students, because I think a lot of the content itself was very much the same.”

Process Issues

Across all four project types, the process of adopting, creating, or curating affordable materials took longer than anticipated, resulting in shifting plans for the final product. Instructors not only had to write, curate, or update texts, but also had to change the accompanying assignments and lectures—a time-consuming process even for adopters.

Navigating copyright issues was also time-intensive. ASTEM “Amalgam” instructor explained, “We also had to deal with copyright issues . . . but by the time we got the permission, and trying to get schedules together, and build it, we ran out of time.”

In general, many instructors felt they would not—or could not—have embarked upon and successfully completed their project on their own. As an “Amalgam” instructor in the social sciences said:

I would never have been able to do this on my own. I wouldn’t have had any of the resources to do it. I wouldn’t have had the kind of orientation to open educational resources that—I mean, I had sort of heard the term and that kind of thing. But the kind of training and support that the [project] team gave us, plus the ability to purchase some help with the [grant] money was—I couldn’t have done it without any of that.

In general, many instructors felt they would not—or could not—have embarked upon and successfully completed their project on their own.

Changes to Teaching and Learning

To capture similarities and differences between the project types in terms of product quality, changes to teaching, and perceived changes to student learning, this section examines the interview-embedded survey data and instructors’ related qualitative explanations.



Quality and Integration of Materials

Table 1 shows that instructors rated the quality of their new materials highly (close to a 4, or "Somewhat better than before") on almost every item. For example, they provided an average rating of 3.8 for "engaging and interesting writing" and 4.4 for "relevant content." Table 2 shows that instructors also felt the new course materials were more necessary to student learning (average rating of 3.9 for understanding material and 4.4 for succeeding on assessments), and they would now more likely incorporate mechanisms that required students to review the materials (average rating of 4.0). To explore potential differences between the project types, Tables 1 and 2 also provide a separate mean for each type. While small sample sizes make it unfeasible to confidently compare project types, both tables reinforce the impression that "Adopt" instructors were least enthusiastic about their new materials. For example, they rated two aspects of quality lower than before (visual quality and study aids, with an average rating of 2.5 for each) and would no more likely than before require students to review course materials (with an average rating of 3.0).

Changes to Teaching

During the interview, instructors provided a survey rating and an explanation of the extent to which the materials changed their teaching in terms of content coverage, proportion of time spent on activities, assessment issues, and preparation time. Some said their teaching did not change at all; for example, one part-time "Adopt" instructor recounted:

Switching to [the affordable material] this year, part of the reason why I didn't incorporate a lot of stuff from the textbook [into class activities] is because I didn't actually get the links to the chapters until like two weeks before the semester. I didn't really have a lot of time to be particularly thoughtful about reading through what was in there. I just skimmed it, and I was like, "Oh, yeah, this is good." I still treat it as, "Okay. This is what I'm teaching, and the textbook is a resource."

Others said their teaching changed considerably; for example, one full-time instructor who used the adopting approach had long been interested in integrating more active learning into her course and now did so by "dramatically" changing the format of recitations. Her previous commercial textbook supported online homework assignments and quizzes, and losing this resource made her rethink the use of class time:

Because I didn't have the ability to do these online homework assignments, I switched that assignment to a worksheet they would do in recitation. Recitations became this group problem-solving session where they would sit and work in small groups on the worksheet, work their way through the problem. My goal was that it would be an opportunity for students to explain to each other, and get up and show the class, and by the end of the class, they would all know how to solve the problem.

Table 3 shows that, on average, each aspect of teaching changed either "Not at all" (1) or "Some" (2) for almost every item and every project type. The only obvious outliers were a deeper coverage of topics among "Amalgam" instructors (with an average rating of 2.5, which instructors attributed to the use of primary sources as reading materials)

Table 1.

Instructor ratings of the quality of open educational resources (OER) materials by project type and overall, on a scale of 1 to 5

	Project type				
	“Adopt” M (SD) N = 4	“Create” M (SD) N = 10	“Curate” M (SD) N = 7	“Amalgam” M (SD) N = 8	Overall M (SD) N = 29
Good search capabilities	4.0 (1.4)	4.3 (0.8)	3.3 (1.1)	4.1 (0.6)	4.0 (1.0)
High-quality visuals	2.5 (0.6)	4.2 (0.9)	4.0 (1.3)	3.8 (1.2)	3.8 (1.1)
Engaging and interesting writing	3.3 (0.5)	4.0 (0.8)	3.6 (1.1)	4.1 (0.6)	3.8 (0.8)
Understandable and clear writing	3.0 (0.0)	4.2 (0.8)	3.3 (1.0)	4.1 (0.8)	3.8 (0.9)
Helpful and useful study aids	2.5 (1.3)	3.6 (1.0)	2.6 (1.4)	3.5 (1.3)	3.2 (1.3)
Relevant content	3.8 (1.0)	4.8 (0.6)	4.3 (0.8)	4.4 (0.9)	4.4 (0.8)
Current content	3.5 (1.3)	4.4 (0.8)	4.6 (0.5)	4.6 (0.5)	4.4 (0.8)
Average across items	3.2 (0.8)	4.2 (0.4)	3.7 (0.5)	4.1 (0.6)	3.9 (0.6)

and the time required to prepare for class among “Curate” instructors (with an average rating of 2.6). “Curate” instructors’ extensive preparation time seemed due to the lack of structure provided by a traditional textbook or “Amalgam”-style backbone; they thus found themselves filling in gaps throughout the semester. “Curate” instructors also tended to use current online resources (which may update content or change locations unexpectedly), requiring them to actively check and revise links.

Changes to Learning

On the interview-embedded survey, instructors indicated the extent to which the materials changed student learning in terms of engagement, participation, collaboration, depth or quality of learning, and performance, on a 1 to 5 scale. Several interviewees said learning did change but were reluctant to ascribe that shift to their materials, and thus opted to skip one or more items. Table 4 shows that, on average, instructors rated student learning either “About the same” (3) or “Somewhat better” (4) than before. While small sample sizes make it unfeasible to confidently compare between project types,



Table 2.

Instructor ratings of the integration of open educational resources (OER) materials by project type and overall, on a scale of 1 to 5

	Project type				
	"Adopt"	"Create"	"Curate"	"Amalgam"	Overall
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
	N = 4	N = 10	N = 7	N = 8	N = 29
Students required to review materials	3.0 (1.7)	4.3 (0.9)	3.9 (1.5)	4.0 (1.2)	4.0 (1.2)
Materials necessary to understand in-class material, lectures, or discussions	3.3 (1.3)	3.5 (1.0)	4.0 (1.0)	4.6 (0.8)	3.9 (1.0)
Materials necessary to do well on course assessments	4.0 (1.4)	4.4 (0.8)	4.4 (0.5)	4.5 (0.8)	4.4 (0.8)
Average across items	3.5 (1.3)	4.1 (0.7)	4.1 (0.8)	4.4 (0.8)	4.1 (0.9)

Table 4 suggests that "Adopt" instructors were least likely to believe positive change had occurred. They provided a relatively low rating of 3.3 across items and were the only group to rate any items at "About the same" or worse (a rating of 2.7 for "depth or quality of learning" and 3.0 for "performance on assessments"). In contrast, "Amalgam" instructors seemed most likely to believe positive change had occurred; they scored a relatively high rating of 3.8 across items (including an average rating of 4.3 for "depth or quality of learning").

Instructors who felt quality of participation, collaboration, or depth or quality of learning became "Somewhat better" or "Much better" discussed these changes in ways that resonate with the Deeper Learning framework. In terms of the cognitive domain,

... some instructors felt the materials helped students draw connections between academic content and real-world applications.

some instructors felt the materials helped students draw connections between academic content and real-world applications. As one "Create" instructor in social science said, her students "were able to see how everything related outside of the classroom. Because of all the examples that I included in the textbook,

Table 3.

Instructor perceptions of the changes to teaching by project type and overall, on a scale of 1 to 3

	Change to teaching				
	Project type				
	“Adopt” M (SD) N = 3	“Create” M (SD) N = 10	“Curate” M (SD) N = 7	“Amalgam” M (SD) N = 8	Overall M (SD) N = 28*
Breadth of coverage	1.8 (1.0)	2.0 (0.7)	2.0 (0.8)	1.9 (0.8)	1.9 (0.8)
Depth of coverage	1.5 (0.6)	2.2 (0.6)	1.7 (0.8)	2.5 (0.8)	2.1 (0.8)
Proportion of time spent on different activities	1.8 (1.0)	1.7 (0.8)	1.6 (0.8)	1.9 (0.9)	1.7 (0.8)
Number of assessments	1.5 (0.6)	1.4 (0.7)	1.4 (0.8)	1.4 (0.7)	1.4 (0.7)
Types of assessments	1.5 (1.0)	1.4 (0.5)	1.6 (0.8)	1.6 (0.7)	1.5 (0.7)
Nature of final/most important assessment	1.3 (0.5)	1.4 (0.7)	1.4 (0.8)	1.6 (0.7)	1.5 (0.7)
Time required to prepare	1.7 (0.6)	1.8 (0.8)	2.6 (0.5)	1.9 (0.8)	2.0 (0.8)
Time required to grade	1.0 (0.0)	1.1 (0.3)	1.3 (0.8)	1.4 (0.5)	1.2 (0.5)
Average across items	1.5 (0.5)	1.6 (0.4)	1.7 (0.4)	1.8 (0.4)	1.7 (0.4)

*All 29 respondents are included in this table for the items that they rated, but two were hesitant to rate all eight items. Ns in the column headers reflect the number of respondents who completed at least seven “Change in teaching” items and were thus included in the “Average across items” calculation.

because of all the popular sources that I included, because of the industry expert videos, they were able to see, "This is stuff that's actually important. This is stuff that people actually use." In terms of the intrapersonal domain, some "Curate" and "Amalgam" instructors felt the new materials helped students improve their critical thinking by forcing them to compare different sources. For example, an "Amalgam" instructor in the social sciences said,

Before, I wonder if they could have gotten through that course without really reading in depth, based on what our assignments were in the past. And I worry that from a critical thinking standpoint, we weren't asking them to do enough . . . We added this new source comparison assignment because we wanted something that made them take the concepts that they had been reading about, and then take a look at present-day events that were happening that were relevant, and really reflect on and consider that.



Table 4.

Instructor perceptions of the changes to student learning by project type and overall, on a scale of 1 to 5

Change to learning	"Adopt" M (SD) N = 3	"Create" M (SD) N = 9	"Curate" M (SD) N = 7	"Amalgam" M (SD) N = 7	Overall M (SD) N = 26*
Level of motivation and engagement	3.5 (0.6)	3.7 (0.5)	3.7 (0.5)	3.9 (0.7)	3.7 (0.5)
Quality of participation during class activities and discussions	3.7 (0.6)	3.7 (0.9)	3.6 (1.1)	3.9 (0.7)	3.7 (0.8)
Quality of collaboration with fellow students	3.7 (0.6)	3.7 (0.7)	3.9 (0.9)	3.7 (0.8)	3.7 (0.7)
Depth or quality of learning	2.7 (0.6)	3.6 (0.7)	3.4 (0.5)	4.3 (0.7)	3.6 (0.8)
Performance on assessments	3.0 (0.0)	3.7 (0.5)	3.5 (0.5)	3.4 (0.5)	3.5 (0.5)
Average across items	3.3 (0.3)	3.6 (0.4)	3.6 (0.5)	3.8 (0.5)	3.7 (0.5)

*Table includes 27 respondents who rated at least some items in this table. Some instructors were hesitant to rate all five items; Ns in the column headers reflect the number of respondents who completed at least four items and who were thus included in the "Average across items" calculation.

An "Amalgam" instructor in humanities also felt that students now "leave the class more curious about the phenomenon we studied, rather than thinking that we've answered everything."

Some instructors felt more confident that students read the materials outside of class and therefore devoted more class time to interpersonal activities. For example, a "Create" instructor in the social sciences explained:

Since they had a longer period of time to work on [in-class] activities, they were able to talk more with their classmates. They were able to ask their classmates more questions. They were able to answer some of their classmates' questions as well, so I would say there was definitely more collaboration, more feedback, real-time feedback from their peers as well.



As previously noted, some instructors did not complete all items in this section because they could not determine whether observed changes were due to the materials. Other instructors rated changes conservatively; for example, when asked to rate the difference in student motivation, a STEM “Create” instructor said:

I would say maybe—I would say “3, About the same.” Maybe it’s sometimes somewhat better than before. I don’t know if that’s specific to OER as much as it is—well, I mean, I think they’re more inclined to read something that they didn’t have to—if that makes sense? It’s there. All they have to do is click a link to go do the reading in the textbook. I think that might have helped some.

A “Create” instructor in the social sciences noted a similar difficulty in claiming causation. She said, “I definitely want to say that it inspired or made a difference, but I don’t want to say it was the only thing that contributed to this difference.” In expressing uncertainty about the impact of materials, several instructors mentioned other factors that changed: the university switched to a new learning management system in autumn 2016 and was preparing to provide iPads to every incoming first-year student starting in autumn 2018. Several instructors also began teaching online or hybrid-online courses at the same time as the implementation of affordable learning materials. Many of them were unwilling or unable to attribute changes in teaching and learning to the materials.

Discussion

Overall, this study found that most instructors who opt to use affordable learning materials were motivated by both student cost savings and hoped-for improvements in teaching and learning (including improved alignment and deepened learning). Given that most instructors cited both motivations, there was no obvious relationship between their motivations and the type of project they elected to pursue. Instead, project choices seemed driven by the availability of no-cost well-aligned materials. That is, instructors pursued the “Adopt” approach when a reasonably well-aligned open textbook existed; they took the “Curate” or “Amalgam” path when they had a wealth of choices among many well-aligned resources that addressed different pieces of their course; and they employed the “Create” technique when they faced a dearth of well-aligned resources. However, the nuances of instructor motivation influenced their perception of whether well-aligned materials existed. For example, “Curate” instructors wanted to push students’ intrapersonal cognition skills and therefore felt it appropriate to incorporate a range of disparate materials into their course.

In terms of project process, “Adopt” projects were relatively straightforward, finished on time, and required little additional effort throughout the semester. Other projects were more challenging and time-consuming.

“Create” projects demanded the most up-front effort and often required strong assistance from students, consultants, or editors. “Curate” projects could be accomplished alone and mostly on time, but required substantial ongoing revision after initial launch. Regarding changes to pedagogical

**On average, instructors
felt student motivation
and learning only mildly
improved**



practice, instructors cited some changes, but there was no clear link between the type of project and the extent of the change. On average, instructors felt student motivation and learning only mildly improved, although there was variation (including, on a descriptive basis, little improvement for “Adopt” courses but an obvious improvement for “Amalgam” courses).

Motivating Implementation

This study's results suggest that while instructors who use affordable materials are motivated by cost savings, many are also interested in improving the teaching and learning experience. Thus, the argument for affordable learning materials must expand to include benefits outside of dollars saved.³⁵ To do so, librarians can highlight the value of improved alignment and deepened learning—which inherently appeal to faculty—and discuss digital library materials and OER as potential vehicles to advance these goals.

In addition to improved alignment and deepened learning, the possibility of incorporating open educational practices may also appeal to faculty.³⁶ Open educational practices can be used to develop open assignments or meaningful and engaging assignments in which students work (often in collaborative groups) to create something useful.

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assignments in which students work (often in collaborative groups) to create something useful. For example, students may develop course materials for subsequent semesters by writing chapters for an open textbook, annotating a manuscript, or creating an interactive map. Libraries are well-suited to support the creation of open assignments. They offer wide-ranging expertise upon which instructors and students can draw, including information literacy, digital humanities and digital scholarship, geospatial information, copyright and licensing, collection curation, expert searching, preservation, and publishing. The prospect of creating assignments

or activities for open educational practices may be exciting for some faculty who hope to deepen student learning. As a side benefit, open assignments can be designed to help the instructor identify, review, or create relevant and affordable course materials for future students.

While many instructors may be interested in using affordable materials, they may also be deterred by the time and effort required to do so. In the project under study, instructors were incentivized through their project budgets, which could include course release time, supplemental compensation, editorial assistance, or other resources. However, they tended to be most enthusiastic about their project when it was collaborative. Working in pairs or teams allowed them to split up the work, become inspired by one another's experiences and ideas, and generally support conversations about improved alignment and deepened learning. Accordingly, rather than attempting to motivate individual instructors on an ad hoc basis, libraries might consider partnering with departments that are already interested in updating their curriculum. Indeed, as of this writing, the initiative under study is moving toward projects that involve entire departments rather than individual instructors.



Supporting the Implementation Process

As institutions design the support structures and timelines for their affordability initiatives, they should consider that project management and functional expertise (such as copyright assistance or technical support) are critical to the success of projects. Given that many instructors in this study were more ambitious than the time allotted for their work, project managers might also help identify phases of the undertaking and roll out changes over the course of more than one semester.

In addition to logistical support, instructors may need backing in terms of frameworks and processes. In this study, most instructors had an interest in improved alignment and deepened learning but had not explicitly defined these as goals—which in turn may make it difficult to redesign a course to maximize student learning. From the outset

of the project, program staff should help instructors examine their motivations and goals, which can then clarify the type and scope of their efforts. If the primary goal is cost savings, then adopting a complete OER textbook will be an efficient way to meet the goal. If the primary aim is to improve teaching and learning, then program staff can help instructors explicitly define specific goals in terms of pedagogical alignment, Deeper Learning, or both, and engage in a process of backward design to create or curate course materials that help meet those goals. In particular, research suggests that Deeper

Learning competencies cannot be built solely through lectures, rote memorization, and multiple-choice testing; rather, more “active learning” approaches such as discussion, collaborative group work, and creative project-based work may be necessary.³⁷ To support implementation, librarians can connect instructors with the many resources provided by the Hewlett Foundation for their Deeper Learning framework, including examples of teaching materials and approaches that support cognitive, intrapersonal, and intrapersonal skills.³⁸

While instructional designers or project managers may aid in guiding instructors through backward design, librarians are uniquely positioned to contribute to the process by helping them: (1) think through learning goals related to information literacy, research skills, and related skills; (2) orient to digital library materials and other freely available online content; and (3) get support as copyright issues or other challenges arise.

Planning Library Investments

Like individual instructors, college and university libraries need to consider their own goals for affordable learning to determine the scope of their initiatives and how they will allocate resources. For institutions primarily interested in student costs, libraries can emphasize projected cost savings, highlight popular OER textbooks and repositories, and consider participating in inclusive access models. While inclusive access was outside the scope of this study, libraries need to be aware of inclusive access and carefully consider their role in inclusive access initiatives at their institutions.³⁹ Inclusive access can appeal

From the outset of the project, program staff should help instructors examine their motivations and goals, which can then clarify the type and scope of their efforts.



to both instructors and institutions because it requires little or no course redesign and thus minimal resources in terms of support. However, if libraries seek to address both cost savings and the quality of the teaching and learning experience, then inclusive access may be only one in a suite of investments in affordable learning.

For institutions interested in advancing teaching and deepening student learning, the experiences of the project under study suggest that a collaborative approach will be most helpful. First, libraries should partner with other key units, such as learning technology units and teaching centers, which can contribute instructional design consultation and project management support. Second, within the library, clear roles need to be defined for experts—such as liaison librarians, instruction librarians, curators, copyright and publishing experts, and digital humanists—and how each can play a leading or supporting role in affordability initiatives. Third, after piloting an initial support model to ensure that it works smoothly, libraries might prioritize working with instructor teams—such as a group of instructors who teach a course or an entire department that has new strategic goals in terms of teaching and learning—over working with individual instructors.

Conclusion

College and university libraries can extend and strengthen the conversation around affordable learning by emphasizing its possibilities for improved teaching and learning. To unlock these possibilities, however, libraries need to be proactive in providing frameworks that motivate instructors, as well as supports that enable meaningful course redesign. Our results suggest that the Deeper Learning framework aligns well with instructor interests and thus may be useful in framing future research and conversations about goals for student learning and how those can be achieved.

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Appendix

Embedded Survey Items Used during Instructor Interviews

Please read and complete the following survey. Your answers will be kept confidential. Your survey answers will only be identified by a code number. Your name will not be used in any reporting. Data will only be reported in aggregate form.

Quality of Affordable Materials

Compared to traditional printed textbooks or readings used in this course in the past, how would you rate this course's digital materials in terms of the following characteristics? For each row, check the best answer.

	1 Much worse than previous	2 Somewhat worse than previous	3 About the same	4 Somewhat better than previous	5 Much better than previous
Good search capabilities (easy to find specific content)					
High-quality visuals (layout, images, diagrams)					
Engaging and interesting writing					
Understandable and clear writing					
Helpful and useful study aids (for example, review questions, quizzes, videos, or games)					
Relevant content (to the course's focus and your expectations for student learning)					
Current content (up- to-date with recent advances in the field)					



Integration of Affordable Materials

To what extent were this course's materials integrated into assignments and assessments?
For each row, check the best answer.

	1 Never	2 Almost never	3 Sometimes	4 Almost every time	5 Every time
Did you explicitly make students review the course materials (for example, by requiring quizzes on them, or requiring students to discuss them in class)?					
Was reviewing the course materials necessary to understand in-class material, lectures, or discussions?					
Was reviewing the course materials necessary to doing well on this course's assessments (quizzes, papers, exams)?					

Changes to Teaching

Compared to when you've taught this course in the past using traditional printed textbooks or readings, did adoption of OER change the design of your course in any of the following ways? For each row, check the best answer.

	1 No change	2 Some change	3 Quite a bit of change
Breadth of coverage (covering more or fewer topics than before)			
Depth of coverage (going more or less deep into key topics)			
Proportion of time spent on different activities (e.g., lecture versus group work versus discussion)			
Number of assessments			
Types of assessment			
Nature of final/most important assessment			
Time required for me to prepare for class			
Time required for me to grade assessments			



Changes to Student Learning

Compared to when you've taught this course in the past using traditional printed textbooks or readings, did your students perform better or worse, or about the same, in terms of . . .

	1 Much worse than before	2 Somewhat worse than before	3 About the same	4 Somewhat better than before	5 Much better than before
Their level of motivation and engagement?					
The quality of their participation during class activities and discussions?					
The quality of their collaboration with fellow students?					
The depth or quality of their learning?					
Their performance on assessments?					
Were there any other ways that your students changed for better or worse? [Explain]					

Notes

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2. In some institutions, the word *instructor* is associated with a particular rank or category. Participants in this study had various teaching appointments, and some were not considered faculty (for example, graduate teaching associates). We use the word *instructor* to be inclusive of the participants and their teaching appointments.
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9. Seaman and Seaman, *Inflection Point*, 16.
10. For examples, see Ohio Library and Information Network (OhioLINK), "OhioLINK Delivers Textbook Savings to Students via Price Agreements with Four Major Publishers," March 28, 2018, https://www.ohiolink.edu/press/ohiolink_delivers_textbook_savings_students_price_agreements_four_major_publishers; Indiana University, "Indiana University's eText Program Saves Students over \$3.5 Million," April 6, 2017, <https://itnews.iu.edu/articles/2017/indiana-universitys-etext-program-saves-students-over-3.5-million.php>.
11. FlatWorld, "FlatWorld Textbook Affordability Study," 2019, https://downloads.flatworldknowledge.com/reports/flatworld_textbook_affordability_2019-06.pdf.
12. Cheryl Cuillier, "Inclusive Access: Who, What, When, Where, How, and Why?" chap. 16 in *The Evolution of Affordable Content Efforts in the Higher Education Environment: Programs, Case Studies and Examples*, Kristi Jensen and Shane Nackerud, eds. (Minneapolis: University of Minnesota Libraries, 2018), <https://doi.org/10.24926/86666.0101>; Lindsay McKenzie, "The True Cost of Inclusive Access," *Inside Higher Ed*, February 5, 2019, <https://www.insidehighered.com/news/2019/02/05/college-hot-water-over-inclusive-access-programs-and-student-choice>.
13. Julia E. Seaman and Jeff Seaman, *Freeing the Textbook: Educational Resources in U.S. Higher Education, 2018* (Oakland, CA: Bay View Analytics, 2019), <http://onlinelearningsurvey.com/reports/freeingthetextbook2018.pdf>.
14. Except for a recent volume of scholar and commercial publisher studies of inclusive access—Tracy A. Hurley, ed., *Inclusive Access and Open Educational Resources E-Text Programs in Higher Education* (Cham, Switz.: Springer, 2020), <https://doi.org/10.1007/978-3-030-45730-3>—all studies we could identify regarding digital affordable learning materials had an explicit focus on OER. Studies of OER typically do not ask instructors to indicate whether they are using a full OER textbook, pieces of a textbook, or some other curation-oriented approach; however, examples and illustrations from these studies suggest a primary focus on OER textbooks.
15. Bliss, Robinson, Hilton, and Wiley, "An OER Coup"; Nicholas B. Colvard, C. Edward Watson, and Hyojin Park, "The Impact of Open Educational Resources on Various Student Success Metrics," *International Journal of Teaching and Learning in Higher Education* 30, 2 (2018): 262–76, <http://www.isetl.org/ijtlhe/pdf/IJTLHE3386.pdf>; Hilton, "Open Educational Resources, Student Efficacy, and User Perceptions."
16. Rajiv S. Jhangiani, Rebecca Pitt, Christina Hendricks, Jessie Key, and Clint Lalonde, "Exploring Faculty Use of Open Educational Resources at British Columbia Post-Secondary Institutions," 2016, https://bccampus.ca/wp-content/uploads/2016/01/BCFacultyUseOfOER_final.pdf.

17. Olga Maria Belikov and Robert Bodily, "Incentives and Barriers to OER Adoption: A Qualitative Analysis of Faculty Perceptions," *Open Praxis* 8, 3 (2016): 235–46, <http://dx.doi.org/10.5944/openpraxis.8.3.308>; Michael Troy Martin, Olga Maria Belikov, John Hilton III, David Wiley, and Lane Fischer, "Analysis of Student and Faculty Perceptions of Textbook Costs in Higher Education," *Open Praxis* 9, 1 (2017): 79–91, <http://dx.doi.org/10.5944/openpraxis.9.1.432>.
18. Bliss, Robinson, Hilton, and Wiley, "An OER Coup"; Eulho Jung, Christine Bauer, and Allan Heaps, "Higher Education Faculty Perceptions of Open Textbook Adoption," *International Review of Research in Open and Distributed Learning* 18, 4 (2017), <https://doi.org/10.19173/irrodl.v18i4.3120>.
19. Christopher Hassall and David I. Lewis, "Institutional and Technological Barriers to the Use of Open Educational Resources (OERs) in Physiology and Medical Education," *Advances in Physiology Education* 41, 1 (2017): 77–81, <https://journals.physiology.org/doi/full/10.1152/advan.00171.2016>; Bliss, Robinson, Hilton, and Wiley, "An OER Coup"; Belikov and Bodily, "Incentives and Barriers to OER Adoption."
20. Quantitative studies of student outcomes have examined classrooms that shifted from traditional commercial texts to open materials and have compared the two in terms of student course grades or completions. Across studies, the quality of methodological control varies widely, as does the quantity and type of courses and students under study. While results are mixed across methods and settings, the overall body of quantitative research points to a mildly positive impact of OER on student course completion and grades. For a review, see Hilton, "Open Educational Resources, Student Efficacy, and User Perceptions."
21. The university began piloting inclusive access under a separate program in 2019.
22. Grant Wiggins and Jay McTighe, *Understanding by Design* (Alexandria, VA: Association for Supervision and Curriculum Development, 1998).
23. The research team operated independently of the team who oversaw the management of the grant program; members of the research team did not directly support the work of grant recipients. The lead author's professional responsibilities include conducting research on the effectiveness of university support programs such as this one; after completion of this study, she also implemented the "Amalgam" approach in her own course. The second and third authors worked with the lead author as research assistants while completing doctoral work in the College of Education and Human Ecology. The fourth author had perhaps the most overlap with the program's management team because she served as the University Libraries' liaison to the program; in that role, she helped coordinate support from the libraries for the program and the grant recipients but was not involved in decision-making regarding how the program was managed.
24. Jae Hoon Lim, "Qualitative Methods in Adult Development and Learning," in *The Oxford Handbook of Reciprocal Adult Development and Learning*, ed. Carol Hoare (New York: Oxford University Press, 2011); Sharan B. Merriam, *Qualitative Research: A Guide to Design and Implementation* (San Francisco: Jossey-Bass, 2009).
25. Merriam, *Qualitative Research*.
26. In addition, instructors offered a smattering of "Other" reasons, which included the desire to collaborate with others in their department, a philosophical dislike of commercial textbooks or allegiance to open-source movements, or being directed by a supervisor or course coordinator to adopt the new affordable materials. These reasons were each offered by a small number of interviewees with no discernible variation across project types.
27. Wiggins and McTighe, *Understanding by Design*.
28. National Research Council, *Education for Life and Work: Developing Transferable Knowledge and Skill in the 21st Century* (Washington, DC: National Academies, 2012), <https://doi.org/10.17226/13398>.
29. Michael Quinn Patton, *Qualitative Evaluation and Research Methods* (Los Angeles: Sage, 2002).
30. Renate M. Kahlke, "Generic Qualitative Approaches: Pitfalls and Benefits of Methodological Mixology," *International Journal of Qualitative Methods* 13, 1 (2014): 37–52, <https://doi.org/10.1177/160940691401300119>.



31. John W. Creswell and Cheryl N. Poth, *Qualitative Inquiry and Research Design: Choosing among Five Approaches*, 4th ed. (Los Angeles: SAGE, 2018).
32. Patton, *Qualitative Evaluation and Research Methods*.
33. Patton, *Qualitative Evaluation and Research Methods*.
34. At this university during the period under study, most undergraduate course sections were taught face-to-face, with some fully online sections available to students who needed that option. However, "Amalgam" instructors seemed particularly likely to teach online: across the 10 sections of eight courses taught with affordable materials during the first semester of implementation, 4 sections were online and 6 were face-to-face.
35. David Wiley, "If We Talked about the Internet Like We Talk about OER: The Cost Trap and Inclusive Access," *Iterating toward Openness* (blog), November 8, 2017, <https://opencontent.org/blog/archives/5219>.
36. Marcos D. Rivera, Amanda L. Folk, Shanna Smith Jaggars, Kaity Prieto, and Marisa Lally, "Recasting the Affordable Learning Conversation: Considering Both Cost-Savings and Deeper Learning Opportunities," in *Recasting the Narrative: The Proceedings of the ACRL 2019 Conference, April 10–13, 2019, Cleveland, Ohio*, ed. Dawn M. Mueller (Chicago: Association of College and Research Libraries, 2019), 720–30, <http://www.ala.org/acrl/sites/ala.org/acrl/files/content/conferences/confsandpreconfs/2019/RecastingtheAffordableLearningConvo.pdf>.
37. While the definition of *active learning* is broad and loose, it tends to involve students working on an activity, often in small groups, rather than listening to a lecture. For overviews and specific examples, see Tom Vander Ark and Carri Schneider, *Deeper Learning for Every Student Every Day* (Seattle, WA: Getting Smart, 2014), https://hewlett.org/wp-content/uploads/2016/08/Deeper%20Learning%20for%20Every%20Student%20Every%20Day_GETTING%20SMART_1.2014.pdf; Maryellen Weimer, *Learner-Centered Teaching: Five Key Changes to Practice* (San Francisco, CA: John Wiley, 2002).
38. William and Flora Hewlett Foundation, "Education Program Strategic Plan," 2010, http://www.hewlett.org/wp-content/uploads/2016/11/Education_Strategic_Plan_2010.pdf.
39. As noted earlier, inclusive access critics are skeptical that it will remain an affordable alternative for students. Libraries are poised to offer expertise in these conversations, given their deep expertise in electronic resource purchasing and licensing, and their sometimes-fraught relationships with publishers regarding the steadily increasing cost of access to digital materials, particularly journal content. This is another facet of affordability conversations in which libraries should be present, with the hope that the future of inclusive access is different from the current state of online journal subscriptions.