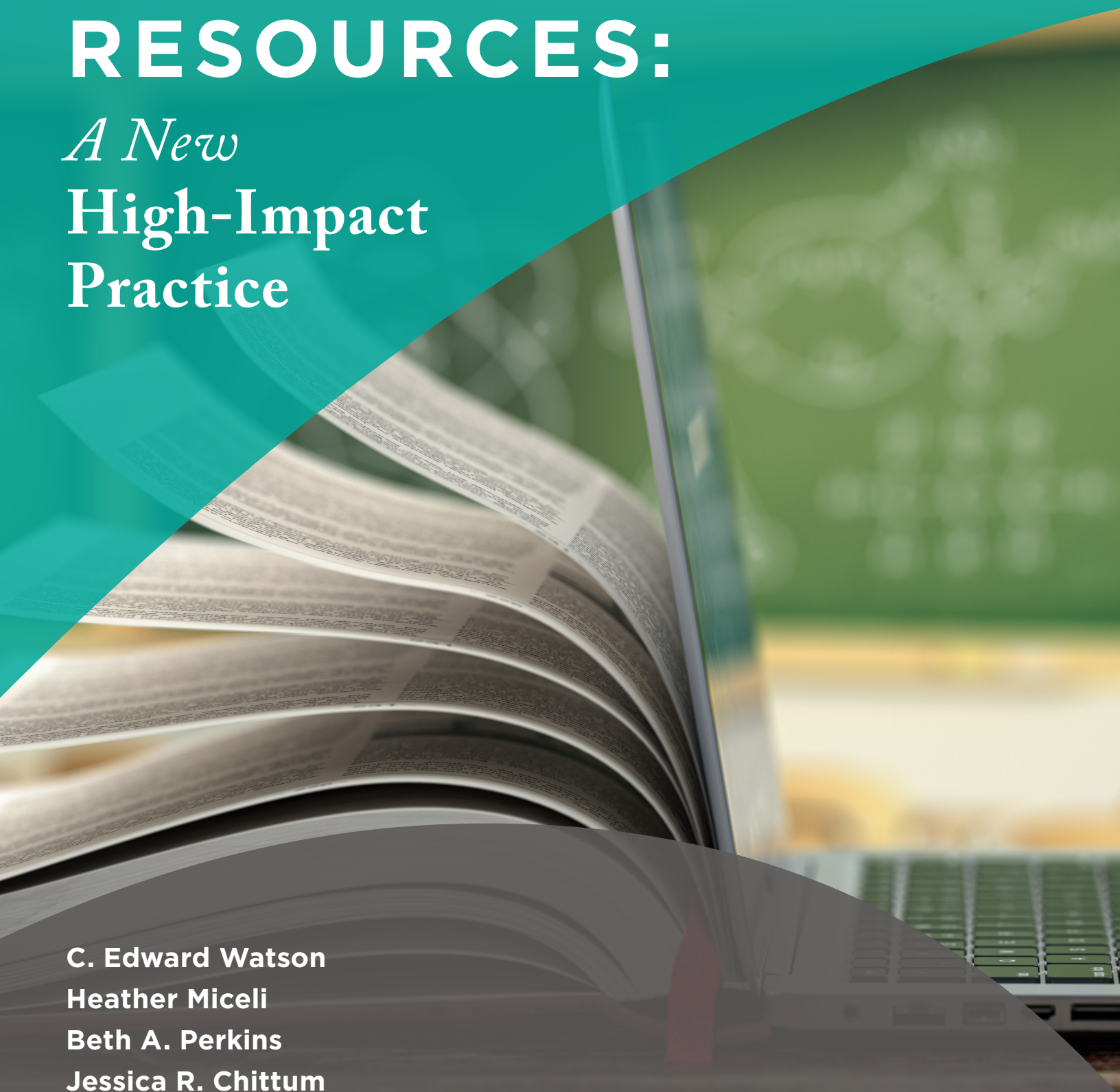
OPEN EDUCATIONAL RESOURCES:

A New High-Impact Practice



C. Edward Watson
Heather Miceli
Beth A. Perkins
Jessica R. Chittum
Hannah Schneider

AAC&U

OPEN EDUCATIONAL RESOURCES:

A New High-Impact Practice

C. Edward Watson
Heather Miceli
Beth A. Perkins
Jessica R. Chittum
Hannah Schneider

This research was conducted and made publicly available through a grant from The William and Flora Hewlett Foundation (2023-02433-GRA) intended to advance evidence on the efficacy of open educational resources (OER) higher education.

Please cite this report as follows: Watson, C. E., Miceli, H., Perkins, B.A., Chittum, J. R., & Schneider, H. (2026). *Open educational resources: A new high-impact practice.* American Association of Colleges & Universities.

1818 R Street NW, Washington, DC 20009

CONTENTS

Foreword

Over the past two decades, open educational resources (OER) have moved from a promising innovation to a central feature of conversations about access, equity, and effectiveness in higher education. What began as an effort to reduce the cost of textbooks has evolved into a broader rethinking of how knowledge is created, shared, and experienced in the classroom. This report arrives at a critical moment in that evolution.

As institutions grapple with rising costs, shifting student demographics, and increasing demands for measurable outcomes, the question is no longer whether OER should be considered, but how and under what conditions they can most meaningfully contribute to student success. This study responds directly to that question with a scale and rigor that sets it apart from much of the existing literature. Drawing on nearly 700,000 student records across 15 diverse institutions and enriched by the lived experiences of more than 200 instructors, it offers one of the most comprehensive examinations of OER implementation to date.

The findings presented here do more than affirm that OER can reduce financial barriers, though that alone remains a powerful and necessary justification. They demonstrate that OER, when thoughtfully implemented, can positively influence key indicators of student success, including course performance, withdrawal rates, and time to completion. At the same time, the report does not oversimplify these outcomes. It makes clear that context matters: the impact of OER is shaped by institutional environments, support structures, and pedagogical choices.

Equally important is the study's attention to the faculty experience. OER adoption is not a neutral substitution of materials. It is often accompanied by shifts in teaching practice, course design, and professional identity. The variability in instructor experiences highlighted in this report underscores a central truth: sustainable and effective OER initiatives depend on meaningful support, respect for faculty autonomy, and recognition of the labor involved in change.

By bringing together large-scale quantitative evidence and rich qualitative insight, this report advances the conversation beyond questions of cost and toward a more nuanced understanding of OER as a high-impact educational practice. It challenges institutions, policymakers, and educators to think carefully about implementation—not just adoption—and to invest in the conditions that allow OER to reach its full potential.

The work that follows is both a confirmation of what many have long believed and a call to action. If OER are to fulfill their promise, they must be integrated with intention, supported with care, and evaluated with the same thoroughness demonstrated here. Only then can they truly serve as a catalyst for a more equitable and effective system of higher education.

Lynn Pasquerella
President, AAC&U

Executive Summary

This report presents results from a 2-year comprehensive research study on open educational resources (OER) implementation and its impact on student success.

Our primary research goal was to examine OER at larger scale than existing research to better generalize the impact of OER on student success across institutional contexts and student populations. We collected data from 15 institutions, including those from six primary Carnegie-derived classifications, including almost 700,000 historical student records. In addition, we gathered qualitative responses from more than 200 instructors who have implemented OER in their courses.

Based on our data, we found the following:

- OER had a positive impact on withdrawal rates; however, the context in which OER implementation occurred lead to varying degrees of impact.
- Across all contexts, the number of "A" grades in a course increased with OER implementation.
- Taking at least one course in which OER was implemented had positive impacts on time-to-completion metrics for students who took longer than four years to complete their credentials. This trend was most notable at community colleges.
- The experiences of instructors who implemented OER, and the conditions under which implementation occurred, varied widely across multiple metrics.
- One-third of instructors who implemented OER reported at least one change in their teaching and learning practices following OER implementation.

Our findings are consistent with existing research; as such, we posit that the use and implementation of OER constitutes a high-impact practice (HIP). Even when the impact of OER implementation on student success is negligible, cost savings for students remain a significant outcome. However, in specific contexts, OER implementation can support student success, particularly among student populations traditionally underrepresented in higher education.

It is imperative that institutions support instructors implementing OER in ways that preserve their sense of autonomy while also ensuring access to adequate resources throughout the process, including financial resources, time, personnel, and professional development. Instructors who did not receive such support reported negative perceptions of their OER implementation, which can have downstream effects on their teaching practices.

Introduction

For more than two decades, open educational resources, or OER, have shifted the landscape of course materials in higher education.

Textbook costs have increased ahead of inflation, and as higher education has become more accessible to students from a diverse set of backgrounds, ensuring students have access to affordable course materials is now a common refrain on campuses across the country and around the world (Xie, 2026).

Affordability alone is a compelling argument for institutions to support the use of OER in classrooms, institutional or federal investment into OER initiatives is reported to yield up to four dollars in student savings for every dollar spent (SPARC, 2026). Although saving students money on their education is a worthwhile pursuit, the question remains whether using OER has further benefits for student success.

Currently, research on the impact of OER on student success is limited, with studies ranging from single-course studies conducted over a single term to meta-analyses of the same 20 or so frequently cited studies. The findings are varied and, taken together, inconclusive as to the impact of OER on student success metrics such as course completion, retention, and time to completion (e.g., Allen et al., 2015; Clinton & Khan, 2019; Engler & Shedlosky-Shoemaker, 2019; Grissett & Huffman, 2019; Jhangiani et al., 2025; Lantrip & Button, 2025; Medley-Rath, 2018; Spencer et al., 2025).

The present research stems directly from one of the often-cited foundational studies in the OER literature, Colvard et al. (2018), which was conducted by researchers at the University of Georgia, including the lead author of this report. The study's results indicated a significant decrease in DFW rates (i.e., the rate at which students earned final grades of D or F or withdrew from the course) and improvements in course grades where OER had been adopted, especially for students from populations historically underserved by higher education, as Pell-eligible students and students from racially and ethnically underrepresented groups. However, interpreting these results is complicated by a confounding factor: concurrently with the transition to OER materials, instructors also received instructional design support that included course redesign aligned with learning objectives. As a result, it is not possible to determine whether improvements in DFW rates were attributable to OER adoption, the accompanying course redesign, or to a combination of the two.

Given the current literature, our goal was to better understand how OER benefits students and instructors across a diverse range of institutions and courses with varied OER implementation approaches, timelines, and support structures. With generous support from the William and Flora Hewlett Foundation, we sought to expand quantitative research on student success metrics by collecting a large, representative sample of students and instructors across a diverse range of U.S.-based institution types and sizes to generate more generalizable answers to our questions about the efficacy of OER. Moreover, through qualitative methods, we aimed to clarify how differences in implementation characteristics might interact with student success metrics, thereby triangulating quantitative and qualitative data to illustrate the effects of OER across higher education. The research questions guiding our work are as follows:

RQ1:

Is there a relationship between OER implementation and student success in courses taught by the same instructor before and after implementation?

RQ2:

Are there differences in students' time to degree completion depending on OER exposure?

RQ3:

To what extent do implementation conditions and experiences differ by level of OER implementation?

RQ4:

How has the implementation of OER enabled different teaching and learning practices?

IS OER IMPLEMENTATION A HIGH-IMPACT PRACTICE?

The evidence reviewed in this report points to a compelling possibility: that OER, when implemented with intentionality and with equity in mind, merits consideration as one of AAC&U's recognized high-impact practices (HIPs). HIPs are well established in the research literature as powerful levers for student success in higher education, and two decades of evidence demonstrate that formal recognition of a practice as a HIP can meaningfully shape institutional attention, resource allocation, and implementation support. Expanding AAC&U's list of HIPs to include OER implementation also offers a promising avenue for addressing longstanding challenges of HIP access and implementation equity, ensuring that the benefits are not limited to the students who already have greatest access to them. It is our central argument that OER implementation, "when done well" (Kuh et al., 2017, p. 12) merits recognition as the 12th HIP.

Literature Review

HIGH-IMPACT PRACTICES (HIPS)

Almost two decades ago, AAC&U defined HIPs as educational practices that have positive impacts on student success, benefiting students from a variety of backgrounds, especially those students who are historically underserved by higher education (Kuh, 2008). Advantages of HIPs include but are not limited to "academic achievement; engagement in educationally purposeful activities; satisfaction; acquisition of desired knowledge, skills, and competencies; persistence; attainment of educational outcomes; and post-college performance" (Kuh et al., 2006, p. 5). As of the time of publication, there are 11 teaching and learning practices designated as HIPs.

Table 1: Existing High-Impact Practices

Capstone courses and projects	Internships
Collaborative assignments and projects	Learning communities
Common intellectual experiences	Service learning, community-based learning
Diversity/global learning	Undergraduate research
ePortfolios	Writing-intensive courses
First-year seminars and experiences	

Prior research has shown that participating in HIPs has overall positive effects on students' self-perceptions of their learning and engagement (e.g., Brownell & Swaner, 2011; Finley & McNair, 2013; Valentine et al., 2021). Additionally, such a robust collection of evidence has been gathered that many institutions promote, scale, and even require student participation in HIPs (Valentine et al., 2021). Not only do HIPs promote positive gains in student success, but they also show compensatory effects for students from populations that have been historically underserved by higher education (e.g., Finley & McNair, 2013; Valentine et al., 2021).

However, there have been documented challenges in HIP implementation, particularly around who can and does participate in specific programs. For example, underserved populations such as Black, Hispanic, and non-traditional college students, participate at significantly lower rates in study abroad, faculty-led undergraduate research, and learning communities (Valentine et al., 2021). Additionally, HIPs are typically institutionalized programs, requiring significant administrative and institutional buy-in. Only 3 of the current list of 11 HIPs (ePortfolios, collaborative assignments and projects, and undergraduate research) can be implemented and led by individual faculty without broader institutional infrastructure and support.

WHAT ARE OPEN EDUCATIONAL RESOURCES?

Open Educational Resources (OER) are "teaching, learning and research materials that make use of appropriate tools, such as open licensing, to permit their free reuse, continuous improvement and repurposing by others for educational purposes" (Miao et. al, 2019). Since the early 2010s, OER have been adopted by instructors across the United States, either by individual faculty or through departmental or institutional initiatives to replace costly textbooks and ensure access to course materials on the first day of class. Because the majority of OER are usually digital, they are easily linked through learning management systems and made immediately available to students often eliminating challenges associated with the timely purchase of course materials while navigating financial aid processes.

Given their open licenses, OER are highly functional and can be applied across classrooms; as the 5R framework of OER suggests, instructors may retain, reuse, revise, remix, and redistribute OER (Wiley, 2014). Not only are OER easy to simply adopt and use in a course but they can also be revised by individual faculty to incorporate specific course content, current events, or better reflect the geographical or demographic makeup of particular institutions and classrooms. As the framework suggests, OER can also be "remixed" with other openly available content, allowing instructors to create custom course materials. Given the open licenses, revisions and remixes can likewise be redistributed for public use, facilitating a culture of sharing across higher education.

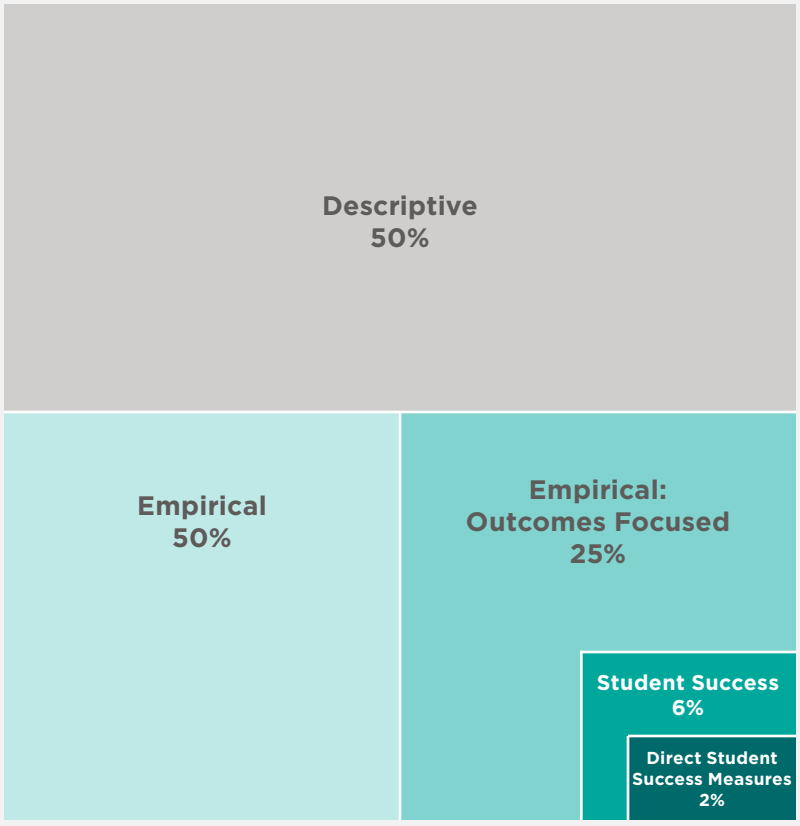
Two additional resource designations focus on ensuring access to course materials from the start of the course: zero-cost (ZTC) and low-cost. Zero-cost resources are not openly licensed, such as electronic library resources or course packs that use copyrighted material under fair use guidelines but have no cost to the student. All OER are zero-cost, but not all zero-cost materials are OER. Low-cost resources are those that fall below a designated dollar value, as determined by individual institutions (typically approximately around $50 or less). In many cases, low-cost courses are designated as such, not because of the textbook (which may in fact be an OER textbook) but because of integrated homework or similar systems that require an access code, lab or studio supplies, calculators, or other materials. Understanding and accounting for all three designations provides a more complete picture of how institutions approach course material affordability and the varied pathways through which students gain access to learning resources.

THE LANDSCAPE OF OER RESEARCH

One key goal of this work has been to identify, compile, and collate a significant portion of existing literature focused on various aspects of OER in higher education into a user-friendly, publicly-accessible database (available at aacu.org/oer-research-database/). Over the course of the 2-year project, we identified and annotated more than 1,200 relevant publications, which we carefully cited and qualitatively coded. Through the compilation of OER publications, we gained a deeper understanding of the landscape of OER research over the past two decades. Moreover, this research database provides users with ongoing and easy access to important publications organized by research type and topic. The OER research database is maintained as a growing resource, with new publications regularly identified and integrated to reflect current developments in the field.

Our qualitative coding of the existing literature revealed that, while approximately half of the publications report original research on OER, a relatively small proportion focus on measuring direct student outcomes—such as success, withdrawal rates, motivation, and engagement—as a function of OER exposure (Figure 1). This characteristic of the landscape is important; much of the existing work captures perceptions about OER rather than directly measured effects. Student success was examined in only 6% of studies in the overall database, and fewer still could be considered both large-scale and focused on the directly measured outcomes most relevant to the present study. Taken together, these findings confirm that large-scale, generalizable research in this area remains scarce, underscoring the need for the work presented here.

Figure 1: Characteristics of Existing OER Literature Within the OER Research Database



OER AND STUDENT SUCCESS

Postsecondary student success is commonly defined as "persistence and educational attainment or achieving the desired degree or educational credential" (Kuh et al., 2006, p. 11). Despite more than two decades of OER use in higher education, our understanding of how OER impacts student success remains limited. This is unsurprising given that educational phenomena are inherently complex, multidimensional, and highly dependent on context (Pascarella & Terenzini, 1991, 2005). The many confounding variables that influence individual student success—such as OER implementation context, other course attributes, institutional conditions, and student characteristics—make isolating the effects of any single intervention particularly challenging (Griggs & Jackson, 2017). That said, several existing studies have presented compelling arguments for adopting OER as a student success strategy by showing positive outcomes associated with course withdrawal rates, course grades/assessments, student retention, and time to degree completion. Given the varying results reported in existing literature, we argue that using metrics and methods that can account for and acknowledge differential patterns of success among students with diverse and complex backgrounds—including those from historically underserved ethnic groups, adult learners, and first-generation students (Kuh et al., 2006)—is critical to understanding the dynamic and multidimensional context of OER implementation in a course. In the following sections, we discuss the contrasting and often limited evidence in the existing body of research.

Course Withdrawal Rates

Student retention is recognized as a key measure of student success in higher education (Kuh et al., 2006). However, research on the effects of OER on course withdrawal rates has been varied. Evidence suggests that students are more likely to persist in courses when financial barriers to accessing required materials are reduced (Donaldson et al., 2019), resulting in decreased course withdrawal rates (e.g., Mayer, 2023; Squibb et al., 2023). At the same time, other studies have shown no significant differences in withdrawal rates between courses that use free materials and those that do not (e.g., Jhangiani et al., 2025; Lantrip & Button, 2025). In a meta-analysis of withdrawal rates in courses using OER, Clinton and Khan (2019) found a 29% decrease overall compared to courses with traditional textbooks; however, like their analysis of course grades, results across the included studies were inconsistent.

Course Grades/Assessments

Course grades represent an intuitive and commonly used proxy for student success in OER research; however, grades are among the most difficult outcome variables to interpret meaningfully. As Brookhart et al. (2016) established in their comprehensive century-long review of grading research, grades do not purely measure academic achievement but instead reflect a multidimensional construct that routinely incorporates both cognitive and noncognitive factors, including participation, effort, attendance, and instructor-specific grading decisions. Because grading practices differ across instructors and institutions (Brookhart, 1991; Brookhart et al., 2016), a grade assigned in one course context cannot be assumed to carry the same meaning as a grade assigned in another. When these reliability and validity concerns are compounded by the many individual student characteristics and contextual variables that influence course performance, isolating the effect of OER on student grades becomes particularly difficult.

This inconsistency is reflected in OER research. For example, a 2019 meta-analysis of more than 20 studies, encompassing over 100,000 student cases, reported no statistically significant difference in grades between OER and non-OER courses, although results varied across studies (Clinton & Khan, 2019). While some research has shown marked increases in course grades following OER adoption (e.g., Colvard et al., 2018; Hilton, 2016; Jhangiani et al., 2025; Mayer, 2023), at least one study has noted a negative effect (Gurung, 2017), and multiple others have shown no effect (e.g., Allen et al., 2015; Engler & Shedlosky-Shoemaker, 2019; Grissett & Huffman, 2019; Lantrip & Button, 2025; Medley-Rath, 2018; Spencer et al., 2025). A null effect on course grades is nonetheless an important finding, indicating that replacing a traditionally published textbook with OER does not diminish course material quality while still yielding significant cost savings for students.

Time to Completion

Students consistently report taking fewer courses when course materials are expensive (Donaldson et al., 2019), and access to OER textbooks has been associated with increased credit enrollment (Fischer et al., 2015; Robinson, 2015). However, more recent research suggests that, although community college students enrolled in courses with free or reduced-cost materials are twice as likely to graduate, they may take longer to do so (Diaz Solodukhin et al., 2025). This finding may reflect an unintended consequence of increased course retention: students who might otherwise have withdrawn from a high-cost course instead remain enrolled. These students are disproportionately likely to be from first-generation, low-income, and historically underserved racial and ethnic minority groups that already face well-documented academic challenges in higher education, independent of any single material barrier (Engle & Tinto, 2008; Terenzini et al., 1996). For these students, removing a cost-related obstacle to enrollment does not automatically resolve the broader constellation of pressures that can affect academic performance, and some may therefore require additional time to complete their degrees.

THE INSTRUCTOR EXPERIENCE WHEN IMPLEMENTING OER

An additional goal of our research was to better understand the conditions under which instructors implement OER, because a central argument for designating any teaching practice a high-impact practice is that student success metrics improve only when done well.

Motivation

Instructor motivations for implementing OER have been described as, for example, reducing costs for students, increasing learning efficiency by making course content immediately available, facilitating continuous improvement of instruction and personalized learning for students, enabling translation and localization of content, and providing students with equal access to resources (e.g., Algers & Silva-Fletcher, 2015; Herbert et al., 2023; Weller et al., 2015). These reasons for pursuing OER can be considered autonomous in nature and, as such, are associated with intrinsic motivation, which typically yields enhanced task engagement, persistence, and perceived enjoyment and value (Deci & Ryan, 2000). Likewise, prior research suggests that instructors' autonomous motivations to engage with OER were the strongest predictor of current and future OER use (Herbert et al., 2023). However, regardless of what we know about the importance of autonomous and intrinsic motivation to engage, many instructors implement

OER instead for extrinsic reasons or in response to external pressures, such as through departmental or institutional mandates (Allen & Seaman, 2016; Jhangiani et al., 2016). When OER adoption is driven primarily by external pressures rather than autonomously derived motivations, research suggests instructors may experience diminished engagement, reduced persistence, and less favorable perceptions of OER as a teaching tool (Deci & Ryan, 2000), thus considered an intrinsic barrier to OER adoption (LeMire, 2025).

Support Structures

The literature is rich with instructor perceptions regarding the extrinsic barriers and supports that can shape OER implementation success. Research has identified barriers as frequently social, economic, and/or technical in nature (Valle et al., 2026). Economic barriers often center on resource limitations, such as the time required to search for, evaluate, and adapt OER to fit specific course contexts (Jhangiani et al., 2016), and funding limitations needed for course releases, summer work time, and simply to keep the initiative moving forward (LeMire, 2025). Social barriers may include unsupportive colleagues and institutional cultures that do not value or incentivize OER work (Belikov & Bodily, 2016). Technical barriers, such as challenges navigating licensing frameworks or adapting content across platforms (LeMire, 2025), can also present meaningful obstacles for instructors.

On the other hand, research points to several forms of institutional and programmatic support that facilitate OER adoption and sustainability, including dedicated funding (Hollister & Patton, 2022); access to knowledgeable personnel such as OER librarians, instructional designers, and teaching center staff (Kimball et al., 2022; Smith, 2022); and reward structures that recognize OER contributions in evaluation and promotion processes (McKinney, 2024).

The Effects of OER Implementation on Changes to Teaching Practices

Little research exists on the influence of OER implementation on teaching practices even though instructors often build their courses around requiring a textbook (Skinner & Howes, 2013), and a growing body of evidence suggests that adopting OER may serve as a catalyst for broader shifts toward more student-centered, equitable, and engaged teaching. Hofer (2025) examined instructor levels of implementation, introducing the notion of “high” or “low” OER implementers based on whether or not the instructor incorporated accessibility, culturally responsive teaching materials, enhanced transparency of course content for students, and universal design principles in their course. Overall, research suggests that students perform better in courses with high-level implementation than in those courses with low-level OER implementation or no OER (Hofer, 2025). OER has also been found to influence pedagogical decision-making. Instructors who use OER in their courses often incorporate practices more centered on the student (Lazzara, 2024). This shift appears to deepen with experience: as instructors become more familiar with OER and open practices, their teaching tends to become more engaging and open (Nascimbeni & Burgos, 2019). Similarly, as instructors gain more experience implementing OER-enabled approaches, they report an evolution in their view of teaching more broadly, not just of OER specifically (Paskevicius & Irvine, 2021). Student perceptions of faculty who use OER tend to be significantly more positive particularly regarding constructs such as kindness, encouragement, approachability, and creativity (Vojtech & Grissett, 2017). Taken together, these findings suggest that OER adoption is not simply a “materials” decision but may facilitate a reorientation of how instructors think about their role in the classroom—one that increasingly centers on student access, agency, and engagement.

Methodology

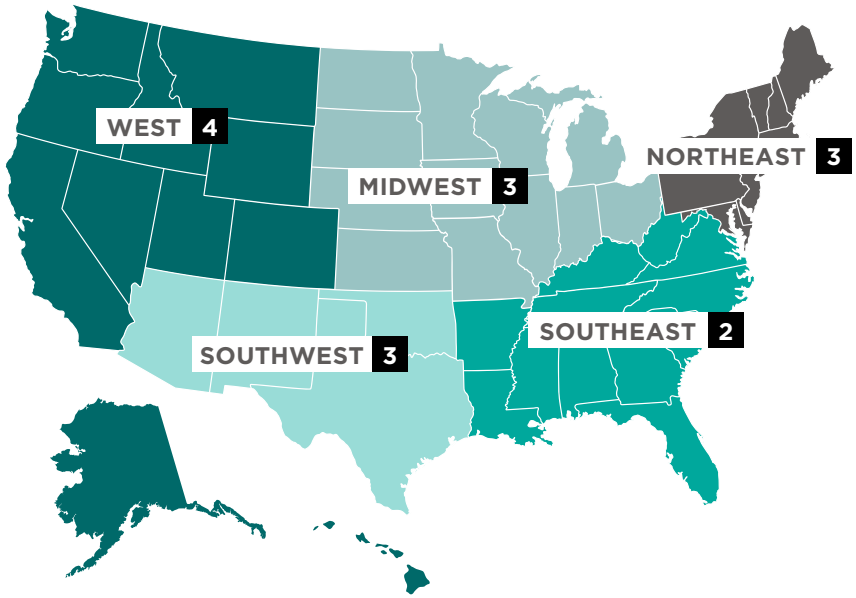
SAMPLE

Data for this study were collected at the institutional, instructor, course, and student levels, as described in the following sections.[1]

Participating Institutions

We identified institutions to participate in this study through two primary criteria. First, using data shared by OpenStax, we prioritized institutions that had adopted seven or more OpenStax textbooks in academic year 2022–23, with preference given to those with high student enrollment in OER courses. We also drew from institutions in underrepresented Carnegie classifications that had participated in AAC&U's Institute on Open Educational Resources. Fifteen U.S. institutions are represented, spanning five major geographical regions (Figure 2) and six Carnegie-derived classifications (Table 2). On each campus, we had one to two liaisons with whom we communicated and coordinated data collection.

Figure 2: Regions of the United States Represented by Participating Institutions



[1] Appendix A (available as a separate supplemental document) contains the complete methodology, including all codebooks and complete interview and survey protocols.

Table 2: Participating Institution Information

Carnegie-derived classification	No. of institutions	Student records	% of sample
Community colleges	3	445,887	64.0
Doctoral universities	3	88,528	12.7
Historically Black colleges & universities (HBCUs)	2	76,419	11.0
Private 4-year institutions	3	5,000	0.7
Regional public 4-year institutions	3	79,847	11.5
Tribal college	1	589	0.1

Instructors and Courses

Instructors included in the sample were required to have taught the same course pre- and post-OER implementation. In total, we collected data from 421 unique courses identified by liaisons, which spanned a range of course disciplines and were associated with 1,108 unique course instructors (Table 3).

Table 3: Course Characteristics Represented in the Sample

Course discipline	
Business	2%
Biological science, agriculture, & natural resources	10%
Physical science, mathematics, & computer science	16%
Other majors (not categorized)	19%
Social sciences	20%
Arts & humanities	32%

General education	
Unknown	2%
Not gen ed	16%
Gen ed	82%

STEM	
STEM	30%
Not STEM	70%

In addition to instructor and course metadata, we collected data from instructors via focus group interviews and a survey. For the focus groups, campus liaisons identified OER practitioners on their campuses who we described as "rockstars"—those who had been working with OER for a long time. Fifteen instructors participated in four 2-hour focus groups (one instructor from each participating institution; Table 4). Participants were awarded $400 for their time.

Table 4: Focus Group Sample Demos

Gender		Course discipline		Instructor level	
Male	8	Business	2	Instructor/non-tenure track	4
Female	7	Biological science, agriculture, & natural resources	1	Assistant professor	3
		Physical science, mathematics, & computer science	5	Associate professor	2
		Other majors (not categorized)	1	Professor	5
		Social sciences	1	Administrator	1
		Arts & humanities	5		

For the Instructor Survey, the instructors invited to participate were linked to the specific course sections they taught, so some instructors received more than one invitation. We requested unique responses for each course taught by the instructor. Thus, we sent 1,219 invitations, of which we received 269 responses (22% response rate). After excluding non-consenting participants, incomplete responses (≤ 16% completion), and instructors whose student records were removed during the initial data screening (see Appendix A), 240 unique instructor/course responses were retained for analysis (Table 5). Participation in the survey was incentivized through a raffle for a complimentary AAC&U conference registration or one of ten $50 Amazon gift cards.

Table 5: Instruction Survey Response Rate

	Number of surveys distributed	Number of surveys analyzed	Response rate %	Total instructor responses %	Associated student records *n*	Associated student records %
Community colleges	683	127	18.59	53	69,113	56
Doctoral universities	84	19	22.62	8	18,854	15
HBCUs	232	30	12.93	13	9,365	8
Private 4-year institutions	45	22	48.89	9	2,406	2
Regional public 4-year institutions	170	37	21.76	15	23,056	19
Tribal colleges	5	5	100.00	2	474	0
Total	**1,219**	**240**	**19.69**		**123,268**	

Student Records

In total, we collected 696,270 usable student records from courses taking place between Fall 2014 and Fall 2024 (Table 6).

Table 6: Student Sample Demos

Race/ethnicity	
Native Hawaiian or Other Pacific Islander	0%
American Indian or Alaska Native	1%
Non-Resident Alien	1%
Unknown	3%
Two or more races	4%
Asian	5%
Black or African American	13%
Hispanic or Latino	29%
White	44%

Locale	
Town	0%
Unknown	7%
City	22%
Suburban	35%
Rural	37%

Pell grant eligibility	
Unknown	21%
Not Pell-eligible	29%
Pell-eligible	51%

Gender	
Unknown	1%
Male	40%
Female	58%

Gen ed	
Unknown	1%
Male	40%
Female	58%

STEM	
STEM	30%
Not STEM	70%

Carnegie-derived classification	
Tribal colleges	0%
Private 4-year institutions	1%
Historically Black colleges & universities	11%
Regional public 4-year institutions	11%
Doctoral universities	13%
Community college	64%

Course discipline	
Business	2%
Biological science, agriculture, & natural resources	10%
Physical science, mathematics, & computer science	16%
Other majors (not categorized)	19%
Social sciences	20%
Arts & humanities	32%

DATA COLLECTION AND STUDY DESIGN

This study was reviewed and approved by an external Institutional Review Board on behalf of AAC&U. All participating institutions additionally obtained approval from their respective IRBs prior to data collection.

Given the complex goals of this study, data collection was multifaceted and included the four main data sources summarized in Table 7: (1) an institutional questionnaire; (2) course, student, and instructor metadata; (3) focus group interviews; and (4) the Instructor Survey. For full details regarding data collection from each source, see Appendix A.

Table 7: Data Sources

Institutional questionnaire

- Completed by campus liaisons.
- Gathered institution-level information about the implementation of OER on campuses plus a notion of how the COVID-19 pandemic and other large-scale disruptive events impacted campus operations and policies, such as around grading and treatment of course withdrawals.
- Questions about OER implementation focused on relevant statewide initiatives, campus initiatives, campus policies, available professional development, etc.

Instructor, course, and student data

- Instructor-level data included (a) instructor employment status, (b) years of experience, and (c) if they were a current instructor or not.
- Course-level data included (a) course name, (b) course level, (c) discipline, (d) relevant programmatic designations (e.g., general education, STEM, first-year experience), (e) course grades, and (f) course withdrawals.
- Student-level data included (a) demographic information, (b) Pell-eligibility, (c) full-time student status, (d) first generation student status, (e) total credits attempted/earned, (f) SAT/ACT scores, (g) high school GPA, (h) terminal GPA, (i) degree completion date.

Focus groups

- Participants were asked to describe their first experiences with OER, what they thought good vs. poor OER implementation looked like, how students were involved in OER implementation, and how their teaching practices changed with the implementation of OER.
- Transcripts were coded and organized into themes that were then used to develop the Instructor Survey.

Instructor survey

- Survey questions addressed (a) prior experience with OER, (b) motivations for implementation, (c) implementation conditions (e.g., compensation, personnel support, time release, professional development), (d) perceptions of institutional support; and (e) any teaching practice changes resulting from OER implementation.
- Distributed by campus liaisons to current instructors. Survey remained open for approximately 2-3 weeks, depending on the institution. Reminder emails were sent prior to closing to encourage participation.

Introducing Composite Learner Complexity (CLC)

Our dataset included notable missing data for many key student-level variables that would otherwise allow disaggregation to illustrate patterns of learning across diverse student groups. These missing data are expected and reflect the reality that many campuses face—not all students provide their demographic information, and institutional records are rarely complete. Rather than exclude students with incomplete records, we developed a composite variable incorporating highly relevant student-level data where available, allowing us to retain students in the final sample and capture meaningful variation in learner characteristics. Below, we describe this variable, *composite learner complexity* (CLC), its composition, and the methodological rationale behind it.

CLC encompasses known student characteristics that have been shown to impact student success and is composed of five key variables for this study (Figure 3): race/ethnicity, Pell Grant eligibility status, first-generation student status, age, and enrollment status. Scores range from 0-5, with one point assigned for each condition present, such that a score of 0 indicates none of the five characteristics apply and a score of 5 indicates all five are present. One point is added if:

- Race/ethnicity = Not White
- Pell Grant eligibility status = Pell-eligible
- First-generation student status = Yes (first generation)
- Age = Greater than 25 years
- Enrollment status = Part time

The included characteristics reflect social conditions associated with reduced access to critical support systems—social, financial, and familial—during students' time in higher education. This approach is consistent with Kuh et al.'s (2006) observation that

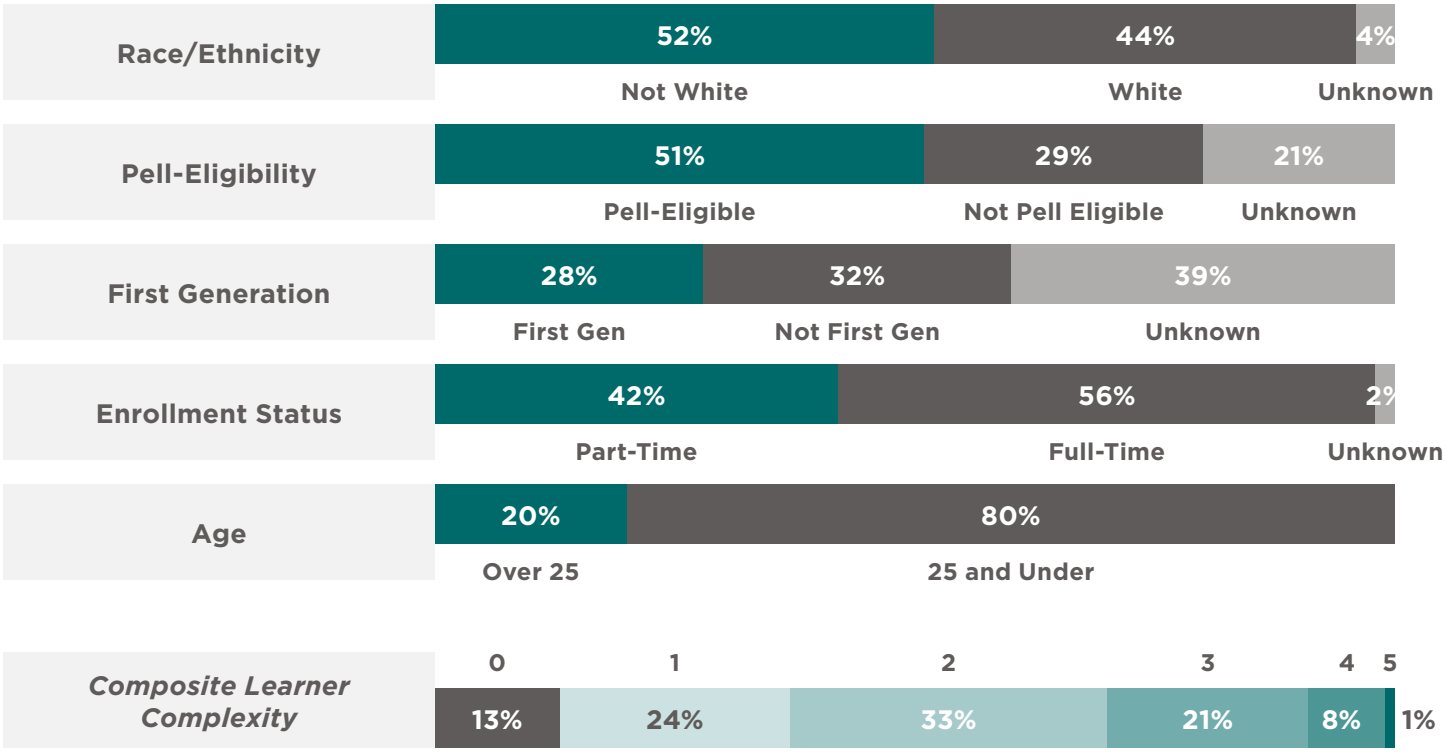
> Novel definitions are borne out of ingenuity and necessity and often require measures of multidimensional constructs. In part, their emergence is due to the increased complexity of the postmodern world and the need for institutions to be more inclusive of a much more diverse student population. (p. 6)

CLC represents an attempt to operationalize that complexity in a manner that is both analytically sound and grounded in the existing literature on student success.

In developing this variable, we were guided by theory rather than the data alone. Prior research consistently identifies each of these five characteristics as independently associated with differential outcomes in higher education (Calcagno et al., 2007; Choy, 2002; Crisp et al., 2015; Engle & Tinto, 2008; Kuh et al., 2006; Terenzini et al., 1996). Indeed, when we examined these characteristics individually, effect sizes were negligible—a pattern consistent with findings in the broader literature suggesting that no single demographic marker fully captures the compounding and intersectional nature of students' lived experiences (Crenshaw, 1989; Hurtado et al., 2012; Museus & Griffin, 2011). Combining them into a single composite, in a manner that reflects the intersectionality of students' social characteristics, yielded meaningfully larger effect sizes and revealed patterns that would otherwise remain hidden.

Finally, while CLC as operationalized here reflects the variables relevant to our study, we posit that CLC can be composed of whatever student characteristics an institution or researcher deems relevant to their research question, institutional context, and existing literature. The framework is intended to be flexible and transferable.

Figure 3: Descriptive Statistics for Individual Student Characteristics Included in the Creation of Our Composite Learner Complexity (CLC) Variable



Results and Discussion

The following results and discussion are organized around three student outcomes—course withdrawal rates, final course grades, and time to completion—as well as findings from the instructor survey.[2]

OER are associated with lower course withdrawal rates, though the magnitude of this relationship, depends on implementation context.

COURSE WITHDRAWAL RATES

For the overall sample, withdrawal rates were 7.8%. Consistent with prior research, we first used logistic regression to examine the extent to which OER implementation is predictive of course withdrawal rates. OER implementation was a statistically significant predictor of course withdrawal rates, $\chi^2(1) = 564.0$, $p < .001$. Predicted withdrawal rates were lower after OER implementation (7.1%) than before (8.6%). This result is encouraging, but the predictive utility of OER implementation in this model was low, as OER implementation explained 0.1% of the deviance in the model. A simple logistic regression model of student records does not account for potential differences in withdrawal rates across courses or institutions. That is, course withdrawal rates may be more similar for students taking the same course or students at the same institution than for students taking different courses or students at different institutions. Thus, we employed hierarchical linear modeling, an analytic approach that accounts for clustering at the course and institutional levels and allows for the inclusion of course- and institution-level variables—enabling a more nuanced understanding of the contextual factors associated with differences in withdrawal rates following OER implementation.

[2] Appendix B contains complete data tables for statistical results.

A Multi-Level Modeling Approach

Within our sample, we had students (696,270) nested within courses (421), which were nested within institutions (15). We first estimated a three-level model to understand how much variation in course withdrawal rates was distributed across each level. The majority of variation in course withdrawal rates was at the student level (74.8%), followed by institution level (15.6%), and then the course level (9.6%).[3] The amount of variation at the institution and course levels indicated differences in withdrawal rates across institutions and courses. In other words, knowing the institution a student attended or the course in which they were enrolled provided predictive information about the likelihood of withdrawal.

The best fitting hierarchical model[4] predicted course withdrawal rates from OER implementation, institution type, and composite learner complexity.[5] There was a 71.2% reduction in the institution-level variance and no reduction in the course-level variance, indicating that the combination of predictors explained a large portion of the differences in withdrawal rates between institutions but not between different courses. This is a meaningful result: institution type, OER implementation, and learner complexity together account for most of the systematic, institution-driven differences in whether students withdraw from a course. When considering the proportion of total variation in course withdrawal attributable to the institution level (15.6%), the final model explained approximately 11.1% of the total variation in course withdrawal.

Significance tests of each predictor revealed that the three-way interaction between OER implementation, institution type, and CLC was statistically significant (see Appendix B, Table B1). The relationship between course withdrawal rates and whether OER were incorporated in a course depended on the institution type and the CLC level; in other words, the potential impact of OER is not "one size fits all" and the context in which OER are implemented matter.

To visualize the three-way interaction between whether OER were implemented, institution type, and CLC, we calculated predicted withdrawal rates using the parameter estimates (see Appendix B, Table B2) from the model (Figure 4).

[3] The fit of the three-level model was compared to the fit of a two-level model (students nested within courses). The likelihood ratio test indicated that the institution-level variation was statistically significant, $\chi^2(1) = 181.94$, $p < .001$. The fit of the three-level model was compared to the fit of a two-level model (students nested within institutions). The likelihood ratio test indicated that the course-level variation was statistically significant, $\chi^2(1) = 11{,}000$, $p < .001$.

[4] To arrive at the final model presented, we estimated models with each individual potential predictor followed by models with multiple predictors and their interactions and compared model fit to determine which variables were meaningful predictors of course withdrawal rates.

[5] We combined CLC levels of 5 and 4 with CLC levels of 3 because only 1% of student records has a CLC level of 5 and some institution types had very small frequencies of CLC level 4. Given the other variables in the model, these small frequencies led to empty cells when the full range of CLC was included.

Figure 4: Predicted Withdrawal Rates by Institution Type, OER Implemented, and Composite Learner Complexity

Note. Each bar represents the average predicted course withdrawal rate (as a percentage) before and after OER implementation by institution type and composite learner complexity (CLC).

RESULTS AND DISCUSSION

The model's predicted withdrawal rates showed distinct patterns. For historically Black colleges and universities (HBCUs), regional public 4-year institutions, and private 4-year institutions, the predicted course withdrawal rates were similar prior to and after OER implementation. These differences were comparable across all levels of CLC within each institution type. Thus, for these institutions, OER was a net neutral intervention—it did not lead to adverse outcomes but no overwhelmingly positive impact on withdrawal rates was notable.

For community colleges, there was a different pattern; for everyone, the predicted course withdrawal rate was lower after OER were implemented. The decrease in course withdrawal rates was slightly larger for students with lower CLC levels than students with higher levels. There was also a less pronounced increase in withdrawal rates as CLC level increased, suggesting that the community colleges in our study likely had other supports in place to retain students.

As with community colleges, the predicted course withdrawal rates for doctoral universities and tribal colleges were lower after OER were implemented in courses. For these institution types, we noted two distinct patterns. First, before OER was implemented at the doctoral universities, there was a marked increase in course withdrawal rates as CLC level increased. When OER was implemented, the decrease in course withdrawal rates was larger for students at higher levels of CLC than for students at lower levels of CLC. This pattern may reflect the characteristically heterogeneous student populations at doctoral universities in terms of their student population, with typically larger course sections with less interaction between students and instructors and fewer support structures for students with higher levels of CLC. As such, OER in gateway and first-year courses may be enough to retain students who otherwise might have withdrawn from courses with costly textbooks or a barrier to buying course materials (Bay View Analytics, 2023).

Second, we observed the opposite pattern for tribal colleges. The decrease in course withdrawal rates was larger for students at lower levels of CLC than students at higher levels of CLC. At the same time, the overall course withdrawal rate was lower for students at higher levels of CLC than for students at lower levels of CLC. This may be because students with lower CLC levels are generally less represented at tribal colleges. These institutions are uniquely situated to support the majority of their student population, which is primarily students with one or more CLC characteristics. In this situation, the marked decrease in withdrawal rates at lower CLC levels shows that OER may be supporting the students who serve as the minority population at tribal colleges—those with fewer CLC characteristics.

KEY TAKEAWAYS

- **At community colleges, HBCUs, and private 4-year institutions, withdrawal rates do not increase substantially for students with high CLC, suggesting solid support systems in place for all students.**
- **Implementing OER at HBCUs, regional public 4-year institutions, and private 4-year institutions is a net-neutral practice in terms of withdrawal rates.**
- **Implementing OER at community colleges decreases withdrawal rates, which occurred at the same rate for all CLC levels.**
- **Implementing OER at doctoral universities decreases withdrawal rates for all students, but more importantly, could be a key retention strategy for students with higher CLC levels.**
- **Implementing OER at tribal colleges decreases withdrawal rates for all students, but with more marked decreases for students with lower CLC levels (the minority population at these institutions).**

Course Withdrawal Rates and Level of OER Implementation

To examine course withdrawal rate differences based on *lower level* (i.e., adopting an OER textbook as-is) or *higher level* (i.e., revising/remixing OER or creating original OER) OER implementation, we matched responses from the instructor survey with the historical student data. There were 123,268 student records to pair with the 240 unique instructor/course responses, and connecting these data allowed for a more nuanced examination of course withdrawal rates by level of OER implementation.

For this analysis, two institution types (private 4-year institutions and tribal colleges) were removed from the sample of 123,268 student records. The private 4-year institution records (n = 2,406) were excluded because only 39 students (1.5% of private 4-year institution records) withdrew from the respective course. The tribal college records (n = 474) were excluded because all instructors reported the same level of OER implementation (adoption of an OER). The removal of these data resulted in a final sample for this analysis of 120,388 student records.

Replicating the multi-level modeling approach from the first analysis, the data structure included students (120,388) nested within courses (140), which were nested within institutions (11). We first estimated a three-level model to understand how much variation in course withdrawal rates was present at each level of the model. The majority of variation in withdrawal rates was at the student level (83.1%), followed by institution level (7.8%), and course level (9.1%).[6] The decomposition of variance in this sub-sample varied slightly from that of the full sample, with there being more similar proportions of the total variance at the institution and course level.

For this analysis, we considered *OER implementation level*, which we defined as three distinct levels, in order: (1) OER were not implemented in the course (i.e., no OER); (2) an OER textbook was adopted without modification or customization (i.e., "lower" level implementation); (3) OER were revised, remixed, or created by the instructor (i.e., "high" level implementation). The best fitting hierarchical model[7] predicted course withdrawal rates from OER implementation level, institution type, and composite learner complexity. There was a 45.7% reduction in the institution-level variance and a 3.4% reduction in the course-level variance, indicating that the combination of predictors explained a large portion of the differences in course withdrawal rates between different institutions, and a small portion between different courses. When considering the proportion of the total variation in course withdrawal that was at the institution (7.8%) and course (9.1%) levels, the final model explained approximately 3.9% of the total variation in course withdrawals.

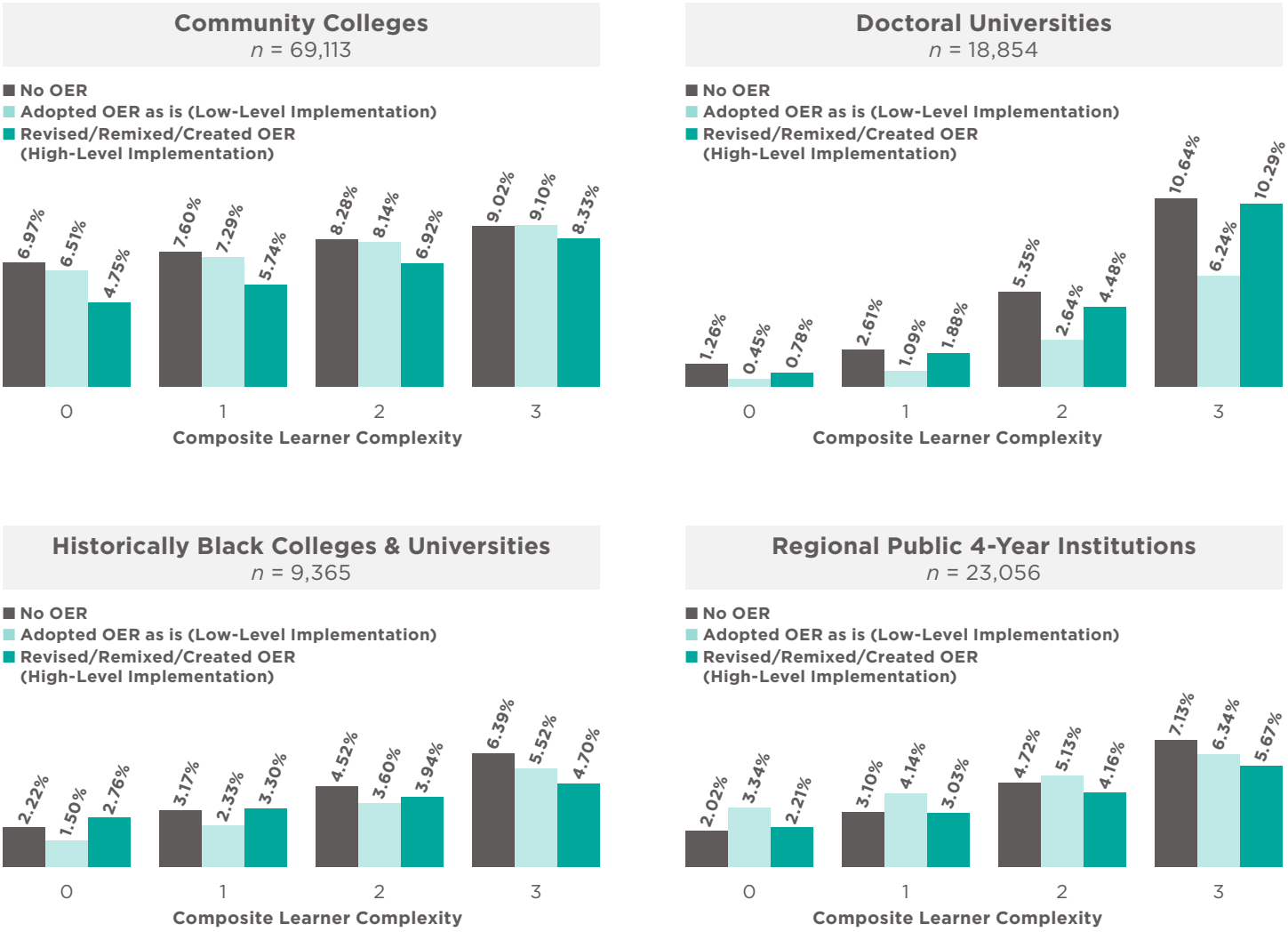
Examination of the parameter estimates revealed that the three-way interaction between level of OER implementation, institution type, and CLC was statistically significant, $\chi^2(6) = 14.4$, $p = .025$ (Appendix B, Table B3). Thus, the relation between course withdrawal rates and the level of OER implementation in a course depended on the institution type and the level of CLC.

To visualize the three-way interaction between the level of OER implemented, institution type, and CLC, we calculated predicted withdrawal rates using the parameter estimates (Appendix B, Table B4) from the model (Figure 5).

[6] The fit of the three-level model was compared to the fit of a two-level model (students nested within courses). The likelihood ratio test indicated that the institution-level variation was statistically significant, $\chi^2(1) = 33.1$, $p < .001$. The fit of the three-level model was compared to the fit of a two-level model (students nested within institutions). The likelihood ratio test indicated that the course-level variation was statistically significant, $\chi^2(1) = 1833.4$, $p < .001$.

[7] As with our examination of course withdrawals, to arrive at the final model presented, we estimated models with each individual potential predictor, followed by models with multiple predictors and their interactions and compared model fit to decide which variables were meaningful predictors of course withdrawal rates.

Figure 5: Predicted Withdrawal Rates by Institution Type, Level of OER Implementation, and Composite Learner Complexity



Note. Each bar represents the average predicted course withdrawal rate (%) for each level of OER implementation (as reported by the course instructor) by institution type and CLC level.

The relationship between OER implementation level and course withdrawal rates was context-specific by both institution type and CLC. For community colleges and regional public 4-year institutions, we saw that higher-level OER implementation consistently resulted in lower predicted withdrawal rates for all students than simply adopting an OER, suggesting that customizing content for the course and students can have a positive impact. This benefit was especially apparent at lower CLC levels, where there was a larger decrease in withdrawal rates for higher-level versus lower-level OER implementation. At higher CLC levels, there was a smaller difference in withdrawal rates based on OER implementation level.

For regional public 4-year institutions specifically, we also found that predicted course withdrawal rates were slightly higher with lower-level OER implementation than in courses with no OER for students at lower CLC levels. To investigate this unexpected pattern, we examined the distribution of courses in which OER textbooks were adopted and found that nearly two-thirds of those records came from non-STEM courses. Further examination revealed that average withdrawal rates decreased in STEM courses following OER adoption but increased in non-STEM courses, suggesting that the overall pattern may also be driven by course type rather than OER adoption alone. This finding points to a need to investigate whether OER adoption functions differently across disciplines, particularly given that data suggest STEM courses tend to carry higher textbook costs (Vitez, 2018) and may therefore show stronger effects when costly materials are replaced.

For HBCUs, there was a greater decrease in predicted course withdrawal rates with high-level OER implementation when compared to no OER for students with a higher CLC level than for students with a lower CLC level. This pattern suggests that customizing course materials may be especially beneficial for students navigating greater complexity at this institution type, although the reasons for this differential effect warrant further investigation.

Conversely, for doctoral universities, predicted course withdrawal rates were lower with lower-level implementation than with higher-level implementation. This difference was more pronounced at higher levels of CLC. It is worth noting that the higher-level implementation category in this analysis was disproportionately represented by a single, large-enrollment, gateway mathematics course—one in which elevated withdrawal rates might be expected independent of OER type. Taken together, these findings suggest that simply adopting well-established OER titles, such as OpenStax texts, in high-enrollment first-year or gateway courses may represent a practical and high-impact institutional strategy for reducing course withdrawals.

KEY TAKEAWAYS

- **In most contexts, revising, remixing, or creating OER has a more positive impact on withdrawal rates than adopting OER without modification—likely because higher-level implementation allows instructors to customize content specifically for their students, courses, and contexts.**
- **The influence of OER implementation on withdrawal rates is complex. In situations where withdrawal rates are higher than expected following OER implementation, other course characteristics (e.g., discipline or course type) may be contributing factors that warrant further investigation.**

In every context, the frequency of A grades in a course increases with OER implementation.

FINAL COURSE GRADE

To examine effects on final course grades, we analyzed differences in the percentage of each grade category (A, B, C, D, F) prior to and after OER implementation within a course. Of the 696,270 students included in the study, 641,750 (92.2%) completed the course and received a final course grade.

Overall, OER implementation corresponded with meaningful and statistically significant changes in course grade distributions (Figure 6, Appendix B, Table B5). The proportion of A grades increased by nearly five percentage points, and corresponding decreases in B, C, and D grades indicate a general upward shift in academic performance.

Figure 6: Percentages of Final Course Grade Prior to and After OER Implementation

However, F grades increased by 1% following OER implementation. When considered alongside the concurrent decrease in course withdrawal rates reported previously, this pattern suggests that OER may have supported students in remaining enrolled in courses they might otherwise have left, while some of those students continued to face academic challenges in meeting course expectations. This finding warrants further investigation into the types of academic supports that may complement OER adoption for students at greatest risk of course failure.

Institution Type

OER implementation was associated with different grade outcomes depending on institution type (Appendix B, Table B6). Although there was an increase in A grades for all institutions, larger[8] increases in A grades were observed for doctoral, private 4-year, public 4-year, and tribal colleges. Notably, for tribal colleges, there was also an increase in B grades—whereas all other institution types saw a decrease in B grades—alongside a larger decrease in F grades than observed at other institution types.

Composite Learner Complexity

Course grade distributions following OER implementation varied by composite learner complexity level (Appendix B, Table B7). As prior research would suggest (e.g., Engle & Tinto, 2008), students with higher levels of CLC—and thus more compounding risk factors—had higher percentages of lower grades overall. Notably, however, the pattern and magnitude of grade changes following OER implementation were similar for all grade categories across CLC except A grades. Students with lower CLC levels saw a larger increase in A grades than those at higher CLC levels. For all other grade categories, OER was associated with similar shifts in performance regardless of CLC level.

KEY TAKEAWAYS

- **In every context, As increased with OER implementation. Larger increases in A grades were observed for doctoral, private 4-year, regional public 4-year, and tribal colleges.**
- **Bs, Cs, and Ds decreased in almost every context.**
- **On average, Fs increased, which we suspect, in tandem with a reduction in withdrawal rates, is due to students persisting in the course but not succeeding.**

A Note About DFW Rates and This Study

In higher education research, DFW rates—defined as the proportion of students who receive a grade of D or F or withdraw from a course—are commonly used as a measure of student success. However, our analysis suggests that combining two distinct outcomes—student achievement and student persistence—into a single metric may obscure the effects of OER on withdrawal rates. Thus, we did not use DFW rates in our analyses and instead examined persistence separately from student achievement, as described in previous sections.

[8] Defined as a Cohen's h value of .10 or greater.

OER has positive impacts on time-to-completion metrics for students who take longer than four years to complete their credentials.

TIME TO COMPLETION

Time to completion in this study is defined as the date a student completed their credentials successfully. We collected each student's admission date, completion date, and whether they had withdrawn from or transferred out of the institution. These data allowed us to calculate time-to-completion for students admitted and completing between Fall 2014 and Fall 2024.

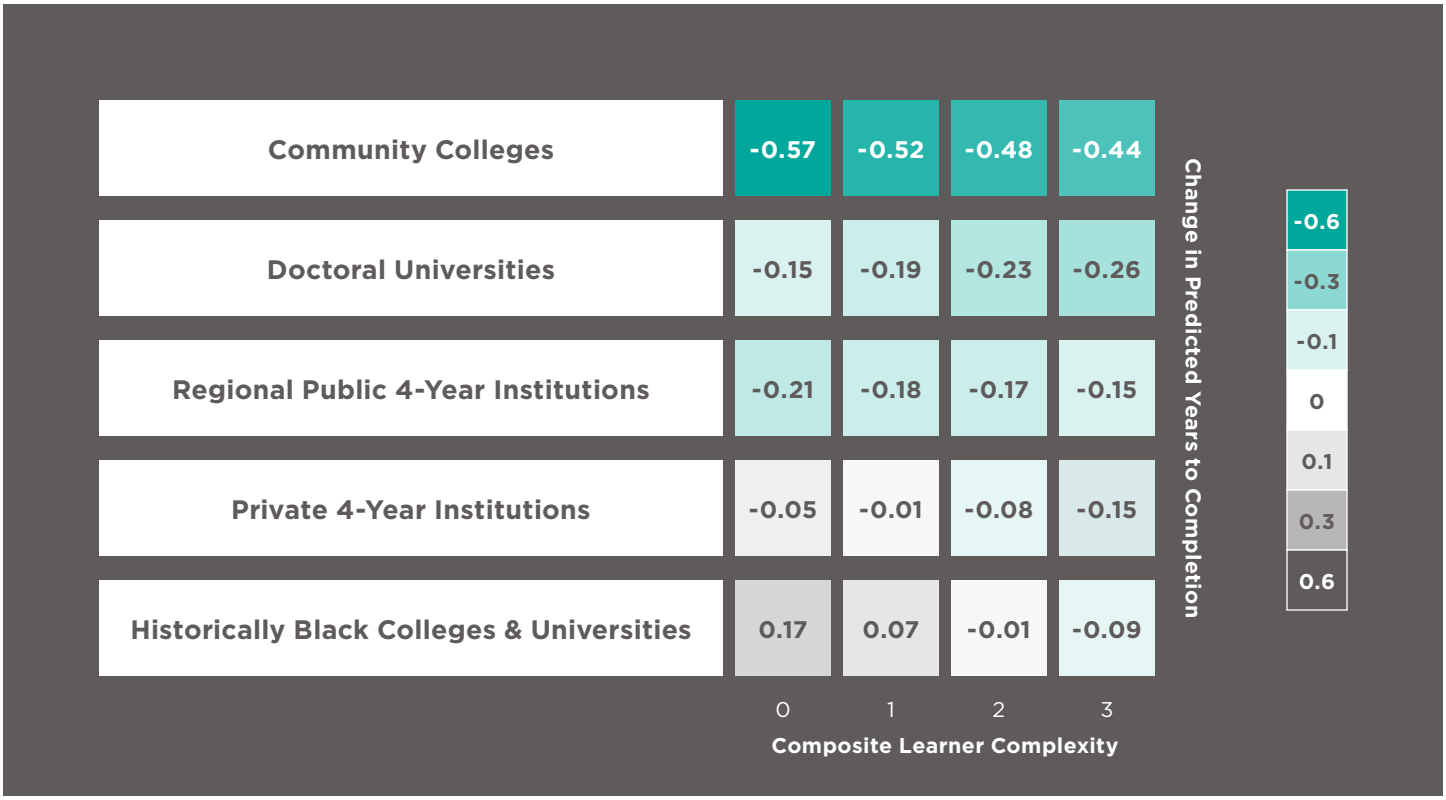
Of the 696,270 student records in the full sample, 200,386 students completed their time at the institution within that window. Because the majority of students completed within four years—and preliminary analysis indicated no significant relationship between OER exposure and time to completion for this group—we narrowed our focus to the 59,450 students for whom completion exceeded four years. This subset allowed us to examine whether OER exposure was associated with time to completion for students who fall outside typical degree timelines, where interventions supporting progress toward completion may have the greatest practical significance.

The championed linear regression model[9] consisted of whether students had taken at least one OER course, institution type, and CLC, predicting time to completion beyond four years (and all two-way and three-way interactions). This model was statistically and practically significant, $R^2 = .124$, $F(19, 59430) = 44.2$, $p < .001$, 95% CI [.119, .129].

All two-way interactions (OER courses X CLC, OER courses X institution, and CLC X institution type) were statistically significant (Appendix B, Table B8). To better understand the multiple two-way interactions, we calculated predicted time to completion using the parameter estimates from the model (Appendix B, Table B9) and converted the predicted values from months to years for ease of understanding (Figure 7).

[9] To arrive at the final presented model, we estimated models with each individual potential predictor followed by models with multiple predictors and their interactions. We then compared model fit to determine which variables were meaningful predictors of time to completion.

Figure 7: Predicted Years to Completion by Institution Type, Whether at Least One OER Course Had Been Taken, and Composite Learner Complexity



Note. This figure illustrates the difference in predicted time to completion (in years) between students who took no OER courses and those who took at least one OER course. Negative values indicate shorter time to completion, and positive values indicate longer time to completion.

Again, we found that context is key when it comes to understanding the differences in time to completion by the number of OER courses taken. Patterns of predicted time to completion varied across institution type and levels of CLC.

At community colleges, taking at least one OER course was associated with the largest reduction in predicted time to completion, with decreases of approximately half a year for all students. These reductions were slightly smaller for students with higher levels of CLC than for those with lower levels.

We observed a similar pattern at regional public 4-year institutions and doctoral universities, where taking at least one OER course was associated with a reduction in predicted time to completion of approximately one-fifth of a year. As with community colleges, the magnitude of this reduction for regional public 4-year institutions was slightly smaller at higher levels of CLC. However, for doctoral universities, reductions were slightly larger for students with higher levels of CLC than for those with lower levels.

At private 4-year institutions and HBCUs, taking at least one OER course was associated with a reduced time to completion for students with higher levels of CLC.

KEY TAKEAWAYS

- **In most contexts, taking at least one course with OER was associated with reductions in time to completion.**
- **The largest effect was observed at community colleges, where students taking OER courses had a reduced time to completion of about half a calendar year.**
- **At doctoral universities, private 4-year institutions, and HBCUs, reductions in time to completion were more pronounced among students with higher levels of CLC.**

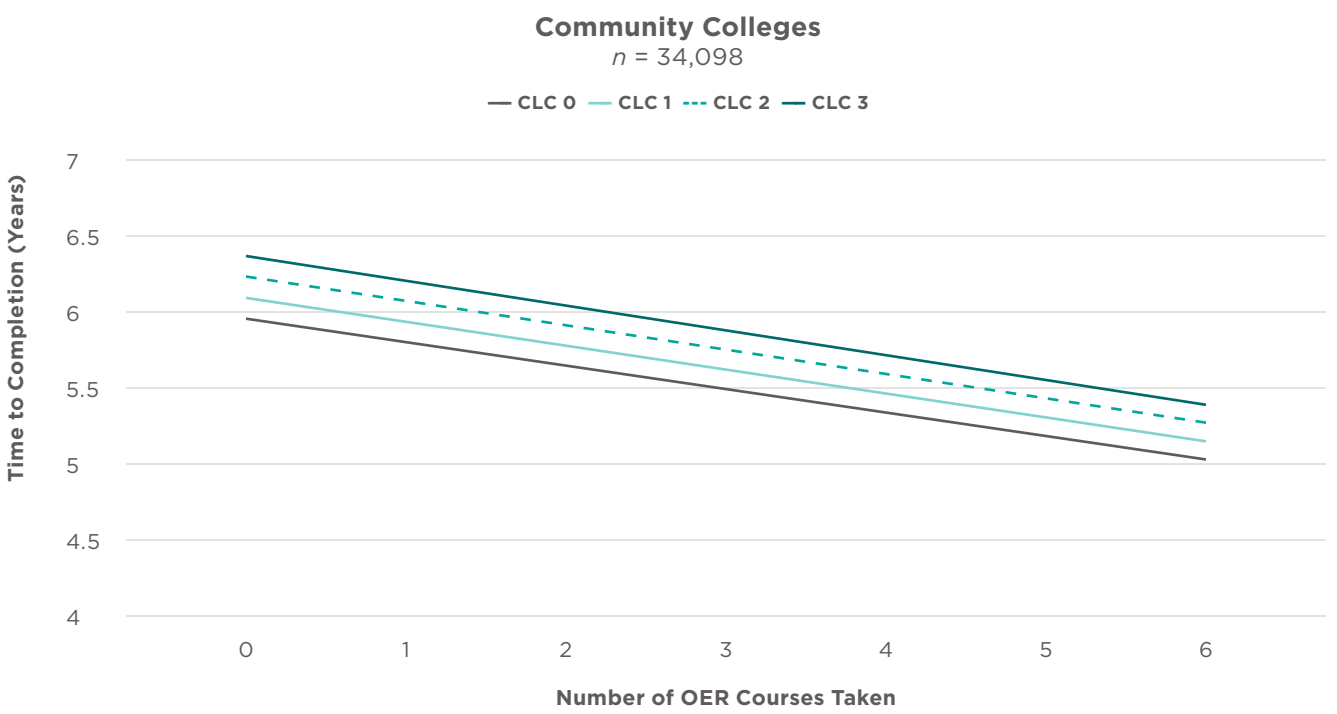
A DEEPER LOOK AT COMMUNITY COLLEGES

We observed a wide range in the number of OER courses completed by community college students over the 10-year study period, $M = 1.09$, $SD = 1.51$, range = 0-13. Thus, we conducted a linear regression analysis to examine the relationship between this larger range of the number of OER courses taken and time to completion beyond four years among community college students.[10] The model, which included number of OER courses taken and CLC as predictors, was statistically and practically significant, $R^2 = .028$, $F(3, 34094) = 331.3$, $p < .001$, 95% CI [.025 to .032].

There were significant main effects for both number of OER courses taken and CLC, though their interaction was not significant (Appendix B, Table B10). As expected, students with higher CLC levels had longer predicted time-to-completion than those with lower levels (e.g., Engle & Tinto, 2008; see Figure 8). Notably, predicted time to completion decreased as the number of OER courses taken increased. Across all CLC levels, students who took six OER courses completed their credentials approximately one year sooner than those who took none.

[10] Due to low frequencies of more than six OER courses completed, any number of OER courses greater than six were recoded as 6.

Figure 8: Predicted Time to Completion by Number of OER Courses Taken and Composite Learner Complexity for Community Colleges



Note. Each line represents the predicted course time to completion (in years) by the number of OER courses completed and composite learner complexity (CLC).

KEY TAKEAWAY

- **At community colleges, taking at least six courses with an OER can reduce time to completion by approximately one calendar year.**

The experiences of instructors who implement OER, and the conditions under which that implementation occurs, vary widely across many different metrics.

INSTRUCTOR SURVEY

We analyzed the 240 unique instructor/course survey responses to better understand motivations for OER implementation, types of support received, implementation time, perceived support from administrators, and perceived quality of their OER implementation in the course.

Level of OER Implementation (*n* = 240)

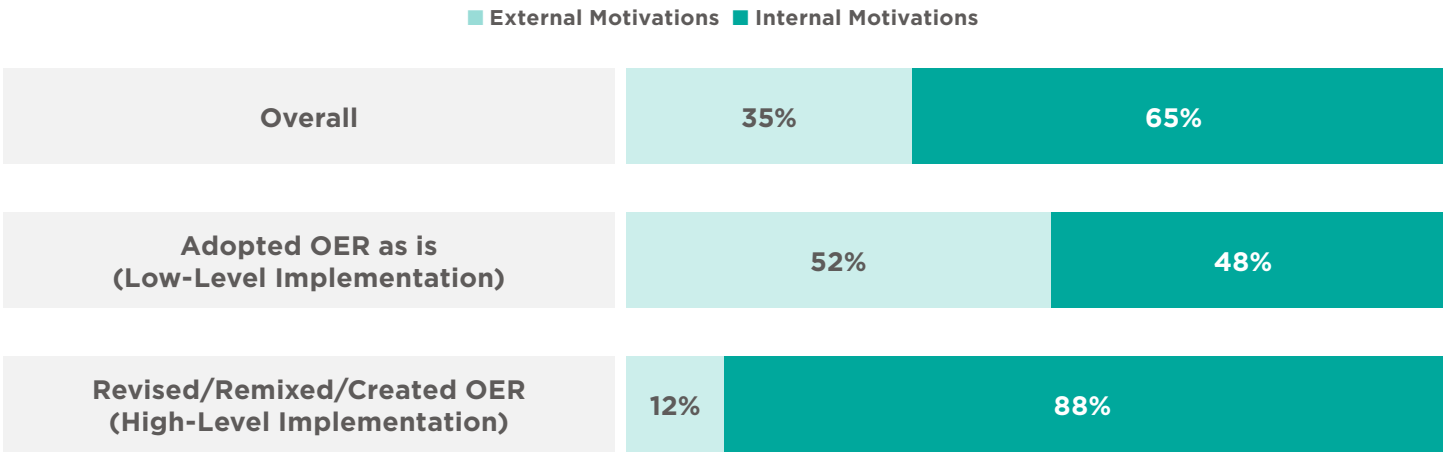
A slightly higher proportion of instructors adopted an OER textbook as is for their course (58%) compared to those who revised, remixed, or created OER materials (42%).

Motivation to Implement OER in This Course (*n* = 236)

Overall, the majority of instructors indicated that their motivations for implementing OER were internal (i.e., choosing to implement OER independently or in collaboration with others) rather than external (i.e., being required to implement OER or to use an OER textbook as part of a standardized course). When disaggregated by level of OER implementation, a clear pattern emerged: internal motivations predominated among instructors with higher-level implementation, whereas lower-level implementation was more evenly split between instructors who reported internal and external motivations (Figure 9).

Based on open-ended responses, the most common reasons for independently implementing OER included reducing student costs, ensuring accessibility on the first day, and being able to customize the OER to fit specific course contexts.

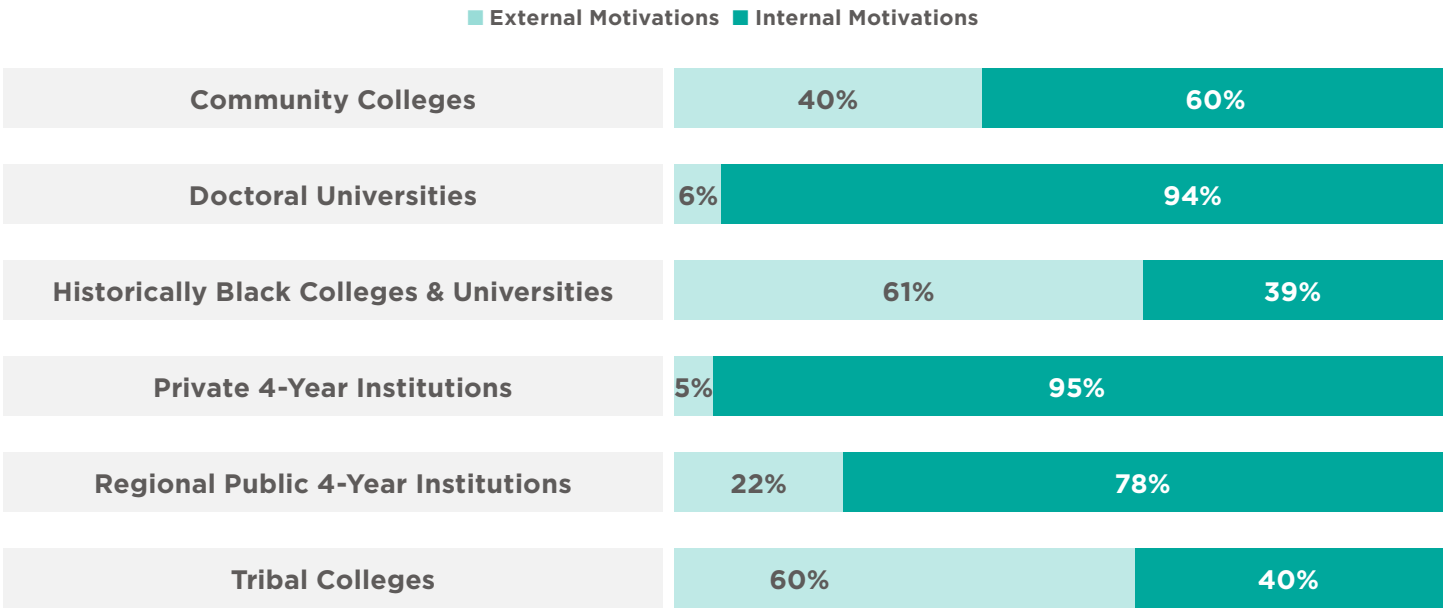
Figure 9: External Versus Internal Motivations to Implement OER; Overall and by Level of Implementation



There were notable differences in motivations across the six institution types (Figure 10). At doctoral, private 4-year, and regional public 4-year institutions, motivations for implementing OER were largely internal (78–95%) versus external (5–22%). At these institutions, OER implementation appears to be more individualized and less institutionalized, with instructors often independently adopting OER rather than participating in coordinated institutional initiatives.

In contrast, at community colleges, HBCUs, and tribal colleges, motivations were more evenly split between internal (39–60%) and external (40–61%) factors. This pattern may reflect the prevalence of multi-section, standardized courses at these institutions, where coordinated or institution-level OER initiatives are more common.

Figure 10: External Versus Internal Motivations to Implement OER by Institution Type



KEY TAKEAWAYS

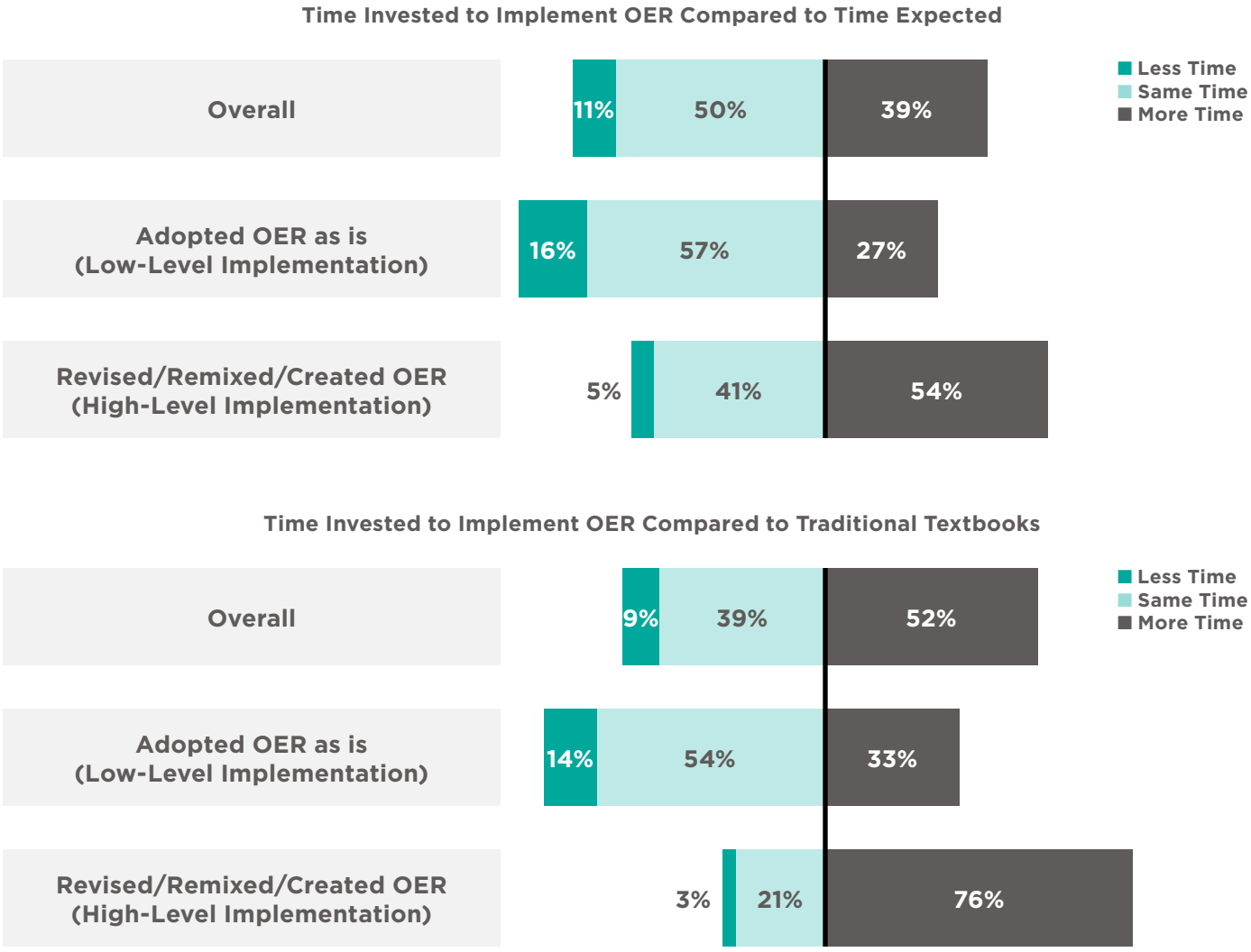
- **Instructors who revise, remix, or create OER are more likely to be internally motivated, with reducing student costs, ensuring access, and enabling customization being the top reasons.**
- **Instructors who are externally motivated or required to implement OER are more likely to adopt existing OER without modification, particularly in the context of institutional mandates or standardized courses.**
- **Patterns of motivation vary by institution type, likely reflecting differences in the extent of institutional OER programming versus individual instructor initiative.**

Time to Implement OER in This Course (*n* = 226)

The majority of instructors reported having adequate time to implement OER in courses (73%), with slightly higher agreement among those who adopted OER textbooks as is (75%) compared to those who revised, remixed, or created OER (69%).

When considering time investment relative to expectations and compared to traditional textbooks, most instructors associated with lower-level implementation reported that implementation required the same or less time than was needed with traditional textbooks. In contrast, most instructors with higher-level implementation noted that implementation required more time (Figure 11).

Figure 11: Amount of Time Invested to Implement OER Compared to Expected Time and Time to Implement Traditional Textbooks



KEY TAKEAWAY

- **Although many instructors reported having adequate time to implement OER, a notable proportion did not, especially among those engaged in revising, remixing, or creating OER.**

Support Received to Implement OER in the Course (*n* = 240)

Several questions on the instructor survey focused on the types of support instructors received to implement OER in their courses. These were grouped into four categories: support from personnel, financial support, time support, recognition, and professional development.

Overall, 67% of instructors reported receiving at least one form of support for OER implementation. A notably higher proportion of instructors associated with higher-level implementation reported receiving support compared to those who adopted OER textbooks as is (83% vs, 54%).

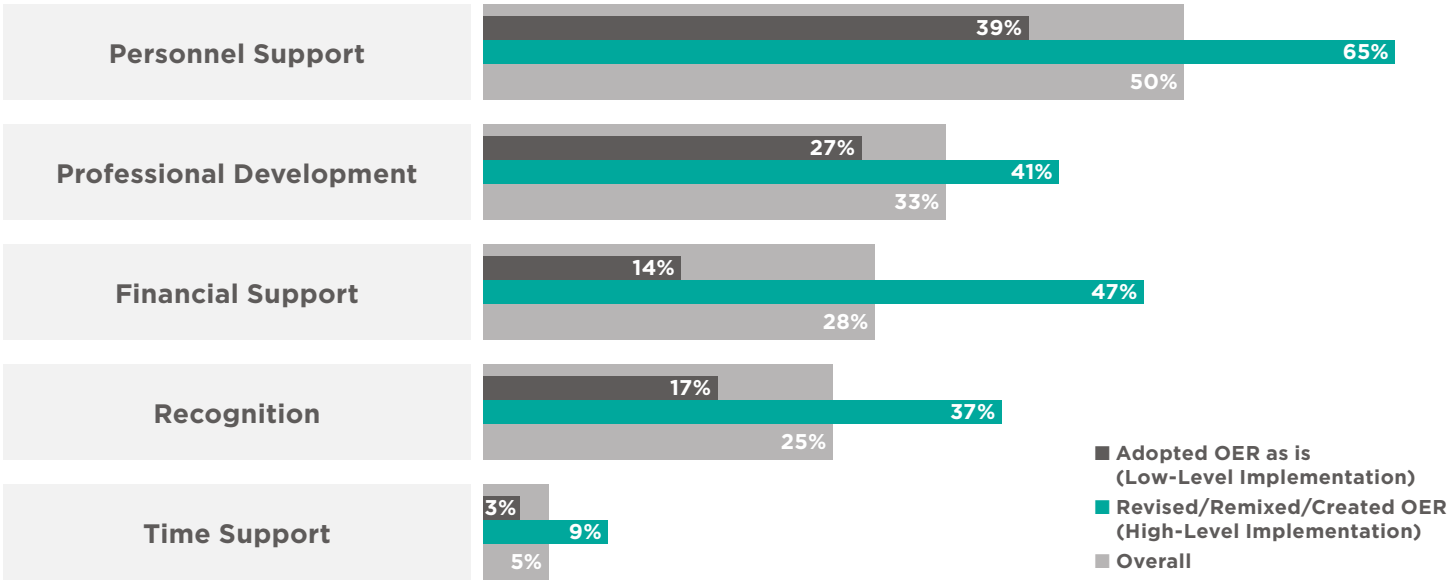
The most frequently reported type of support was from institutional personnel, with 50% of respondents reporting access to at least one form. Among those, 29% reported access to instructional designers, 26% to librarians, 22% to center for teaching and learning staff, and 5% to personnel from other campus units (e.g., online and distance learning or OER-specific offices).

Professional development was available to one-third of the respondents and included workshops, learning communities, and mentorship opportunities. Financial support was reported by 28% of respondents, mainly in the form of stipends and grants. One-quarter of respondents reported receiving recognition for their OER work, either through inclusion in tenure and promotion processes—across research, teaching, and service—or through formal awards.

Support in the form of additional time appeared least often in responses, with only 5% of instructors reporting access to course releases or summer stipends. Differences in support were also observed by level of OER implementation. Instructors reporting high-level implementation likewise reported higher rates of support across all categories, with the largest differences observed in financial support and recognition (Figure 12).

At the institutional level, patterns also varied. Instructors at tribal colleges reported receiving only financial and personnel support, while those at HBCUs only reported professional development, recognition, and personnel support. Notably, no instructors at private 4-year institutions reported receiving time support.

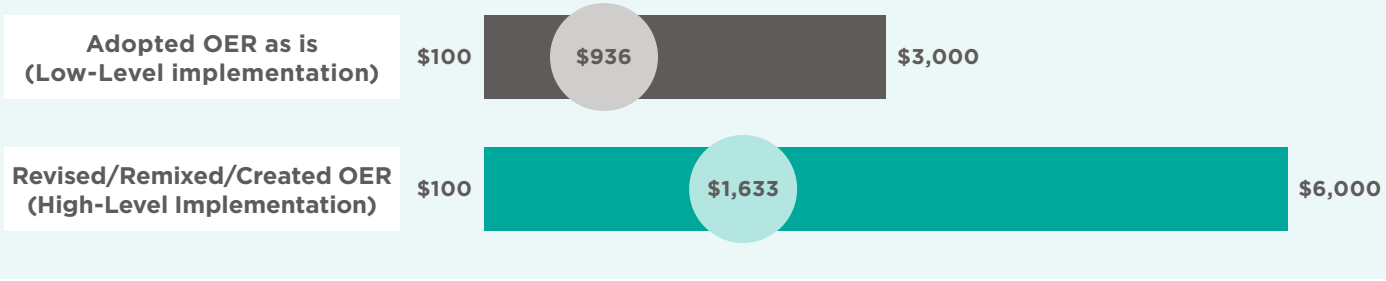
Figure 12: Support Received to Implement OER Within Their Course: Overall and by Level of Implementation



Amount of Financial Support

Of the 67 instructors who reported receiving financial support, 50 reported[11] the amount received. Instructors implementing OER at a higher level reported higher average levels of financial support and a wider range of supports than those who adopted OER textbooks as is (Figure 13).

Figure 13: Minimum, Maximum, and Average Financial Support Received to Implement OER by Level of Implementation



Perceived Support From Administration (*n* = 221)

When asked about support from administration when implementing OER, 90% of instructors reported feeling supported by at least one person in a supervisory or leadership role. These positive perceptions may reflect the composition of this study's institutional sample, which included institutions with demonstrated commitment to OER adoption.).

KEY TAKEAWAYS

- **Approximately one-third of instructors reported receiving no form of support (financial, personnel, time, recognition, or professional development), with lower rates of support among those who adopted OER as is compared to those who revised, remixed, or created materials.**
- **Personnel support was the most commonly reported form of support, with 29% of respondents having access to instructional designers, 26% to librarians, and 22% to center for teaching and learning staff.**
- **Time support was the least commonly reported form of support.**
- **Only 28% of instructors received financial compensation for implementing OER, most often among those who revised, remixed, or created OER.**
- **The average stipend was $966 for adoption of OER as is and $1,633 for revision, remixing, or creation of OER.**

[11] There were 54 instructors who reported the amount of financial support received. We removed four outliers due to the high total dollars reported, which would typically be associated with external grants or larger initiatives (i.e., $12,000 or more).

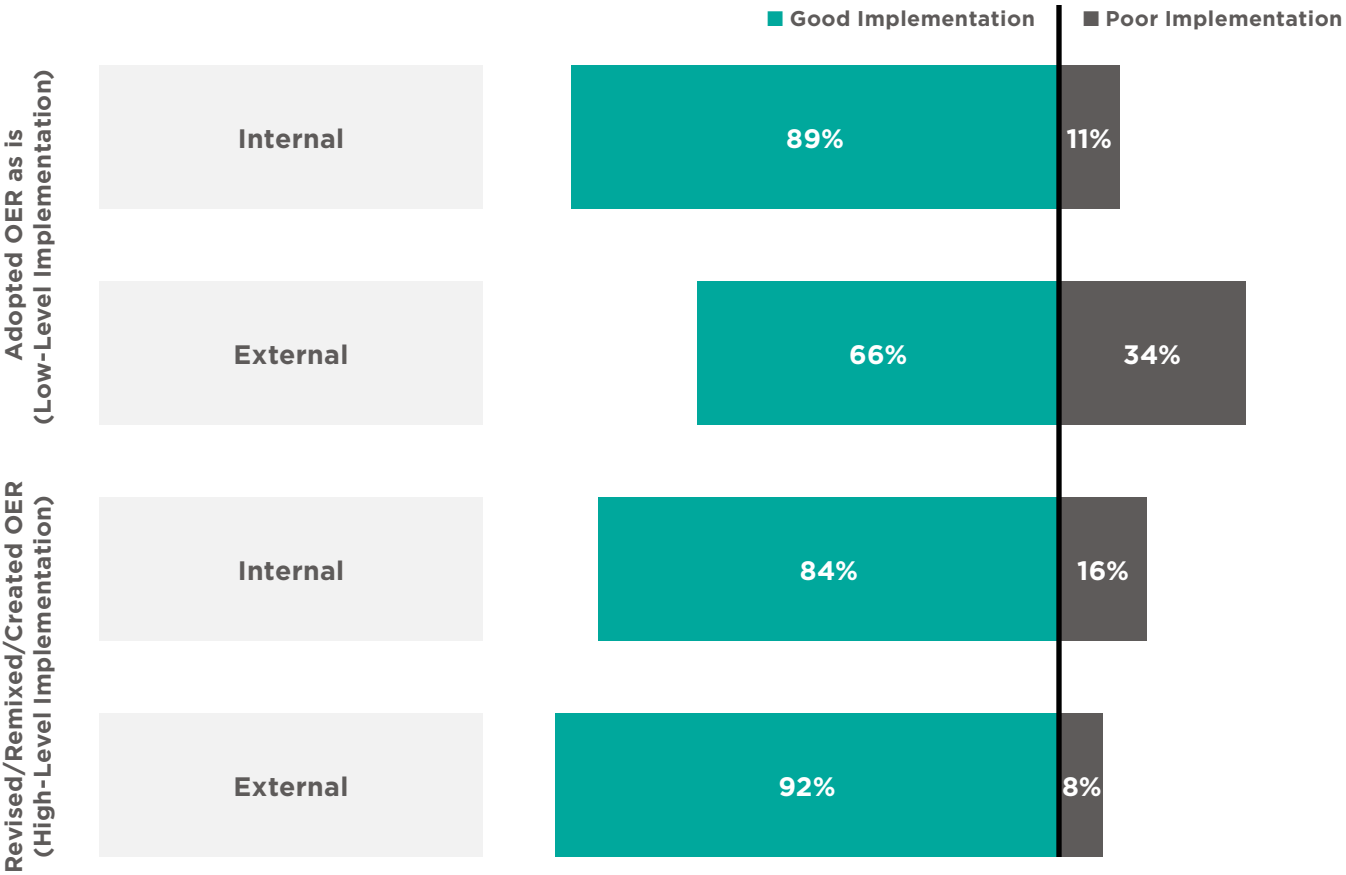
Perceived Quality of OER Implementation (*n* = 227)

Instructors largely reported "good" (81%) quality OER implementation during the first semester of use. Perceived quality was slightly higher among those with higher-level implementation (85%) compared to lower-level implementation (78%).

Perceived Quality and Implementation Motivation (*n* = 224)

We further examined perceived quality of OER implementation by motivation (external vs. internal) and level of implementation (low vs. high). A notably higher proportion of instructors rated implementation quality as poor with lower-level implementation and external motivation (Figure 14).

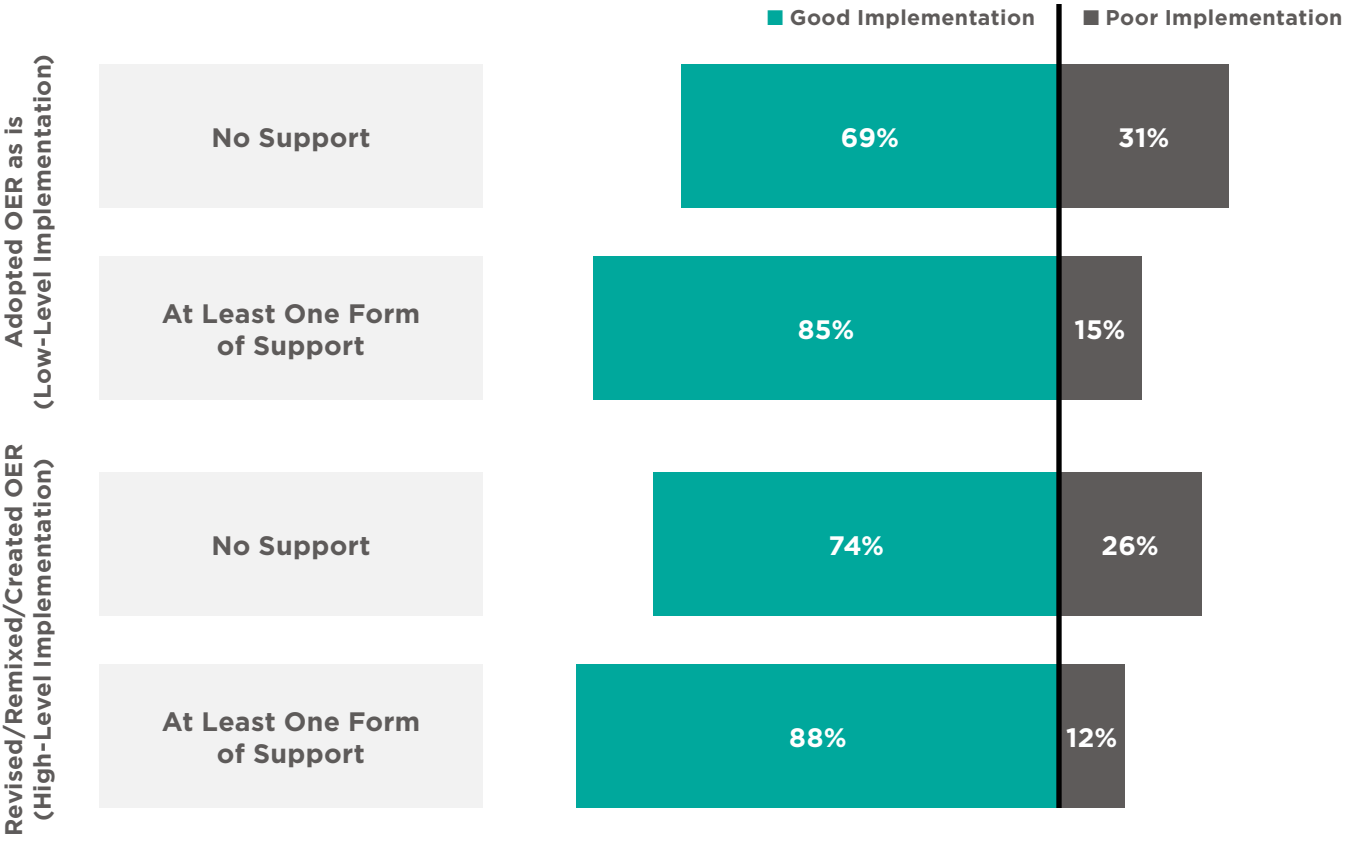
Figure 14: Perceived Quality of OER Implementation by Implementation Level and Motivation to Implement OER



Perceived Quality and Support Received by Implementation Level (*n* = 227)

We further examined perceived quality of OER implementation by whether instructors received at least one form of support (i.e., financial, personnel, time, recognition, professional development) and by level of implementation. Overall, most instructors rated their initial OER implementation as good, with higher ratings among those who received at least one form of support. A higher proportion of instructors reported poor implementation quality with lower-level implementation and without any form of support (Figure 15).

Figure 15: Perceived Quality of OER Implementation by Implementation Level and Whether Support Was Received



KEY TAKEAWAYS

- **The majority of instructors rated the quality of their in initial OER implementation as good.**
- **Perceived quality was higher among instructors who revised, remixed, or created OER materials.**
- **Instructors who rated implementation quality as poor were more likely to be externally motivated (i.e., required to implement OER) or to have received no support.**

One-third of instructors report at least one change to their teaching practices following initial OER implementation.

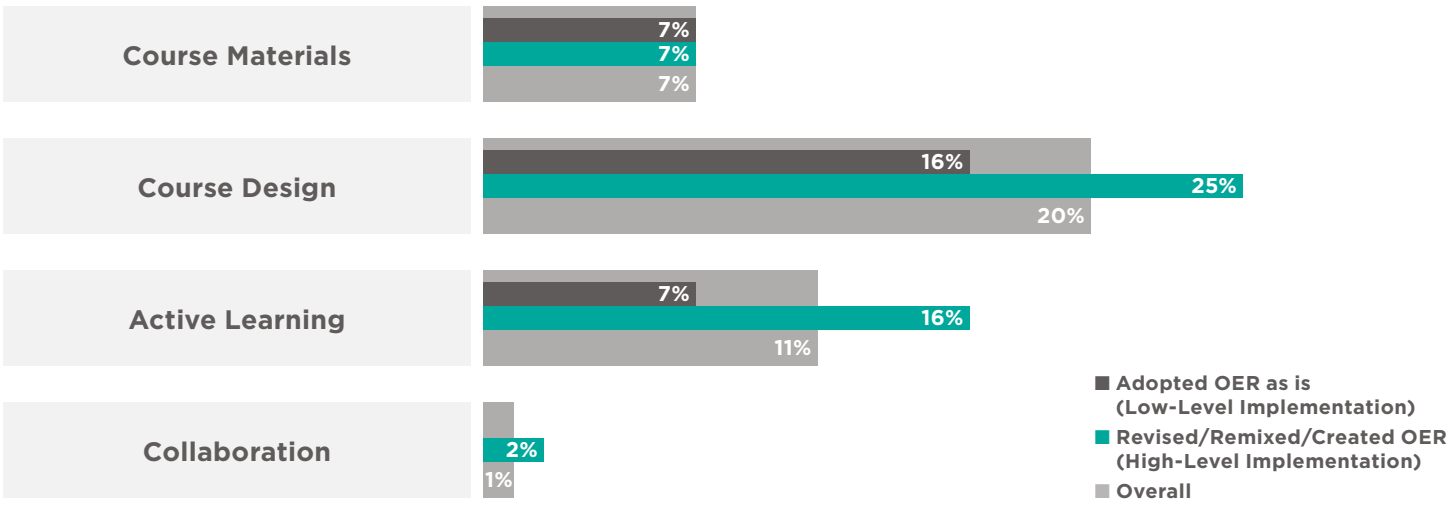
Changes to Teaching Practices (*n* = 240)

We also asked instructors about changes to their teaching practices following OER implementation. Anecdotally, we know that OER implementation can prompt broader instructional changes, either through associated professional development (e.g., guidance on backward design when integrating OER) or through increased alignment with the values of open education.

Only 33% of instructors reported making at least one change to their teaching practices after implementing OER. A notably higher proportion of instructors implementing OER at a higher level reported making changes (45%) compared to those who adopted OER textbooks as is (23%).

The most frequently reported changes involved course design followed by active learning strategies, course materials, and collaboration. Differences were particularly evident in course design and active learning, where instructors with high-level implementation reported higher rates of change (Figure 16).

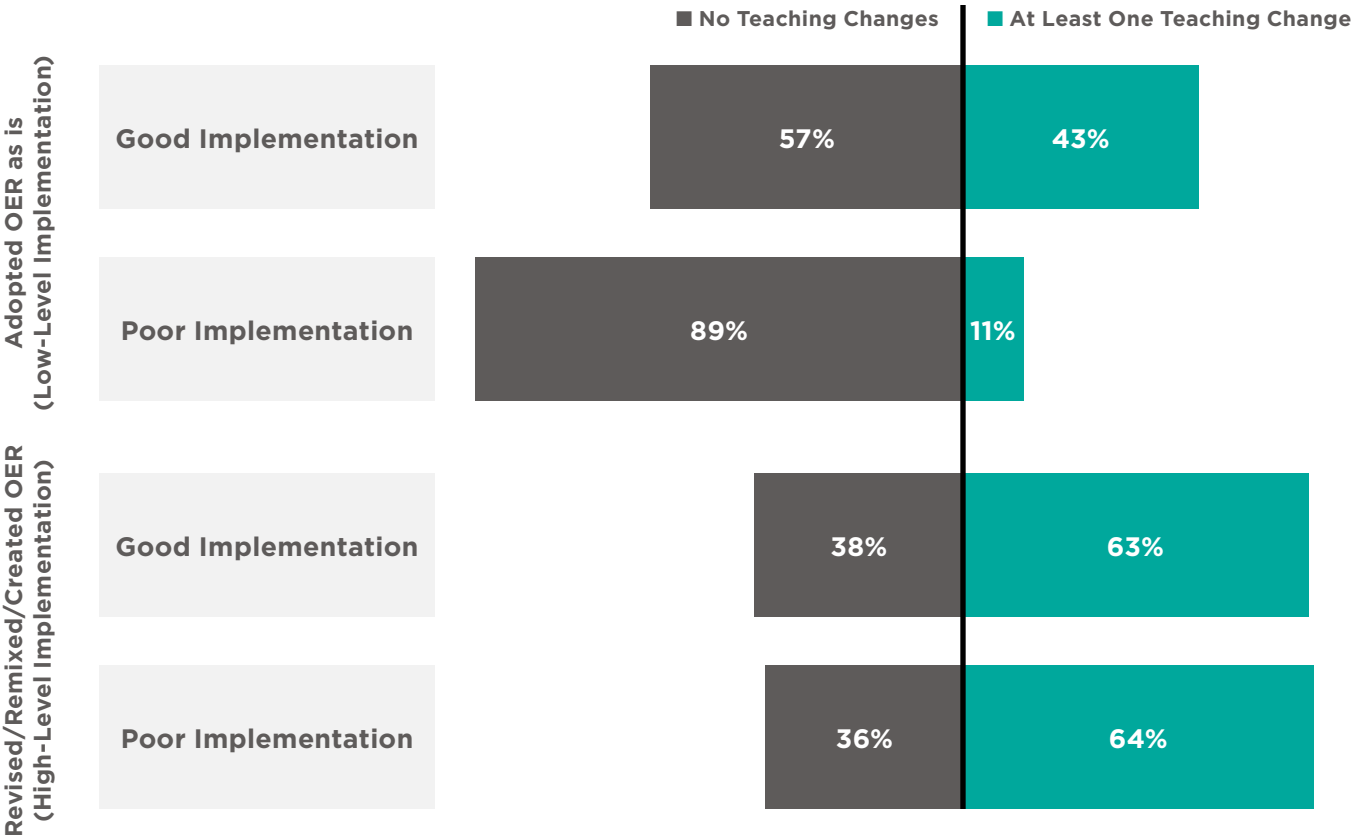
Figure 16: Changes to Teaching Practices After OER Implementation: Overall and by Level of Implementation



Changes to teaching practices based on perceptions of implementation. We further examined changes in teaching practices by level of OER implementation and the instructor's perceived quality of implementation. Those who implemented OER at a lower level and rated their initial implementation as poor were less likely to report subsequent changes to their teaching practices. Many of these instructors also reported external motivations or the aforementioned lack of support. This pattern is consistent with prior literature suggesting that externally motivated engagement tends to yield reduced persistence and diminished investment in the task (Deci & Ryan, 2000).

Among instructors with high-level implementation, however, we did not observe this pattern. The majority of these instructors reported making changes to their teaching practices regardless of whether their initial implementation was perceived as high or low quality. This may reflect the fact that instructors who modify or create OER have already engaged more deeply in aligning course materials with their instructional context and, therefore, may be more open to adopting new teaching practices (Figure 17). The difference between these two groups may further reflect the role of autonomous versus controlled motivation: instructors who undertake the deeper work of revising or creating OER have likely already internalized their reasons for doing so, and that intrinsic orientation may sustain continued pedagogical investment even when initial implementation feels imperfect (Deci & Ryan, 2000).

Figure 17: Changes to Teaching Practices After OER Implementation by Level of Implementation and Perceived Quality of Implementation



KEY TAKEAWAYS

- **One-third of instructors reported making at least one change to their teaching practices following their initial OER implementation, with higher rates among those who revised, remixed, or created OER.**
- **Among those who made changes to their teaching practices, the most commonly reported changes related to course design and active learning strategies.**
- **Instructors who adopted OER and perceived their initial implementation as poor—often associated with external motivations or lack of support—were less likely to make subsequent changes to their teaching practices.**

OER as AAC&U's 12th High-Impact Practice

This study represents the largest examination of OER to date, encompassing nearly 700,000 students across 15 diverse institutions nationwide and including the perspectives of more than 200 faculty engaged in OER implementation.

Our goal was to capture a broad cross-section of higher education in order to better understand the current landscape of OER in the United States, more than two decades after its emergence in 2001. By incorporating multiple institutional contexts and perspectives, we aimed to develop a more comprehensive account of OER's role in teaching and learning.

A consistent finding throughout this study—and one echoed in prior large-scale OER research as well as studies of pedagogical innovation more broadly—is that context matters. OER is not a one-size-fits-all approach. In many cases, its most immediate and consistent benefit is reducing costs for students, a goal that remains both meaningful and widely valued by instructors and institutions. Importantly, OER implementation does not appear to negatively affect student outcomes, reinforcing affordability as an admirable goal and a valid motivation on its own.

That said, there are contexts in which OER implementation is associated with more substantial gains in student success. For example, we observed reductions in course withdrawal rates at doctoral universities and meaningful decreases in time to completion—almost one year—for community college students who took multiple courses with OER and required more than four years to complete their credentials. Moreover, in every context we examined in aggregate, we observed increases in the proportion of students earning A grades following OER implementation.

Based on these findings, we are confident that OER adoption and implementation is a high-impact practice (HIP). Not only is OER associated with positive outcomes for all students but many of our analyses also indicate greater benefits for students with higher levels of CLC, including those who are Pell-eligible, first-generation, part-time, older than 25, and/or from historically underserved racial and ethnic groups. Additionally, OER implementation can have a positive impact on the teaching practices of instructors who participate in high-level implementation. This may be a unique finding among HIPs, as OER implementation is usually initiated at the course level, and thus can occur with or without departmental or institutional support.

RECOMMENDATIONS FOR OER IMPLEMENTATION

As with all HIPs, the effectiveness of OER depends on implementation "done well" (Kuh et al., 2017, p. 12). Because instructors usually bear the burden of OER implementation—unlike many other HIPs that are often institutional initiatives (e.g., study abroad, internships)—it is imperative that the conditions supporting OER implementation are as strong as possible. Our findings show that lack of support and lack of autonomy can negatively shape instructors' perceptions of OER, with potential downstream effects on their teaching practices. Based on these results, we offer the following recommendations for effective OER implementation:

- **Instructor autonomy:** Encouraging instructor autonomy is critical. Administrative mandates may limit academic freedom in selecting course materials appropriate to specific contexts. However, in cases where multi-section courses require standardized materials (including OER), institutions should involve instructors in the selection, development, and review of those materials and actively solicit their feedback.

- **Financial support:** While adopting an OER textbook as a direct replacement may resemble typical textbook selection, revising, remixing, or creating OER requires considerable labor. Even adoption involves effort to ensure alignment with course learning outcomes. Accordingly, OER implementation should be compensated, particularly when contingent faculty are involved.

- **Time support:** A consistent theme in our focus group interviews was the need for additional time to implement OER, yet time support was the least commonly reported form of support. Providing course releases—especially for instructors engaged in extensive revision, remixing, or creation of OER—should become standard.

- **Personnel support**: Access to specialized personnel is essential. For example, OER librarians and other OER specialists can assist with locating and curating materials; instructional designers and center for teaching and learning staff can support alignment with learning objectives, assessments, and backward design; and instructional technologists can help integrate OER into learning management systems. Accessibility offices also play a critical role in ensuring materials meet accessibility standards. A robust support system is key to effective implementation.

- **Professional development:** While individual instructors can successfully implement OER, regular professional development enhances both implementation quality and sustainability. It also conveys a clear sense of buy-in from the institution. Learning communities and mentorship opportunities can foster a sense of community and allow instructors to share best practices within or across their specific institutional or disciplinary contexts. When integrated with broader programming, these efforts may also contribute to shifts in teaching practices and pedagogical approaches.

FINAL THOUGHTS

In a time of declining confidence in the role of higher education in U.S. society, it is imperative that institutions and instructors make their courses as accessible and worthwhile to their students as possible. This includes making them financially accessible by using OER and other free and reduced course materials when possible. It also means ensuring that students have immediate access to course materials on the first day of class, preventing them from falling behind at the outset.

Equally important is the use of course materials that are relevant and appropriate for the needs of the student population. OER makes this possible through the ability to revise, remix, and create course materials that better reflect students' experiences and relevant contexts. When paired with thoughtful instructional practices, these materials can support student success by helping students remain engaged in their courses, persist in their programs, and complete their credentials in a timely manner.

However, achieving these outcomes requires institutional commitment. Meaningful support is required for OER—as with all HIPs—to be done well. Time and financial resources must be allocated not only to instructors implementing OER but also to the support staff needed to make effective OER implementation possible. Without this broader infrastructure, the potential of OER to improve access, equity, and student success cannot be fully realized.

References

Algers, A., & Silva-Fletcher, A. (2015). Teachers' perceived value, motivations for and adoption of open educational resources in animal and food sciences. *International Journal of Emerging Technologies in Learning, 10*(2). https://online-journals.org/index.php/i-jet/article/view/4427

Allen, E. I., & Seaman, J. (2016). *Opening the textbook: Open education resources in U.S. higher education, 2015-16* (pp. 1–75). Babson Survey Research Group. http://www.onlinelearningsurvey.com/reports/openingthetextbook2016.pdf

Allen, G., Guzman-Alvarez, A., Smith, A., Gamage, A., Molinaro, M., & Larsen, D. S. (2015). Evaluating the effectiveness of the open-access ChemWiki resource as a replacement for traditional general chemistry textbooks. *Chemistry Education Research and Practice, 16*(4), 939–948. https://doi.org/10.1039/C5RP00084J

Bates, D., Maechler, M., Bolker, B., & Walker, S. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software, 67*(1), 1–48. https://doi.org/10.18637/jss.v067.i01

Bay View Analytics. (2023). *National survey on student course material affordability, 2023*. Author. https://www.bayviewanalytics.com/reports/student_course_material_affordability.html

Belikov, O. M., & Bodily, R. (2016). Incentives and barriers to OER adoption: A qualitative analysis of faculty perceptions. *Open Praxis, 8*(3), 235–246. https://doi.org/10.5944/openpraxis.8.3.308

Brookhart, S. M. (1991). Grading practices and validity. *Educational Measurement: Issues and Practice, 10*(1), 35–36. http://dx.doi.org/10.1111/j.1745-3992.1991.tb00182.x

Brookhart, S. M., Guskey, T. R., Bowers, A. J., McMillan, J. H., Smith, J. K., Smith, L. F., Stevens, M. T., & Welsh, M. E. (2016). A century of grading research: Meaning and value in the most common educational measure. *Review of Educational Research, 86*(4), 803–848. https://doi.org/10.3102/0034654316672069

Brownell, J. E., & Swaner, L. E. (2010). *Five high impact practices: Research on learning outcomes, completion, and quality*. Association of American Colleges and Universities.

Calcagno, J. C., Crosta, P., Bailey, T., & Jenkins, D. (2007). Stepping stones to a degree: The impact of enrollment pathways and milestones on community college student outcomes. *Research in Higher Education, 48*(7), 775–801. https://doi.org/10.1007/s11162-007-9053-8

Clinton, V., & Khan, S. (2019). Efficacy of open textbook adoption on learning performance and course withdrawal rates: A meta-analysis. *AERA Open, 5*(3). https://doi.org/10.1177/2332858419872212

Choy, S. (2002). *Nontraditional undergraduates* (NCES 2002-012). U.S. Department of Education, National Center for Education Statistics. https://nces.ed.gov/pubs2002/2002012.pdf

Colvard, N. B., Watson, C. E., & Park, H. (2018). The impact of open educational resources on various student success metrics. *International Journal of Teaching and Learning in Higher Education, 30*(2), 262–276. https://www.isetl.org/ijtlhe/pdf/IJTLHE3386.pdf

Crenshaw, K. (1989). Demarginalizing the intersection of race and sex: A Black feminist critique of antidiscrimination doctrine, feminist theory and antiracist politics. *University of Chicago Legal Forum, 1989*(1), 139–167. https://chicagounbound.uchicago.edu/uclf/vol1989/iss1/8/

Crisp, G., Taggart, A., & Nora, A. (2015). Undergraduate Latina/o students: A systematic review of research identifying factors contributing to academic success outcomes. *Review of Educational Research, 85*(2), 249–274. https://doi.org/10.3102/0034654314551064

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*(4), 227–268. https://doi.org/10.1207/S15327965PLI1104_01

Diaz Solodukhin, L., MacDonald, M., Falkenstern, C., Lane, P., & Jones, K. (2025). No-cost/low-cost and oer impact on time-to-credential: An event history modeling study. *Journal of Open Educational Resources in Higher Education, 3*(1). https://doi.org/10.31274/joerhe.17772

Donaldson, R., Opper, J., & Shen, E. (2019). *2018 student textbook and course materials survey: Results and findings*. Florida Virtual Campus. https://dlss.flvc.org/research

Engler, J. N., & Shedlosky-Shoemaker, R. (2019). Facilitating student success: The role of open educational resources in introductory psychology courses. *Psychology Learning & Teaching, 18*(1), 36–47. https://doi.org/10.1177/1475725718810241

Engle, J., & Tinto, V. (2008). *Moving beyond access: College success for low-income, first-generation students*. Pell Institute for the Study of Opportunity in Higher Education. https://www.pellinstitute.org/resources/moving-beyond-access-college-success-for-low-income-first-generation-students/

REFERENCES

Finley, A., & McNair, T. (2013). *Assessing underserved students' engagement in high-impact practices*. Association of American Colleges and Universities. https://dgmg81phhvh63.cloudfront.net/content/user-photos/Publications/PDFs/E-VALRUBRIC.pdf

Fischer, L., Hilton, J., III, Robinson, T. J., & Wiley, D. A. (2015). A multi-institutional study of the impact of open textbook adoption on the learning outcomes of post-secondary students. *Journal of Computing in Higher Education, 27*(3), 159–172. https://doi.org/10.1007/s12528-015-9101-x

Glaser, B., & Strauss, A. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Sociology Press.

Griggs, R. A., & Jackson, S. L. (2017). Studying open versus traditional textbook effects on students' course performance: Confounds abound. *Teaching of Psychology, 44*(4), 306–312. https://doi.org/10.1177/0098628317727641

Grissett, J. O., & Huffman, C. (2019). An open versus traditional psychology textbook: Student performance, perceptions, and use. *Psychology Learning & Teaching, 18*(1), 21–35. https://doi.org/10.1177/1475725718810181

Gurung, R. A. R. (2017). Predicting learning: Comparing an open educational resource and standard textbooks. *Scholarship of Teaching and Learning in Psychology, 3*(3), 233–248. https://doi.org/10.1037/stl0000092

Herbert, M. J., Clinton-Lisell, V., & Stupnisky, R. H. (2023). Faculty motivation for OER textbook adoption and future use. *Innovative Higher Education, 48*(2), 371–388. https://doi.org/10.1007/s10755-022-09625-6

Hilton, J. (2016). Open educational resources and college textbook choices: A review of research on efficacy and perceptions. *Educational Technology Research and Development, 64*(4), 573–590. https://doi.org/10.1007/s11423-016-9434-9

Hofer, A. (2025, October 21). Strong design, strong outcomes: Instructional design support makes a difference. *Openoregon.org*. https://openoregon.org/strong-design-strong-outcomes-instructional-design-support-makes-a-difference/

Hollister, C. V., & Patton, J. (2022). Faculty perceptions of an OER stipend program. *New Review of Academic Librarianship, 28*(4), 435–453. https://doi.org/10.1080/13614533.2021.2000452

Hurtado, S., Alvarez, C. L., Guillermo-Wann, C., Cuellar, M., & Arellano, L. (2012). A model for diverse learning environments. In J. C. Smart & M. B. Paulsen (Eds.), *Higher education: Handbook of theory and research* (Vol. 27, pp. 41–122). Springer. https://doi.org/10.1007/978-94-007-2950-6_2

Jhangiani, R., Pakkal, O., & Xia, X. (2025). The multi-year impact of Canada's first zero textbook cost initiative. *Open Praxis, 17*(2), 326–348. https://doi.org/10.55982/openpraxis.17.2.832

Jhangiani, R., Pitt, R., Hendricks, C., Key, J., & Lalonde, C. (2016). *Exploring faculty use of open educational resources in B.C. post-secondary institutions* [White Paper]. BCcampus. https://bccampus.ca/2016/01/27/exploring-faculty-use-of-open-educational-resources-in-b-c-post-secondary-institutions/

Kimball, R., Halling, D., Neville, B., & Herbert, B. (2022). Motivations and barriers in the adoption of OERs: The role of subject librarians. *Journal of Academic Librarianship, 48*(4), Article 102542. https://doi.org/10.1016/j.acalib.2022.102542

Kuh, G. D. (2008). *High-impact educational practices: What they are, who has access to them, and why they matter.* Association of American Colleges and Universities. https://dgmg81phhvh63.cloudfront.net/content/user-photos/Publications/PDFs/E-HIGHIMP.pdf

Kuh, G. D., Kinzie, J., Buckley, J. A., Bridges, B. K., & Hayek, J. C. (2006). *What matters to student success: A review of the literature*. National Postsecondary Education Cooperative/NCES.

Kuh, G., O'Donnell, K., & Schneider, C. G. (2017). HIPs at ten. *Change: The Magazine of Higher Learning, 49*(5), 8–16. https://doi.org/10.1080/00091383.2017.1366805

Krueger, R. A., & Casey, M. A. (2015). *Focused groups: A practical guide for applied research* (5th ed.). Sage.

Lantrip, J., & Button, M. (2025). Comparing a faculty-created OER and commercial textbook: Student outcomes and perceptions. *Open Praxis, 17*(3), 561–578. https://doi.org/10.55982/openpraxis.17.3.897

Lazzara, J. (2024). The connection between course materials and teaching approaches. *Open Learning*. Advance online publication. https://doi.org/10.1080/02680513.2024.2415323

LeMire, S. (2025). Faculty barriers to using open educational resources. *Open Learning*. Advance online publication. https://doi.org/10.1080/02680513.2025.2573338

Mayer, J. (2023). Open educational resources (OER) efficacy and experiences: A Mixed methods study. *Portal: Libraries and the Academy, 23*(4), 773–798. https://doi.org/10.1353/pla.2023.a908701

McKinney, A. (Ed.). (2024). *Valuing OER in the tenure, promotion, and reappointment Process*. DOERS3. https://pressbooks.cuny.edu/tenureandpromotioncasestudies/

McNeish, D. M., & Stapleton, L. M. (2016). The effect of small sample size on two-level model estimates: A review and illustration. *Educational Psychology Review, 28*, 295–314. https://doi.org/10.1007/s10648-014-9287-x

Medley-Rath, S. (2018). Does the type of textbook matter? Results of a study of free electronic reading materials at a community college. *Community College Journal of Research and Practice, 42*(12), 908–918. https://doi.org/10.1080/10668926.2017.1389316

Miao, F., Mishra, S., Orr, D., & Janssen, B. (2019). *Guidelines on the development of open educational resources policies*. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000371129

REFERENCES

Museus, S. D., & Griffin, K. A. (2011). Mapping the margins in higher education: On the promise of intersectionality frameworks in research and discourse. *New Directions for Institutional Research, 2011*(151), 5–13. https://doi.org/10.1002/ir.395

Nascimbeni, F., & Burgos, D. (2019). Unveiling the relationship between the use of open educational resources and the adoption of open teaching practices in higher education. *Sustainability, 11*(20), Article 5637. https://doi.org/10.3390/su11205637

Pascarella, E. T., & Terenzini, P. T. (1991). *How college affects students: Findings and insights from twenty years of research*. Jossey-Bass.

Pascarella, E. T., & Terenzini, P. T. (2005). *How college affects students, Vol. 2: A third decade of research*. Jossey-Bass.

Paskevicius, M., & Irvine, V. (2021). Learning to be open: Instructor growth through open pedagogy. *Open Learning, 36*(3), 294–310. https://doi.org/10.1080/02680513.2021.1970520

R Core Team. (2026). R: A language and environment for statistical computing (Version 4.5.1) [Computer software]. R Foundation for Statistical Computing. https://www.R-project.org/

Robinson, T. (2015). *The effects of open educational resource adoption on measures of post-secondary student success* (Publication No. 5815) [Doctoral dissertation, Brigham Young University, Provo]. Scholars Archive. https://scholarsarchive.byu.edu/etd/5815

Smith, N. (2022). OER funding models and the labor theory of value. *Open Texas conference proceedings*. Texas Digital Library. https://tdl-ir.tdl.org/items/41f4b360-5e94-40c5-9469-adfc2e4f2c3b

Spencer, C., Angra, A., Dósa, K., & Jones, A. (2025). Undergraduate learning gains and learning efficiency in a focused open education resource. *International Review of Research in Open and Distributed Learning, 26*(2), 184–204. https://doi.org/10.19173/irrodl.v26i2.8117

Squibb, S. D., Salmon, E., & Yan, Y. (2023). Measuring the impact of an open educational resource and library e-resource adoption program using the COUP framework. *International Review of Research in Open and Distributed Learning, 24*(4), 80–101. https://doi.org/10.19173/irrodl.v24i4.7420

Terenzini, P. T., Springer, L., Yaeger, P. M., Pascarella, E. T., & Nora, A. (1996). First-generation college students: Characteristics, experiences, and cognitive development. *Research in Higher Education, 37*(1), 1–22. https://doi.org/10.1007/BF01680039

Valentine, J., Price, D., & Yang, H. (2021). *High-impact practices and gains in student learning: Evidence from Georgia, Montana, and Wisconsin* (Lumina Issue Paper). Lumina Foundation.

Valle, P. H. D., Capilla, R., Santos, V. D., Feitosa, D., & Nakagawa, E. Y. (2026). *Open educational resources: Barriers and open issues*. arXiv. https://doi.org/10.48550/arXiv.2603.10013

Vitez, K. (2018). *Open 101: An action plan for affordable textbooks*. Student Public Interest Research Groups. https://studentpirgs.org/2018/01/25/open-101-action-plan-affordable-textbooks/

Vojtech, G., & Grissett, J. (2017). Student perceptions of college faculty who use OER. *International Review of Research in Open and Distributed Learning, 18*(4), 155–171. https://doi.org/10.19173/irrodl.v18i4.3032

Weller, M., de los Arcos, B., Farrow, R., Pitt, B., & McAndrew, P. (2015). The impact of OER on teaching and learning practice. *Open Praxis, 7*(4), 351–361.

Wiley, D. (2014, March 5). The access compromise and the 5th R. *Improving Learning*. https://opencontent.org/blog/the-access-compromise-and-the-5th-r/

Xie, D. (2026). *Fixing the broken textbook market* (4th ed.). Student PIRGs. https://studentpirgs.org/2026/02/10/fixing-the-broken-textbooks-market-fourth-edition

www.aacu.org