Participant Experiences and Financial Impacts:

Findings from Year 2 of Achieving the Dream's OER Degree Initiative

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SRI Education™
A DIVISION OF SRI INTERNATIONAL

Achieving the Dream™

rpk GROUP
from mission to market

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Preface

Participant Experiences and Financial Impacts: Findings from Year 2 of Achieving the Dream's OER Degree Initiative

ATD's OER Degree Initiative comprises teams from 38 colleges from across the U.S. who are part of one of the most ambitious OER projects to date: to build OER degree pathways using openly licensed course materials in place of proprietary textbooks. Our approach is unique, but it makes this work challenging. Most OER efforts are single-faculty, single-course efforts that are not connected. By requiring colleges to build full and aligned OER degree pathways, connection and scale are built-in from the start, an ingredient we learned must be part of any reform design to move the completion needle. We see the enormous potential of OER when we strategically design efforts with students at the center and intentionally connect them to our organizational strategies or strategic plans to improve access and completion.

Achieving the Dream, in partnership with SRI, is pleased to share this second in-depth research report on the Open Educational Resources (OER) Degree Initiative, with funding support from The William & Flora Hewlett Foundation, the Bill & Melinda Gates Foundation, Great Lakes Higher Education Corporation & Affiliates, and the Speedwell and Shelter Hill Foundations. This report is the result of a parallel research and evaluation study of the initiative, led by SRI Education and rpk GROUP, that over the course of the project is intended to answer the following questions:

- How do colleges best implement OER degree paths?
- What are the real costs of implementation?
- How much money do students actually save?
- And importantly, what are the academic outcomes for students who enroll in these courses?

This report expands on last year's report with updated course and enrollment data as well as new findings about students' perceptions of their OER courses and the institutional costs and actual student savings of OER degree pathways. A final report in September 2019 will include findings on student and course outcome data. Here are several highlights from this report that caught our attention:

- The Initiative has spurred significant expansion of OER courses and enrollments at participating colleges.
- Students find OER materials more relevant, easier to navigate, and better aligned with learning objectives than traditional textbooks.

- Faculty see increased student engagement with OER materials.
- College leaders see OER degrees connected to other institutional strategic goals, including affordability, increased access and equity, decreased time to degree, and improved pedagogy.
- Students realize significant savings from use of free and open course materials, savings that can help them with financial challenges that might interfere with their ability to continue and succeed in their program of study.

ATD believes that OER degree pathway implementation can contribute to transformational institutional change, particularly when linked to other capacity building efforts. The findings in this second report provide support for this belief as the foundational institutional change work completed by many ATD network colleges in this initiative have helped them scale their OER pathways more effectively. At many of colleges, adoption of OER is spreading beyond clear issues of student affordability to the less obvious issues of access, completion, reducing time to degree, decreasing debt, advancing equity, and rethinking pedagogy, setting into motion policy, funding and systems change at the institutional, state and federal level. We continue to learn from our colleges about what works and what doesn't, including what supports colleges will need to build sustainable OER programs. We look forward to sharing more findings as this project continues.

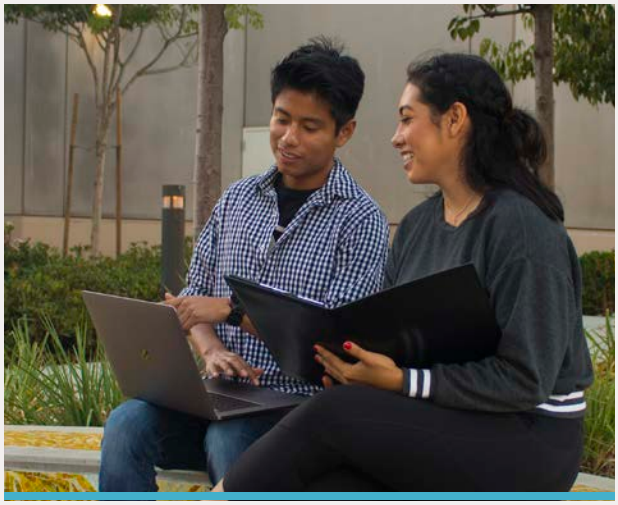
We hope you find this report useful as you consider the important role of Open Educational Resources can play in fostering better and more affordable learning for all students.

Sincerely,

Dr. Karen A. Stout
President & CEO
Achieving the Dream, Inc.

Executive Summary

This report presents research findings from the second year of the Achieving the Dream Open Education Resources (OER) Degree Initiative, which is intended to help colleges reduce the financial burden on students and improve curriculum and pedagogy by developing course pathways using free and openly licensed instructional materials. This initiative involves 38 community colleges across the United States, including consortia of colleges in four states, and is supported by funding from five foundations.



SRI International, along with partner rpk GROUP, is conducting the research and evaluation for the initiative, investigating the impacts of OER degree pathways on student success, economic impacts on students and institutions, and facilitators and barriers to implementation of this model. Achieving the Dream (ATD) also partnered with Lumen Learning to provide technical assistance to grantees and the Community College Consortium of Open Education Resources (CCCOER), which facilitates a community of practice.

Colleges began rolling out their OER degree classes as early as fall 2016 with the aim of offering complete course pathways by the end of 2018. This report builds on a formative implementation report, *Launching OER Degree Pathways: An Early Snapshot of Achieving the Dream's OER Degree Initiative and Emerging Lessons*, released in summer 2017,[1] adding to our understanding of what it takes for colleges to launch and sustain OER degree pathways and the costs involved. This year we are also able to present new insights into how OER degree courses affect students' experiences and share their firsthand perspectives. Finally, we consider the extent to which evidence suggests that colleges are achieving their strategic goals for launching OER degrees.

1 Griffiths, R., Mislevy, J., Wang, S., Shear, L., Mitchell, N., Bloom, M., Staisloff, R., & Desrochers, D. (2017). *Launching OER Degree Pathways: An Early Snapshot of Achieving the Dream's OER Degree Initiative and Emerging Lessons.* Menlo Park, CA: SRI International. Available at https://www.achievingthedream.org/sites/default/files/initiatives/launching_oer_degree_pathways.pdf

The findings presented here are based on following data and analyses:

- OER course data collected from 32 colleges after the fall 2016, spring and fall 2017, and spring 2018 terms detailing the number of students who enrolled in and completed OER degree courses.
- A student survey administered at 12 colleges in October–December 2017 in a sample of OER courses. SRI received a total of 2,441 completed surveys, with an overall response rate of 41%.
- Site visits in fall 2017 and spring 2018 at 11 colleges included interviews with instructors and administrators involved with the OER degree initiative, focus groups of students enrolled in OER courses, and observations of OER classes.
- Cost data collected from up to 33 colleges after the fall 2016, spring and fall 2017, and spring 2018 terms (not all colleges submitted data each term). These data sets contained information on institution-wide enrollment and OER offerings, bookstore revenue, textbook sales, OER fees, and cost of attendance. Additionally, data collected from five "cost partner" colleges provided more information on the costs associated with developing OER courses and an OER pathway.

These data provided an emerging picture of the scale of the OER degree initiative, implementation processes, the experiences of key stakeholders, costs and benefits, and progress in establishing the conditions necessary for sustaining these programs.

What has the ATD OER Degree Initiative Achieved So Far?

The ATD initiative has generated a substantial volume of new OER course offerings, affecting tens of thousands of students. From fall 2016 to spring 2018, grantee colleges offered a total of 2,946 sections of 385 OER courses. All courses had to be certified by Lumen Learning. This represents a significant increase from fall 2016, when just 13 certified OER courses were offered. Total student enrollment in OER degree courses in 2017 was 37,398, a more than tenfold growth from the prior year's enrollment of 3,404. Enrollment more than doubled from spring 2017 (9,882) to fall 2017 (23,765).[2]

Aggregate cost savings to students during the first 2 years of the grant, from fall 2016 through spring 2018, were estimated to be between $6.5 million and $12 million, with the lower figure factoring in student textbook purchasing behavior. The conversion of courses to OER results in direct cost saving to students, who are relieved of the requirement to purchase proprietary textbooks. Our estimates account for typical purchasing behavior (i.e., that many students buy lower cost used textbooks or rent textbooks) and for the access fees that some colleges charge for OER courses. These savings are expected to increase as certified OER courses and enrollments continue to grow in fall 2018.

How Do OER Degrees Affect Students?

The cost of traditional textbooks is a burden for students and can account for up to 80% of the cost of college attendance for Pell or other grant aid recipients. On the survey, 53% of students reported either not purchasing or renting the required materials for a course on at least one occasion, and of those 45% said they did so because they could not afford the materials. While only 12% of students reported that they have withdrawn from a course because they could not afford required materials, 41% responded that OER courses have a significant impact on their ability to afford college. Students who work more than 20 hours per week were more likely to have withdrawn from a course or stopped taking courses for a semester or more due to costs.

Students planned to use cost savings from OER courses toward other education expenses. Half the students surveyed reported that they would use their savings to cover college tuition and/or fees. Other common uses were covering personal expenses, purchasing materials or supplies for other courses, and taking additional courses. Relatively few students said they would use savings to reduce their work hours.

Both survey and focus group data indicated **that student awareness of OER courses and especially degree pathways was low, suggesting that students who could benefit most from this initiative may not have been taking advantage of it.** A substantial proportion of students learned that their courses were OER after enrolling. Students

2 The total for 2017 also includes winter and spring sessions.

most often learned about OER courses from an instructor or advisor or from the course syllabus. Relatively few students heard about them from other students or from the college website, suggesting that at most of the colleges OER was not yet well integrated into systems and peer dialogue. Students who work more than 20 hours per week were less likely to be aware of other OER courses offered by their campuses.

Students appreciated the ease of accessing OER course materials and had positive views about the quality of the materials and course experience. In focus groups students commented that OER materials are available without delay and that the online format offers greater flexibility and transportability. Additionally, students found OER materials more relevant, easier to navigate, and better aligned with learning objectives than textbooks. Most students did not have problems accessing or using OERs. Although 62% responded on the survey that access to technology and/or the internet impacts their ability to complete coursework, fewer than 10% cited this as a challenge for OER courses.

Overall, students gave OER very positive ratings for quality and student engagement, and the vast majority said they wish to take additional OER courses and would recommend them to friends.

What Does It Take to Launch an OER Degree?

We explored what it takes for a college to launch an OER degree pathway based on findings from site visit interviews. These findings also build on some themes identified in the 2017 report, which examined the instructor experience in greater depth. Note that while we have multiple stakeholder perspectives from a sample of colleges, we cannot assume their experiences generalize across all grantees.

OER degree initiatives often originated from grassroots faculty adoption. In most cases, faculty members pioneered use of OER on their campuses, and then many went on to serve as champions and mentors to scale up activities. Librarians, teaching and learning center staff, and technology staff played a key role in introducing OER to their campuses at 4 out of the 11 colleges. At a few colleges, administrators drove the decision to launch OER degrees, but they were usually building off existing OER activity. Students at some colleges had advocated for textbook affordability, and in several cases were actively involved in OER initiatives, for example conducting student surveys about affordability at one college.

In selecting which degree to target, most colleges prioritized scale of potential impact, followed by feasibility and degree of faculty interest. Often the selection of degree pathways started with an inventory of what OER courses were already offered.

Recruiting a broader base of faculty to develop and teach OER courses is a central challenge given the time required, concerns about availability of appropriate content, and in some cases resistance to change. Converting the 20

courses that are usually required for a degree pathway entails a concerted effort to recruit instructors and provide them with the necessary supports for course redesign. Although the availability of OER course content has expanded substantially in recent years, some faculty members continued to be skeptical that it is of high quality and reliable. Instructors reported that certain types of OER materials, such as images, are especially hard to find. Stipends typically covered only a fraction of the time needed for this work, meaning instructors needed to redirect time from other activities or use personal time. Academic freedom was also a concern even among enthusiasts, and some instructors worried about giving up control over their intellectual creations.

Most colleges developed at least some of their own course materials, often involving collaborations among faculty, and three produced entire textbooks. We found numerous examples of collaboration on course development and sharing of content. Instructors involved in developing OER courses cited the benefits of participating in a community of practice. OER courses were usually subject to the same review processes as other non-OER courses, aside from Lumen Learning certification (a requirement of the ATD grants).

Sharing of entire courses poses operational as well as cultural challenges. Operationally, some instructors were not aware of a repository for sharing courses with colleagues at their institutions, or elsewhere. Lumen Learning was cited as a mechanism for disseminating courses, but some instructors expressed concerns about how their courses would be used. Culturally, instructors appear to perceive more risks than benefits to sharing their courses, perhaps due to confusion about whether they would be credited for their work once it is openly licensed.

The course development burden could be mitigated with support from libraries, instructional designers, and other teaching and learning staff. Most colleges offered support from information technology (IT), instructional designers, instructional technologists, and OER coordinators, but instructors were not always aware of these resources. Supports provided for course design and technology implementation were typically general rather than OER-specific. Supports faculty members accessed for OER course development typically pertained to copyright clearance and compliance with grant licensing requirements. Librarians at a few colleges were available to support copyright clearance and content discovery and vetting, but instructors may have underutilized this resource.

Practices for communicating about OER degree courses to students were still emerging and generally were not targeted to particular students. Tagging courses in the online catalogue was a high priority and was still in progress at four out of eleven sites. Of the others, some tagged courses as OER and some tagged them as zero cost (one college had tags for both OER and zero cost courses). Advisors were also seen as a key point of contact for directing students to OER courses, although some had not yet been informed about the initiative. Some interviewees cited word of mouth as an important way to increase awareness, but the student survey findings indicated that relatively few students learned about OER courses from other students or from the college website.

Costs of implementing OER degrees extended well beyond funding for faculty stipends. Approximately one-third of expenditures were for general support and administration, and about two-thirds directly funded development of OER courses. Stipends and release time covered only

about 20% of the time instructors reported spending on course development. The development cost per course averaged $11,700, but this rose to $18,200 for courses developed by teams of instructors. One area where financial impacts were smaller than expected was lost revenue from bookstore commissions/profits, which were estimated to average $14,000 per institution during the two years of the grant. Overall, the five cost partner colleges contributed more than 20% of the budgeted resources, averaging $269,000 over two years, for their programs. However, when combined with the unbudgeted faculty and staff time that was reallocated to OER activities, the cost partners supported nearly 60% of the degree pathway development costs, which averaged $494,000 over the two years of the grant.

Colleges identified multiple strategic goals advanced by OER degrees, including affordability, greater access and equity, improved curriculum and pedagogy, and decreased time to degree. Evidence suggests that OER degrees are addressing at least some of these goals:

- *Affordability* - On average, students save between $66 and $121 per course, with the lower number factoring in students' typical purchasing behavior. As noted, 41% of students reported that OER degrees would affect their ability to afford college.
- *Increased access and equity* - Students who received Pell Grants constituted an estimated 43% of overall enrollment in OER courses. The share of students who said that OER degrees will have a significant impact on their ability to afford college was higher for Pell Grant recipients and underrepresented minorities. Similarly, the share of students who said they have had to drop a course because they could not afford required materials was higher for minorities, 17% of underrepresented minorities versus 12% for all students.
- *Improved curriculum and pedagogy* - A number of instructors reported that, with OER, they better aligned course materials with learning objectives and were more intentional about assignments. Faculty members at almost all colleges reported greater student engagement because of the use of more contemporary and relevant materials. Students mirrored their reports, saying the OER materials were better aligned with course outcomes and more engaging. In most cases, however, teachers did not report that their existing pedagogical practices changed substantially with OER.
- *Decreased time to degree* – It is too soon to know whether students who take multiple OER courses progress more quickly and successfully. While some instructors saw signs of increased engagement, they generally did not claim to see differences in course outcomes. Few students said they were likely to perform better in OER courses. In the coming year SRI will analyze impacts on academic outcomes associated with OER degree courses and will be able to shed more light on how these pathways effect progress to degree.

In most cases the relationship between OER and other strategic initiatives was expressed at a high level (e.g., "affordability") but had not yet been translated into operational connections, such as targeting communications about OER to students who receive financial assistance or to advisors.

What Will It Take to Sustain OER Degrees?

Sustaining OER degrees will entail having a plan to cover financial costs, enacting supportive policies and practices, and developing key elements of an OER culture among faculty and administrators.

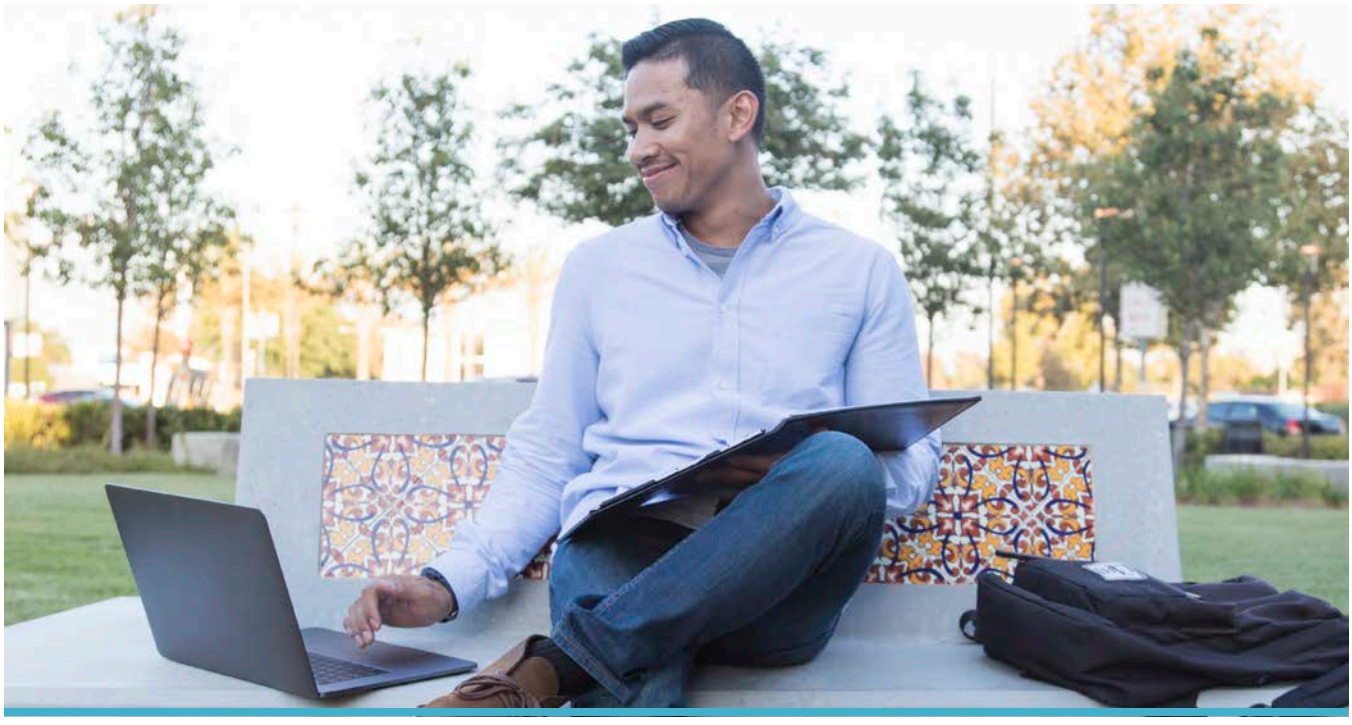
- **Resources:** Ongoing costs include instructor time for updating and developing OER courses and provision of other supports and coordination. Colleges are considering sources of funding such as OER course access fees or existing technology or online fees. In addition, resources within the existing budget–people, time, and dollars–can be reallocated to support OER. Conversely, course development and delivery costs might be reduced through various efficiency measures, such as using librarians to search for OER materials and leveraging OER courses that have already been developed for use by other instructors.
- **Infrastructure:** Sustaining OER programs requires an organized approach to learning supported by a coordinated set of policies, processes, and standards. For example, tagging OER courses in online catalogs and including OER in job descriptions are important steps. Grantees have made significant progress putting this foundation in place over the past 2 years. Sustaining progress will most likely require administrative oversight to ensure policies are updated and implemented in the future and to continue instructor recruitment.
- **Culture:** Developing an OER culture is critical to sustainability, just as sustaining OER initiatives over time may lead to deeper cultural changes in favor of student-centered instruction and content sharing. One indicator of culture change is whether adoption has spread among faculty members beyond innovators to a broader circle (early adopters or early majority).[3] Culture shifts may also take root as connections are formed with other student success initiatives. In most cases OER initiatives seemed to advance existing goals, such as student-centered pedagogy, rather than be the catalyst of them.

An important question surfaced in the evaluation is how colleges think about sustaining OER *courses* versus OER *degrees*. Pursuing degree pathways offers a number of benefits, such as setting an ambitious point on the horizon to galvanize collective action, providing an organizing framework for previously disparate activities, and developing branded programs that can attract students. On the other hand, some colleges may find entire degree pathways difficult to sustain and determine instead that they can optimize impact through other OER strategies, such as focusing on large-enrollment gateway courses.

3 These terms come from Everett Rogers' diffusion curve, a widely used framework for examining adoption of innovations. Rogers, E. M. (2003). *Diffusion of innovations.* New York: Free Press.

Looking Forward

Grantees aim to complete the roll out of OER degree pathways in fall 2018, which is the final term of the ATD program. The last 2 years of research have provided a detailed picture of what it takes to launch an OER degree, the experiences of those involved, and the steps colleges should take to sustain and build on this progress. In the last year of the project SRI and rpk GROUP will conduct an additional cycle of data collection and another iteration of the instructor survey. The latter will help us to gauge whether the population and diversity of participating instructors has grown and how their perspectives on OER degrees have evolved since 2016. We will also conduct quasi-experimental studies with research partners to examine the academic impacts of OER degrees and, in conjunction with additional cost analyses, the cost-effectiveness of this model. A final report will be released in fall 2019.



Introduction

The Open Education Resources (OER) Degree Initiative was launched by Achieving the Dream (ATD) in 2016 to help colleges eliminate the financial burden instructional materials place on many students and to promote improvements in curriculum and pedagogy. The initiative provides funding and support for grantees to create entire degree pathways–typically at least one section of at least 20 courses–that use only freely available and openly licensed content. The ATD initiative is distinguished by its scale, involving 38 community colleges across 13 states, and by its potential to contribute to the availability of OER courses. It also offers an opportunity to generate new evidence about how OER adoption at scale affects students and institutions, the costs and benefits, and what it takes to ramp up and sustain these pathways.

The 2017 formative implementation report[4] provides additional background on the OER movement, the ATD initiative, and the participating institutions.

The research and evaluation of the OER Degree Initiative are addressing the following questions:

Academic outcomes

- Do students who take OER degree classes make greater progress toward degrees compared with similar students who take traditional classes?
- Are OER degrees more or less beneficial to particular subgroups of students (e.g., Pell Grant eligible)?
- What are the key moderators of effects on student outcomes; for example, do students in OER degree classes work fewer hours outside school, and are they then able to focus more time on school work?

Economic outcomes

- What does it cost an institution to create OER degree pathways, including both start-up costs and lost revenue streams? Is this model sustainable?
- What is the cost-effectiveness of this model in terms of cost per desired unit of impact on student outcomes?
- How does enrolling in OER degree courses impact costs for students?

Implementation

- How many students and other stakeholders are impacted by the OER Degree Initiative?
- What are best practices, facilitators, and barriers associated with implementation of OER degrees?
- What impacts do OER degrees have on key stakeholders' experiences and on institutional culture?

4 Griffiths, R., Mislevy, J., Wang, S., Shear, L., Mitchell, N., Bloom, M., Staisloff, R., & Desrochers, D. (2017). Launching OER Degree Pathways: An Early Snapshot of Achieving the Dream's OER Degree Initiative and Emerging Lessons. Menlo Park, CA: SRI International.

This report presents findings from data collected during the 2016/17 and 2017/18 academic years. The research team fielded a student survey, conducted site visits, and collected data on OER course enrollment and institutional costs. The intent was to provide stakeholders with a detailed picture of how the initiative is unfolding. We hope it will also provide others with an interest in OER initiatives–policymakers, administrators, and faculty members–with an understanding of the steps needed to launch initiatives of this scale.

The 2017 formative implementation report provided extensive information on the colleges and instructors participating in this initiative. It described instructors' perspectives, challenges, and needs based on survey data and phone interviews. This report emphasizes the student perspective on the financial impacts of traditional textbooks; their experiences in and awareness of OER courses, and how this model affects their ability to afford college. In addition, it describes barriers and facilitators to implementing OER degrees from the institutional perspective.

The report begins with an overview of data collections conducted thus far, followed by findings and reflections. The findings are organized in four sections.

1. Presented first is the progress of OER degree implementation as of spring 2018, including the number of courses and sections offered, the number of students enrolled, and the aggregate cost savings to students associated with the initiative.
2. The second section explores the student perspective of OER courses and degrees based on the survey and focus groups. This section includes an analysis of the cost impacts on students using data collected from the survey and cost templates.
3. Third, we examine the rollout of OER degrees at the instructor and institution levels, revisiting some of the themes that surfaced in the 2017 formative implementation report, and we present an analysis of the costs of implementing OER degrees.
4. Finally, we reflect on the sustainability of OER degree pathways and the financial, infrastructure, and cultural elements required to maintain progress after the grant period.

The report concludes with a brief summary of evidence suggesting that the colleges are making progress toward at least some of their strategic goals and a look ahead at the final year of the grant.

At this stage of the evaluation we are able to report in more depth on what it takes to launch an OER degree and the experience of key stakeholders involved in developing these degrees. A more defined picture is emerging of the conditions necessary for sustaining OER degree pathways and the colleges' progress in creating these conditions. The economic impacts on students and institutions associated with this initiative are also becoming clear. Yet to be determined are the academic impacts of the initiative on student progress to degree and thus the cost-effectiveness of this model. These research questions will be addressed in a final report, scheduled to be released in September 2019, once remaining data collection and quasi-experimental studies with research partners have concluded.

Described here are the data collections and analysis undertaken during the second year of the project, the 2017/2018 academic year.

Data Collections and Analysis

OER Course Offerings and Enrollment

To track the development of the OER degree pathways, SRI collected section-level data on the OER degree pathway courses offered at each college, including instructor; course details (format, start and end dates, credit value); the number of students who enrolled, withdrew, and completed with a C- or above; and estimates of the number of Pell Grant recipients who enrolled, withdrew, and completed with a C- or above.[5] So far we have collected 98 reports of these data following the fall 2016, spring 2017, fall 2017, and spring 2018 terms. Response rates have ranged from 76-100%.

Fall 2017 Student Survey

During fall 2017 SRI administered an online student survey with a subset of 12 colleges, which were selected to be representative of diverse geographic locations (rural, urban, and suburban) and degree types. The purpose of the survey was to collect information on:

- students' motivations for and awareness of enrolling in OER sections;
- impact on student costs, potential moderating factors such as hours of work outside class, and decisions about how many courses to take; and
- students' perceptions of the quality of the educational experience and instructional materials compared with other educational experiences.

A total of 2,441 student responses were collected across the 12 colleges (Table 1). The overall response rate was 41%, with individual college response rates ranging from 17% to 78%. Given that this response rate fell short of our target of 60%, and was much lower at some colleges, results should be considered suggestive rather than representative of the entire population. Where possible we asked that instructors administer the survey during class time to promote higher response rates. Colleges with online-only courses tended to have lower response rates than those with face-to-face courses. For a more detailed

Table 1: OER Student Survey Grantees and Survey Response Rates

Colleges (12)	Survey Responses	Response Rate (%)
A	284	53
B	162	25
C	246	38
D	73	17
E	139	24
F	226	42
G	111	53
H	359	77
I	119	21
J	169	52
K	348	78
L	205	34
Total	**2,441**	**41%**

5 To be included in reporting for the ATD initiative, all OER courses must be certified by Lumen Learning as meeting the grant requirements for open licensing.

description of sampling and analysis methods, see Appendix A. Complete results from the survey are available in Appendix B.

The average age of students participating in the survey was 24, and approximately one-third of them were in their first year of college (Table 2). More than half of the students were enrolled full time, while almost 30% worked 30 or more hours per week. Thirty-seven percent of respondents received Pell Grants, including 47% of underrepresented minorities.

Site Visits

SRI conducted 2-day site visits to 11 grantees during fall 2017 and spring 2018. During the site visits we interviewed administrators (51 total, including service unit leaders), instructors (25 total), and groups of students (68 students total). We also conducted 16 classroom observations. The following research questions were addressed in the site visit data collection:

- How does enrolling in OER degrees affect costs for students of pursuing degrees?

Table 2: Background Information on Participating Students

Respondent Characteristics: Demographics and Enrollment						
Average age	24 years					
Gender (%)	Female: 64		Male: 35		Other: 2	
Employment (%)	Full time: 27		Part time: 46		Not employed: 27	
Semesters completed (%)	1 or fewer: 33		2 to 3: 32		4 or more: 35	
Current credit load (%)	5 or fewer: 13		6–11: 32		12 or more: 56	
Respondent Characteristics: How Students Pay Tuition (%)						
	Pell Grants	**Merit Scholarship**	**Student Loans**	**Family Funded**	**Self-Funded**	**Other**
All respondents	37	7	22	33	34	17
Minority students	47	6	18	25	35	17
Non-minority students	31	7	25	40	33	16

Source: SRI Student Survey

- What are best practices, facilitators, and barriers associated with implementation of OER degrees?
- What impacts do OER degrees have on key stakeholders' experiences and on institutional culture?

Sites were selected to represent a diverse sample in terms of size, geography, and other characteristics and to involve sites that had not participated in other in-depth data collections. See Appendix A for detail on the sites visited, data collected, and analysis methods.

Cost Data Collection and Analysis

rpk GROUP is leading the financial data collection and analyses to understand the financial impact that OER degree pathways have on students and institutions. Grantee-reported information is used to estimate the savings to students from eliminating commercial textbooks in OER degree pathway courses, the corresponding revenue impact on colleges from a potential reduction in bookstore sales, and the costs of implementing OER degrees. On completion of the research, we will also examine longer term impacts from changes in student behavior and performance such as course withdrawals, retention, progression, and average credit hour load.

Data collection templates were used to collect institution-level information on

- enrollment and course offerings – OER degree pathway and college-wide;
- bookstore sales revenue, units sold, and commission rates and revenue;
- textbook prices and purchasing patterns;
- OER fees and/or printed OER textbooks and course materials; and
- cost of attendance – tuition, mandatory academic fees, student grant aid, and textbooks.

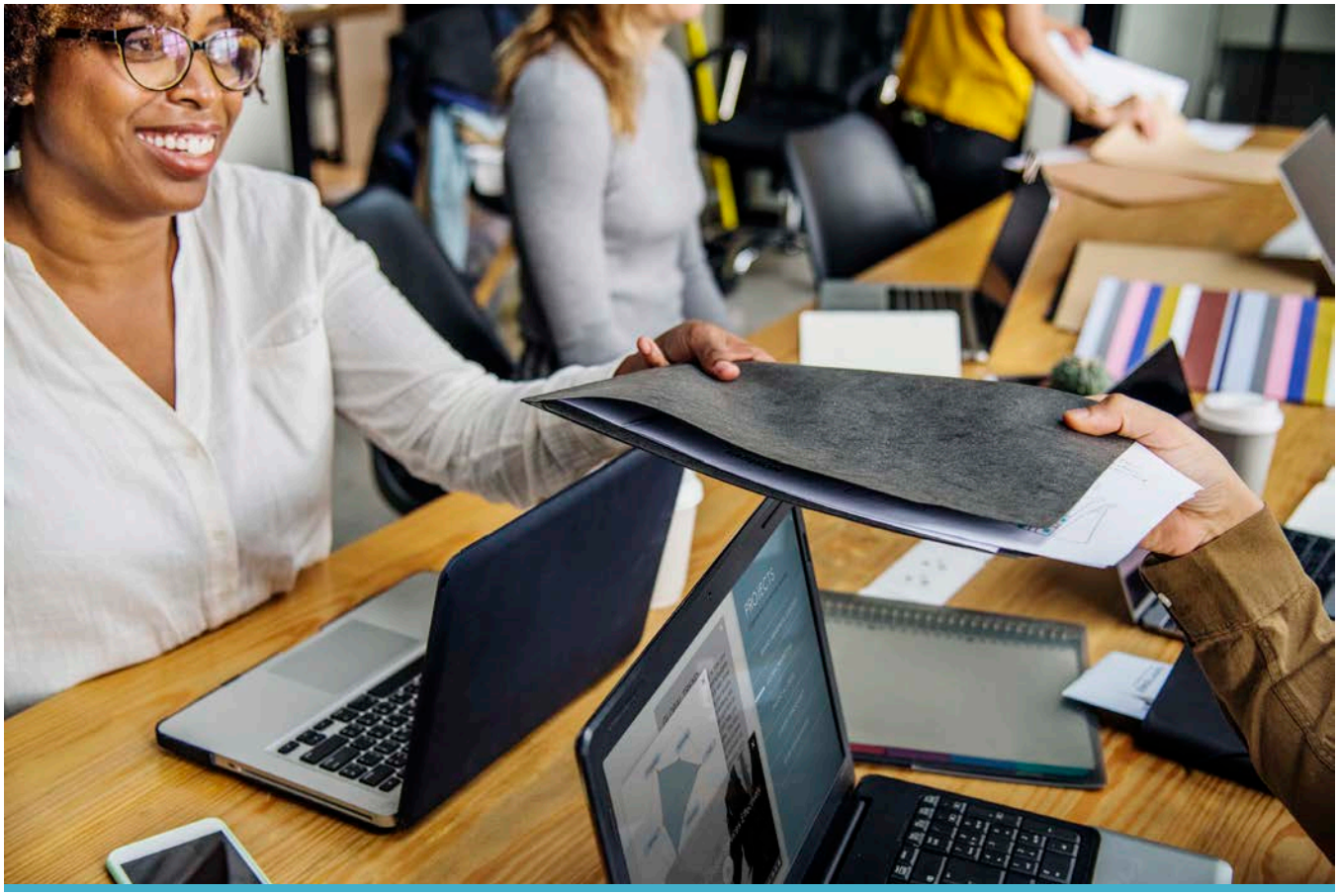
The response rate for each of the data collection cycles ranged from 70 to 100%, although some colleges did not submit complete data templates. rpk GROUP helped grantees with data collection, reporting, and making data revisions when necessary. When possible, rpk GROUP assisted colleges with data reporting by populating or estimating missing data elements using information from publicly available websites, data reported to SRI, or data elements the college previously reported.

In addition, 5 grantees are serving as "cost partners" and are providing more detailed data on the cost of developing OER degree pathways. These colleges provided additional information on the revenues and expenses (personnel and operating, including stipends/release time) associated with developing an OER degree pathway, including the time and cost of developing OER courses. These data were collected through time logs on which instructors recorded their weekly course development activity during 6-month periods and through site visit interviews.

Gathering bookstore sales information is often the most challenging part of the cost data collection. Bookstore vendors regularly provide colleges with general sales data, although more granular information is usually only available upon request to the corporate office since local bookstore managers are not permitted to provide sales data. The research team engaged with the two primary bookstore vendors in spring 2017 to explain the purpose of

the evaluation and data elements being collected and to request corporate support for the financial data collection. One vendor agreed to facilitate data collection at the corporate level upon the grantees' request; although all colleges were advised that any supplemental data requests should originate with their college's regional bookstore manager.

Analyses of students' savings and institutional impacts were conducted with data collected from 2 years of the initiative (summer 2016–spring 2018) and are included in this report.[6] At the conclusion of the grant period, the fifth and final data collection will be launched (January/February 2019) to collect information about activities that took place during the 2018 summer and fall academic terms.



6 We collected cost data for summer 2016 because some grantees began implementation at that time.

Progress of OER Degree Implementations

Reported here are the number of OER courses offered as part of the ATD initiative, the number of students enrolled, and the estimated costs and savings of OER degree pathway implementation.

OER Degree Course Offerings and Enrollments

From fall 2016 through spring 2018 (inclusive of summer and winter terms), ATD grantees reported having completed 385 OER courses and offered 2,946 OER sections enrolling 71,177 students (Table 3). Nineteen colleges reported enrollments of more than 1,000 students in OER degree sections. To count for the ATD initiative, courses needed to be certified by Lumen Learning as OER. We also included courses whose certification was submitted and pending approval at the time they were offered.

Aggregate Cost Savings

Student savings are often the primary motivation for colleges to pursue OER degrees, but actual savings are difficult to estimate because of variation in students' purchasing patterns and textbook prices. Colleges often report student textbook savings simply by multiplying the number of students enrolled in OER courses by the average cost of a new textbook. However, information from the student survey and focus groups (not to mention other research on student purchasing behaviors[7]) suggests that our estimates would be inflated if we assumed all students purchase new textbooks. Additionally, OER courses may entail incidental costs for students such as course fees or the option to purchase printed OER textbooks or course materials (even if they may be accessible online for free). Thus, these courses may be more affordable for students but are not necessarily free.

Information grantees provided on OER enrollment, textbook prices, and bookstore sales was combined to generate a range of per-student savings estimates. In courses with a Lumen Learning-certified OER section, grantees reported that the cost of new textbooks/course materials for traditional sections averaged $121 at the college bookstore (see Appendix C for detail on business-as-usual cost estimates).[8]

Because not all students purchase new textbooks, a blended price was calculated incorporating multiple types of purchases. Sales data provided by grantee colleges indicated that new print textbooks represented about two thirds of textbook sales at their college bookstores, while used and rented print textbooks each accounted for approximately 15% of sales. Digital books represented a very small portion

7 See for example Hill P. (2016). How much do college students actually pay for textbooks? E-Literate, March 25. Online at http://mfeldstein.com/how-much-do-college-students-actually-pay-for-textbooks/.

The College Board, Online at https://bigfuture.collegeboard.org/pay-for-college/college-costs/

quick-guide-college-costs. 2014 survey by Student Monitor, available at www.studentmonitor.com/f14/Fall14Deck.pdf. Donaldson R, Nelson D, Thomas E. 2012. 2012. Florida Student Textbook Survey. Tallahassee: Florida Virtual Campus. Online at http://www.openaccesstextbooks.org/%5Cpdf%5C2012_Florida_Student_Textbook_Survey.pdf. Hill, P. 2016. Students are spending less on textbooks, but that's not all good. Chronicle of Higher Education, February 25. Online at http://www.chronicle.com/article/Students-Are-Spending-Less-on/235340.

8 For OER courses without a traditional section, prices from traditional sections offered during other semesters were substituted when available.

Table 3: OER Degree Courses Offered (Fall 2016 – Spring 2018)

	Total (All Sites)	Average (By Site)	Median (By Site)	Range (By Site)
Courses	385	13	10	1-55
Sections	2,946	95	57	2-411
# Students Enrolled in Beginning of Course	71, 177	2,300	1,511	57-9,505
# Students who completed course with C minus or better	50,157	1,621	1,210	46-7,384
# Pell Eligible Students Enrolled (after drop date)	30,603	988	800	14-3,119
# Pell Eligible Students who completed course with a C minus or better	20,936	676	621	13-2,258

Source: Grantee Section-Level Data

of bookstore sales across colleges; digital codes that students purchase to access online homework or other content are typically reflected in new print book sales data. **The blended price for all bookstore sales at the college bookstore averaged $90; when limited to the OER degree pathway, the blended price averaged $80 for traditional sections of courses that also had OER sections.**

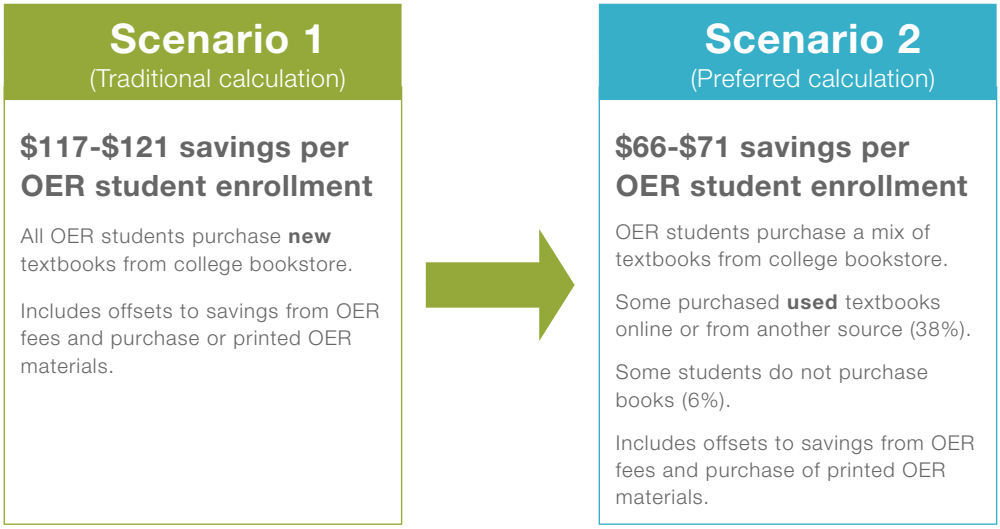
To provide a more comprehensive picture of students' savings from OER courses, we compared two scenarios with varying assumptions about student purchasing patterns and behaviors (Figure 1). Scenario 1 reflected the common assumption that all students purchase new textbooks from the college bookstore. Scenario 2 reflected the more likely student behavior of purchasing a variety of new, used, or digital textbooks or renting textbooks and acknowledged that about 6% of students typically do not purchase textbooks (according to the student survey). Scenario 2 further accounted for students' purchasing textbooks from sources other than the college bookstore; according to the student survey, 38% of students purchase textbooks online or from other sources.[9]

Savings estimates ranged from a maximum of $121 per student enrolled in a certified OER degree course under Scenario 1, to a minimum of $66 per student for Scenario 2. Accounting for varied purchasing patterns (new, used, rental, digital) and the location of those purchases reduced the savings estimates by as much as 46% relative to estimates that assumed all students purchased new textbooks (Scenario 1).

The total savings to students from the ATD initiative were derived by multiplying the savings per student by cumulative enrollments in OER degree courses (Figure 2). Aggregate savings for students who were relieved of the obligation to purchase commercial textbooks in OER courses ranged from $7.2 million to $12.3 million over 2 years. The maximum textbook savings estimate of $12.3 million was based on the

9 Used textbook prices were used to estimate purchases from non-campus stores which provides a conservative estimate of student savings.

Figure 1. OER Cost Saving Scenarios



Source: Institutional Cost Data, SRI Student Survey; rpk GROUP Analysis

methodology adopted by many colleges (Scenario 1) and on the assumption that all students enrolled in OER courses would have purchased a new textbook, but it is most likely an overestimation. Savings at the lower end of the range ($7.2 million) represent the assumptions from Scenario 2, which more accurately reflect student purchasing patterns.

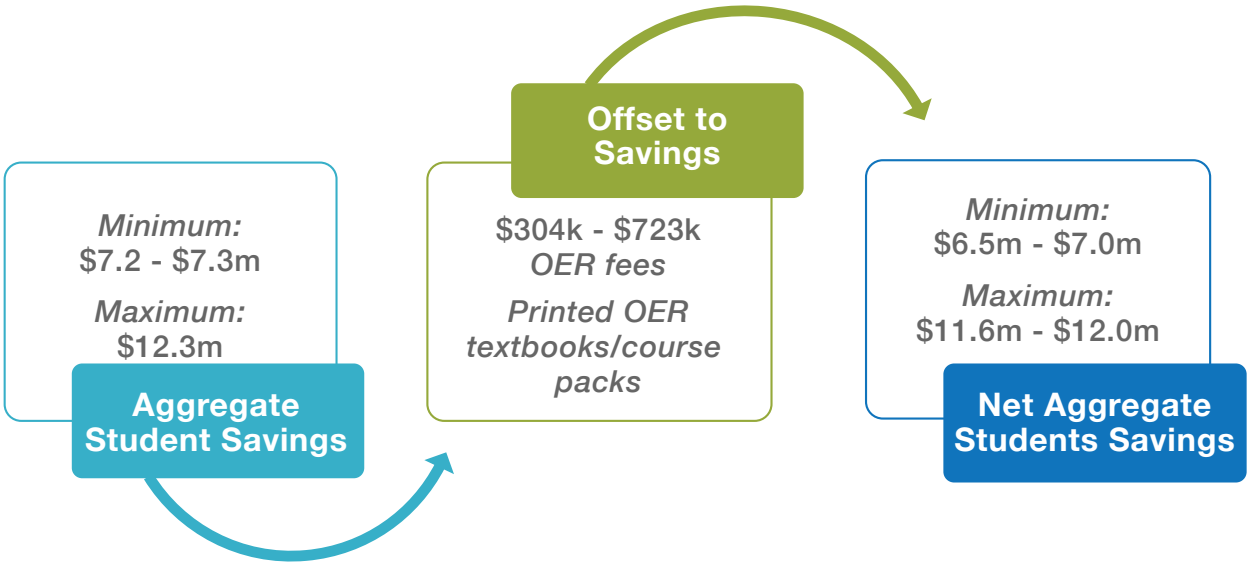
In addition, we incorporated offsets to savings due to costs to students associated with OER courses. These additional costs included OER course fees and printed OER course materials reported by grantee colleges and combined with corresponding data collected through the student survey.

- Five grantee colleges indicated they charged OER course fees for some or all of their courses, with the fee averaging $14 per course.
- About 14% of students reported on the survey that they paid an OER course fee.
- Twelve colleges that offered OER courses during 2016/17 or 2017/18 indicated they offered printed OER course packs or textbooks, which cost $32 on average.
- About 13% of students reported on the survey that they purchased printed OER course materials.

Because these offsets affected relatively few courses and students, their impact was limited, reducing student savings by 2% to 10%, ranging from $304,000 to $723,000 over 2 years (see the section on student savings and Appendix C, Figure C1, for detail).

The overall net savings to students enrolled in OER courses during the 2 years of the grant was estimated to total at least $6.5 million (see Figure 2). These net savings are expected to increase as certified OER courses and enrollments continue to grow.

Figure 2. Aggregate Student Savings in OER Degree Pathway, Two Years (2016-17 and 2017-18)



Source: Institutional Cost Data, SRI Student Survey; rpk GROUP Analysis

How OER Degree Programs Impact Students

This section describes student perspectives on the impact of OER degree pathways, awareness of and experience in OER courses, and access to technology and course materials.

Impact on College Affordability

The assessment of how OER degree pathways impact college affordability was based on data from the student survey, site visits, cost templates, and cost partners. We integrated these data sources and analyses to provide a nuanced description of how students typically acquire course materials and how much they spend, how much students save when taking OER courses, and how OER degrees might impact overall college affordability.

The cost of textbooks is a significant burden for students, especially low income students. Textbooks represent a significant portion of students' costs to attend community college. We estimate that books and course materials at grantee colleges averaged $1,119 annually for full-time students in 2017/18,[10] with books/materials accounting for 20% of the $5,706 average cost of attendance (tuition, mandatory academic fees, and books/materials).

More than 60% of students indicated on the survey that on average they spent over $100 per course on textbooks. During the focus groups, students

> *"I'm a single mom… textbooks are expensive and I don't have financial aid, so it's a big deal and that's why I purposely did the OER courses, 'cuz there's no way I'm going to be able to afford an $80 or $100 book"*
>
> – Student

indicated that they spent as much as $600 per semester on textbooks and other required course materials, roughly in line with the estimate above.

As noted, determining per-course costs for a typical course is complicated by student purchasing patterns. In focus group discussions many students said they comparison shopped online, and one third of survey respondents indicated that they purchased most textbooks online. Many students reported that they relied on websites not affiliated with their colleges for textbook purchases, as college bookstore prices are, in the words of one student, "outrageous."[11]

The survey results indicated that low-income and underrepresented minority students were less likely to take advantage of cost saving options for purchasing textbooks. This finding mirrors that of another analysis from 2016 showing that first-generation students on average pay 17% more for textbooks.[12] Financial

10 Colleges are required to report the annual cost of books and supplies for full-time students on federal IPEDS (Integrated Postsecondary Education Data System) surveys. In 2017/18 books and supplies averaged $1,365 at grantees colleges. rpk GROUP adjusted these estimates to remove the cost of supplies, estimated at 18% using ATD grantee-reported bookstore sales data.

11 Price estimates for online used textbooks were outside the scope of our grantee data collection, but according to recent research, typical purchases averaged $51 to $56 (see Appendix Figure C1)

12 Hill P. (2016, February 25). Students are spending less on textbooks, but that's not all good. Chronicle of Higher Education. Online at http://chronicle.com/article/students-are-spending-less- on/235340

aid recipients are often eligible to receive bookstore vouchers, but they usually are redeemable only at the college bookstore, limiting students' ability to comparison shop for lower prices.

Students reported that affordability of courses and course materials played an important role in their college progression, with 16% indicating that they had stopped taking courses for a semester or more because they could no longer afford them, and 12% indicating that they had withdrawn from a course because they could not afford required materials. The latter percentage was higher for underrepresented minorities, with 17% indicating that they withdrew from a course because they could not afford the required materials, compared with 9% of students who were not underrepresented minorities. While these percentages are not high, keep in mind that one third of respondents were in their first semester of college. Moreover, 53% of students reported that they had not bought or rented required course textbooks or materials at least once. Of these, 45% indicated it was because they could not afford them.

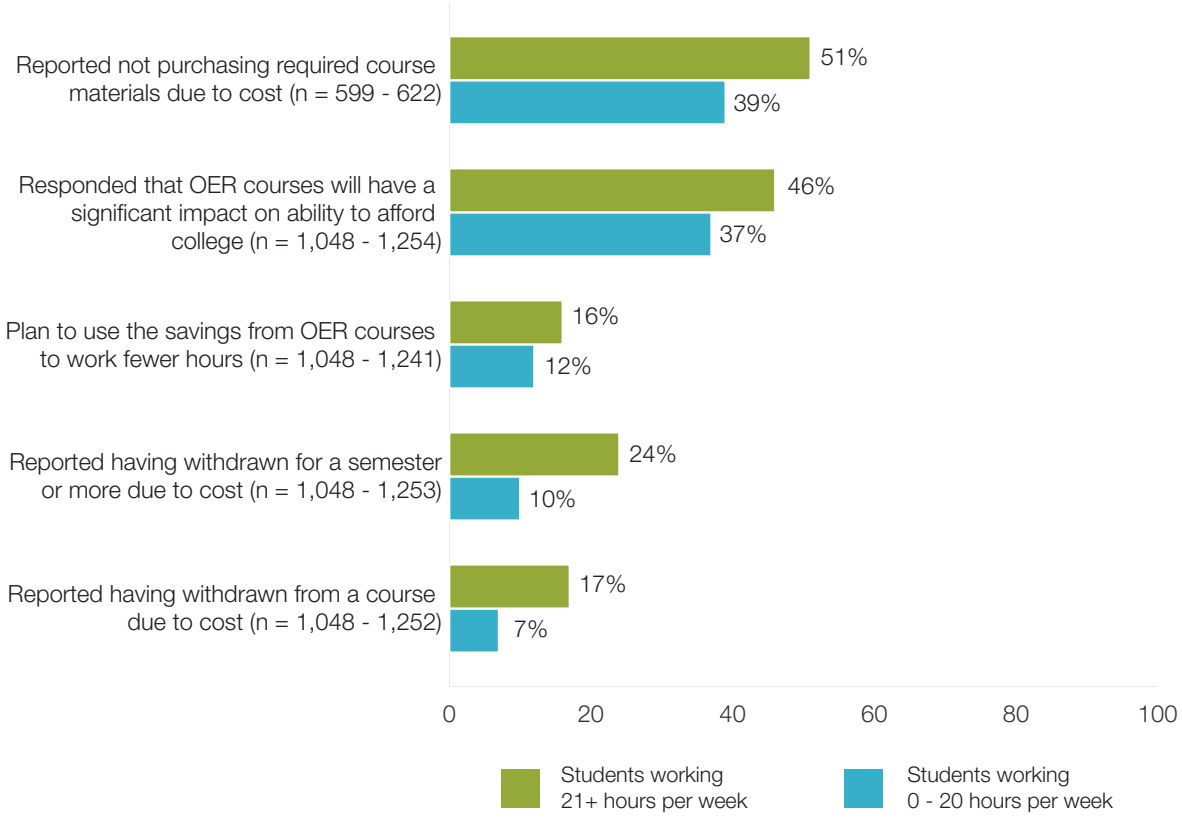
Students who work more hours (more than 20 hours per week versus less than 20 hours per week) were significantly more likely to report not purchasing required materials due to costs. They were also more likely to say they had withdrawn from a course due to cost and to have stopped taking courses for a semester or more because they could not afford them. These discrepancies could be in part due to having taken more semesters of college. Students who work more were more likely to respond that OER courses would have a significant impact on their ability to afford college, but were only slightly more likely to use savings from OER courses to work fewer hours. (See Figure 3).

> *"I have financial aid and get refunds when I don't spend all of it. Money saved on not having to buy textbooks I can put towards other courses. Having extra come back to you to put towards other courses is really nice. Summer courses are out of pocket; what you get back from financial aid can go towards summer courses."*
>
> – Student

> *"My financial aid stopped, but luckily some of my classes were actually OER at that time....I usually spend per semester like $500–800 for my textbooks, so at that time I was like, OK, I don't have to spend as much. So it was really beneficial."*
>
> – Student

A substantial number of students said OER will affect their ability to afford college. Many college students, especially those whose college education is self-funded, worry about how to afford all the materials and supplies necessary to succeed in their courses. The potential cost savings from OER courses can mitigate some of these expenses. In fact, 41% of students reported that OER courses will have a significant impact on their ability to afford college. This percentage increased to 48% for Pell Grant recipients and 52% for underrepresented minorities.

Figure 3. Survey Responses by Hours Worked Per Week

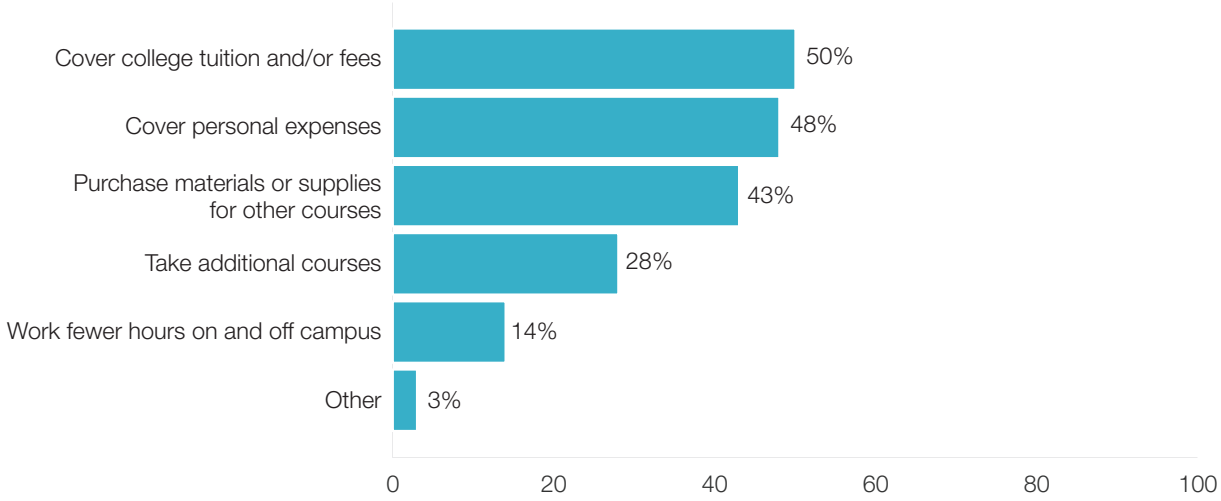


Source: SRI Student Survey

Students planned to use cost savings from OER courses toward other education expenses. Half the students surveyed reported that they would use their savings to cover college tuition and/or fees (Figure 4). Other common uses were covering personal expenses (48%), purchasing materials or supplies for other courses (43%), and taking additional courses (28%). Students explained that they "felt better" about taking classes now that they could spend less money on them and more on other necessities like food, gas, and rent.

> *"Not having to pay for textbooks makes it so much easier and cost efficient to come here."*
>
> – Student
>
> *"[OER] allowed me to go forward and finish up, without worrying about books."*
>
> – Student

Figure 4. Students' Planned Use of Savings from OER Classes



Source: SRI Student Survey

Most students were unaware that they were signing up for an OER course at the time of registration. Students learned about OER courses through multiple methods and channels. The survey results revealed that most students learned that the courses they enrolled in were OER through an advisor or instructor (34%) and/or through the course syllabus (30%). A surprisingly high proportion of students–almost 60%–indicated that they did not know the class they were signing up for was OER at registration. In fact, 19% of students indicated that they learned their course was OER by taking the student survey. Students who work more than 20 hours per week were less likely to be aware of other OER courses on their campuses (37% versus 46% of students who work less than 20 hours).

Designating courses as OER in the college schedule of classes and/or course catalog is a promising approach for increasing student awareness and uptake of OER. For example, during a focus group at a school that is using the OER designation in the course catalog, one student said, "When I was registering for classes, I purposely clicked on courses that had the OER symbol because I knew that would save me money." Conversely, at a school that was not using the OER designation, a student said, "If they were shown as OER courses, that is all I would take."

> *"I was happy. I found out [the course was OER] after in January, when we started, when I got the syllabus."*
>
> – Student

> *"I had no idea it was a 'z' course, just signed up because it fit in my schedule. The course catalog was confusing – didn't make it clear that you didn't need a textbook.""*
>
> – Student

Four colleges have reported that they have already added an OER designation to courses in the catalogue so students can easily determine whether the course is OER at the time of registration, and another three have zero cost tags. A number of others reported that they had started this process. This is supported by the fact that 24% of students reported that they learned their course was OER because it was indicated in the course name or next to it when they registered.

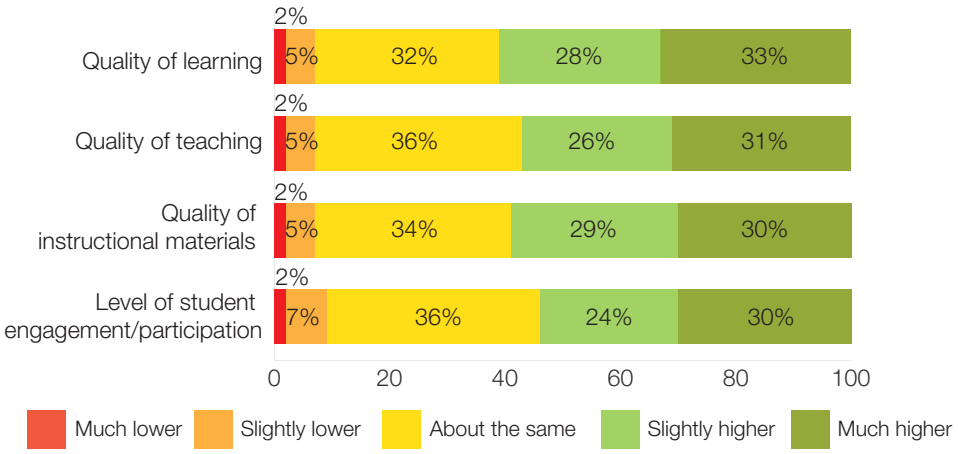
Students enrolled in OER courses for several reasons, but strong influences on their decision, as reported in the survey, were requirement for their major (71%) and advisor or faculty encouragement (23%). Only 12% reported that a friend's or classmate's recommendation had a strong influence on their decision. Given students' lack of awareness that their courses were OER when they registered, it is not surprising that only 23% reported that cost savings strongly influenced their decision to enroll. The low proportion of students reporting that advisors or faculty or friends or classmates strongly influenced their decision speaks to the ineffectiveness of word of mouth for heightening awareness of and enrollment in OER. The low effectiveness of word of mouth is further demonstrated by the fact that the vast majority of students participating in the focus groups had not heard the term *OER degree* before and were unaware of the OER degree pathways available at their colleges.

Students had very positive views about their experiences in OER courses. During focus groups, students described specific benefits of OER courses and materials. For example, many students appreciated having access to the course materials on the first day of class rather than having to wait for the textbook to be delivered or restocked at the bookstore. Having immediate access to course materials allowed students to keep up with assignments and follow along in class. Furthermore, many students appreciated having online access to the materials, with one student stating, "Mine were great….I didn't have to carry my textbook around; I could just use my cellphone if I wanted to look up notes or study."

Student comments from focus groups:

> *"The textbook was nerve-racking. So much content with little time. With the OER, it feels doable….It was organized so that the homework was together with the lesson."*
>
> *"Everything is broken out and better organized."*
>
> *"It's less boring. With the textbook*
>
> – Student close to graduation
>
> *"…You can take notes quicker and learn more that way. [You] can personalize it more with OER with note taking and things like that. You can absorb more."*
>
> *"It was nice to be able to, while studying, go to the specific section. It wasn't like you had to go through pages and pages and hope you find the right paragraph… there was still a lot to read per section, but it condensed a lot—like, 'Here's the important stuff'….and then in lecture, we're able to expand on it."*
>
> *"[With the OER materials] it's easy to find the topics and everything he's talking about in class."*

Figure 5. Student OER Course Experience in OER Classes, As Compared to Typical Classes



Source: SRI Student Survey

More than 60% of students reported that the overall quality of their learning experience in an OER course was higher than in a typical non-OER course (Figure 5). Further, over half the students reported higher engagement, higher quality of instructional materials, and better teaching than in a typical course. In focus group discussions students indicated that their OER course materials were "easier to follow" and that the content was "more relatable." They appreciated having instructors curate materials that were closely aligned with the course objectives and easier to digest than textbooks.

More than 70% of students reported that they did not encounter challenges using OER course materials. However, 13% of students indicated that they encountered difficulty learning from the course materials, and 10% reported that the course materials were not engaging. One student explained that the graphics used in her OER course book were less clear or readable than those in traditional textbooks.

Most students consumed OER course materials electronically. According to the survey, 63% of students printed out less than 25% of materials, a quarter of students printed out 26% to 75% of materials, and 11% printed out 76% or more of materials. Some OER courses also give students the option to purchase for a small fee printed copies of course materials such as course packets. Only 13% of students chose to purchase printed copies.

Some students were constrained in accessing technology or the internet, but few cited this as a significant challenge for OER courses. Sixty-two percent of students reported that technology and/or access to technology had some or a large impact on their ability to complete assigned coursework. Students described having to complete assignments in the parking lot of their college in order to access the internet after library hours. One student went to a nearby casino to get free internet access. Yet fewer

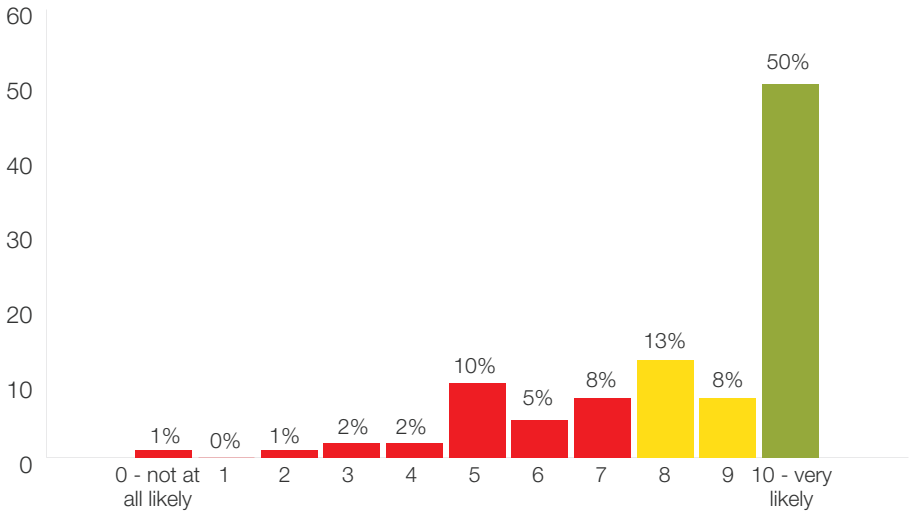
than 10% of students reported that problems related to accessing online materials, such as lack of access to the internet or to devices, were challenges for OER. Additionally, the majority of students (70%) reported that they never had trouble logging in to or accessing the OER materials online. It may be that students see technology access as a general challenge but do not associate it specifically with OER. In fact, most students see online access to OER as one of the most important benefits of these courses.

Looking to the future, 58% of students indicated that they are likely or very likely to enroll in an OER course again and to recommend an OER course to a friend. The net promoter score, which measures whether responders are willing to recommend a product or service (in this case OER courses) to others, was 39. This score was more positive among students than among instructors who participated in the 2016 survey (Figure 6).[13]

> *"I think [OER courses] are good. I like them. I wish more people used them. They are easier to navigate and easier on the back; as a wheelchair user, it's hard to lug books around."*
>
> – Student

> *"If I could go back and do OER from the first semester, I definitely would."*
>
> – Student

Figure 6. Student Responses for Promoter Scores



Source: SRI Student Survey

13 Respondents with scores of 0–6 are detractors; they are not enthusiastic about OER courses and may undermine growth through negative word of mouth. Respondents with scores of 7–8 are passives, satisfied but not excited about OER courses. Respondents with scores of 9–10 are promoters, positive about OER courses and likely to recommend them to others. The net promoter score is the sum of promoters minus the sum of detractors.

Launching an OER Degree Program

This section discusses how OER degree programs originated and barriers and facilitators to implementation. Many of these topics build on findings from the 2017 report. Also described are the costs of launching OER degree pathways and the impact on bookstore revenue.

Rollout of OER Degree Programs

From the data collected during the site visits, we identified patterns in colleges' OER degree program rollouts and highlight illustrative examples. Since we visited 11 out of 38 colleges, we cannot assume that these findings are representative of the larger set. Appendix A provides details on how data collected during interviews were coded and analyzed.

Most OER degree initiatives originated from grassroots faculty activity. In the 2017 formative implementation report, we identified a set of paths through which OER degree programs originated: grassroots faculty OER adoption, administrator led, and service unit led. Among the colleges visited, the OER initiative was most often a grassroots effort driven by instructors who had already been using OER materials. In some cases faculty joined forces with other staff members or administrators to expand the initiative. In others, administrators used the ATD grant to expand on instructor-led OER courses.

When OER degree initiatives have been led by administrators or service units, the individuals held a variety of roles. At one site the director of library services drove the adoption of OER materials and

> *"Before the grant happened we already had people interested in OER. I worked on two classes that wanted to use OER.…It allowed us to have some experience with OERs for the grant. CCCOER [Community College Consortium of Open Education Resources] told me about the grant. The president came to me when the grant came out and we got a team together."*
>
> – Instructor

become the initiative lead. At another, the distance education coordinator learned about the program and gained support from the administration. At a third OER was introduced by a center for instructional innovation.

Most colleges prioritized scale of impact on students in selecting an OER degree pathway. Colleges considered a variety of factors when choosing which program to target for the degree pathway. The most commonly mentioned factor was the desire to benefit as many students as possible. The two second most common factors were feasibility (e.g., availability of OER content) and the degree to which faculty in the department were interested in, or at least exhibited the least resistance to, OER courses and development.

Students advocated for textbook affordability, and in a several colleges they were actively involved in OER initiatives. Students played an active role in three of the colleges. In one, interviewees said the student government formed

a resolution and advocated for OER in the face of some faculty resistance. In another, the student government collaborated with an OER advocate before the grant to conduct a student survey testing affordability of Lumen Learning's $10 hosting fee. At the third college the student government appointed a liaison to the state legislature and was instrumental in a statewide survey of students to define affordability for OER programs. Four other colleges reported that students have been vocal about textbook affordability, that there has been some outreach to student government, or that students have been peripherally involved but not systematically.

Recruiting instructors for all required courses in the pathways continues to be a challenge. The greatest challenges faculty and administrators cited in developing the courses required for the OER degrees were availability of materials, time demands, and faculty resistance. Instructors said they sometimes struggled to find materials for advanced courses or for specific subjects, such as English, and some noted a perception that materials are not always of high quality or that it is difficult to determine the quality. Certain types of OER materials are also more rare, such as good illustrations and charts (particularly in highly technical subjects) or primary sources in literature and the arts.

The second challenge was time demands. Instructors said creating new materials, aligning existing materials with their goals and standards, and certifying materials were particularly time consuming. As discussed under "Costs of Developing OER Degree Pathways," below, stipends typically covered only a fraction of the time needed for this work, meaning instructors needed to redirect time from other activities or use personal time. Furthermore, the certification process is a required time investment particular to this initiative.

> *"We already had a jump-start on the gen ed AA degree pathway. We knew we needed a certain number of credits for a degree. We looked at people teaching those courses and reached out to those people. A crucial part of the pathway plan was sitting down with people familiar with the student advising piece and discussing what courses made sense and had faculty members that would be open to OER."*
>
> – Administrator

The third challenge was faculty preconceptions about OER and resistance to change. Some instructors stated that many of their colleagues are not aware of the financial burden of textbooks on students and are resistant to changing materials and practices they think are already working fine. A number of instructors expressed frustration with colleagues who they thought were stuck in their old ways and had become too accustomed to the "easy" use of premade worksheets, assessments, and instructions that come with publishers' packages.

Both OER adopters and skeptics had concerns about academic freedom. Faculty members were concerned about having others change materials they developed beyond recognition or that companies and organizations might profit from materials they developed for free. The faculty union was cited as a factor at one college, where there was a drawn out negotiation over the size of the stipend, workload, and faculty support.

Most colleges created at least some of their own course materials, often through collaborative processes in departments. Instructors reported a range of approaches to

developing courses, including creating their own materials, editing existing materials, and simply adopting existing materials. At least six of the colleges had instructors that created their own materials, including three that developed entire textbooks. When searching for materials to adopt and/or adapt, instructors cited their social networks, internet searches, the college library, government websites, OpenStax, OER repositories, and Lumen Learning as sources.

The extent of collaborative course development was influenced by culture and practices, and most collaboration occurred within departments. At one college OER courses were co-developed by teams in each department, and materials were accessible on a Blackboard institutional site. There was also a cross-functional OER committee overseeing course development and implementation. A handful of other colleges reported sharing materials across departments. Sharing across institutions was less common, although administrators at one said there is discussion about establishing a common OER site for all the New York institutions.

Sharing of entire courses poses operational as well as cultural challenges. Many instructors were not aware of a repository or system in place for sharing courses with colleagues at their institutions. They were also not sure how to make their courses publicly accessible. Lumen Learning was cited as a mechanism for disseminating courses, but some instructors expressed concerns about how their courses would be used and their ability to retrieve materials once they were deposited with Lumen Learning. Culturally, instructors appear to perceive more risks than benefits to sharing their courses, perhaps due to confusion about whether they would be credited for their work once it is openly licensed.

Instructors said that the OER materials are more diverse, dynamic, and interactive and more contemporary and relevant than traditional textbooks. OER materials enabled them to align materials better with their learning goals. Most instructors who cited this as a benefit were already using student-centered and hands-on approaches, so using OER materials supported their existing practices rather than introducing new methods.

> *"I'm able to tailor the materials to the topic. I want them to know this thing, so I find that in the text, and I give them that reading to go along with that discussion, to go along with that quiz. And it's not, read chapter 3 and 4… and you know you're only covering half of chapter 3.… Then I break it down into smaller units… because more than half an hour at the computer they're going to lose interest and go away.… "*
>
> – Instructor

> *"Students love [learning] with OER; reference materials, magazines, online things, Democracy Now! with Amy Goodman, etc. There is big variety. When I put it on Canvas, it doesn't look like a jumbled mess. [Students] would come out of their way to tell me how much they loved not having a textbook but these things instead. It makes the course go way better, because we focus on things that are real."*
>
> – Instructor

Some instructors thought students were more engaged in the OER lessons and more inclined to read the assignments. Several faculty members reported that students were more engaged with OER materials than textbooks because they are better tailored to good pedagogy and are more relevant and interesting, and students can be more involved in the construction of the learning experience. Students can also challenge the instructor and the materials, leading to productive critical discussions. Instructors were usually not able to say whether student outcomes improved, but their engagement and responsiveness to the materials were seen as important components in learning.

Most colleges did not have course review processes specific to OER. OER courses were typically subject to the same quality review process as non-OER courses, often formal or informal peer review. Other types of review included a student satisfaction survey, a curriculum committee process, and feedback from Lumen Learning. Only one college appeared to have a quality review process specific to OER.

OER-specific supports were focused primarily on certification, copyright clearance, and compliance with grant requirements. In the 2017 report we presented evidence that use of college services related to OER can reduce the burden of OER development and improve the instructor experience. Most colleges provided some training related to OER, and a smaller number provided library support for content discovery and OER certification and/or instructional design support for course development. OER-specific supports were focused primarily on certification, copyright clearance, and compliance with grant requirements. Support for course design and technology implementation tended to be more general rather than specific to OER.

Librarians may be underutilized resources. Librarians can assist with copyright and licensing issues, as well as finding and vetting OER materials. One library director described an "organic" approach to faculty engagement that emphasized responsiveness to requests, which had been minimal. Similarly, a librarian at another college said several librarians were available to support faculty but their help was rarely requested. In a couple of cases librarians had more formal roles in OER projects. At one, a college librarian was specifically designated to support OER work; at another, the interim library director was the point person for the ATD grant and OER on campus generally. The director managed the Lumen Learning certification process and oversaw four librarians (out of 14) who worked on OER, helped instructors find materials based on their learning goals, assisted with licensing issues, and conducted preliminary checks of courses before sending them to Lumen.

Practices for communicating to students about OER degrees were still emerging and generally were not targeted to particular students. Two colleges reported multipronged strategies for student outreach. At one, marketing has primarily involved various media efforts and aimed to reach all students. The college created banners, held a "free the textbook" rally, issued press releases in newspapers, published an article in a higher education journal, and distributed T-shirts promoting OER. The other college listed OER courses in the bookstore, distributed OER literature to students, and sought television and newspaper coverage. Several colleges cited the importance of advisors in making students aware of OER options, and in one case advisors were the sole source of information. In another case, advisors had not received any specific training about the OER degree initiative. Other colleges reported minimal marketing, were still

Examples of instructor supports

College 1: Resources available to instructors include IT staff, an instructional design team, librarians, and graphic designers. The director of online learning also plays a prominent role, providing regular trainings, workshops, support with content discovery and copyright clearance, and working one on one with faculty to develop courses, along with the instructional designer and a web designer.

College 2: Instructional designers help with distance learning courses but not OER specifically. The college provides release time. The Office of E-Learning, Innovation, and Teaching Excellence provides support in instructional design, curating and sourcing materials, and generally on copyright clearance issues. The library also supports with copyright and vetting materials.

College 3: The OER manager provides the main elements of support, including expertise, advocacy, and help with Lumen Learning certification. Instructors mostly work within their departments and support each other.

College 4: Faculty members received extensive training to meet grant requirements, although this was not paid for by the grant. The IT department has a Blackboard expert and instructional designers for faculty and supports online courses. Lumen provided training for OER content discovery and copyright clearance.

planning their marketing strategies, found marketing to be challenging, or had chosen not to market because the courses were already full. One college limited its marketing of OER courses because they did not want to stimulate demand that could not yet be met.

The colleges were taking steps to tag OER options in their course catalogues. Seven of the colleges reported that OER courses were tagged in the catalog, in some cases as low cost or zero cost. At one college, courses were labeled OER and students could click on a link for an explanation. Another college's online catalog indicated whether courses were OER or ZTC (California's Zero Textbook Cost program), and users could hover over each logo for an explanation. Students could also search specifically for OER courses.

Colleges reported a number of strategic goals aligned with the OER initiative: reduced cost of college attendance, increased access and equity, decreased time to graduation, and improved teaching and learning. Some goals were interrelated; reducing cost was seen as the driver of access and equity, which in turn was expected to lessen time to graduation. The strategic rationale for OER degrees tended to be expressed at a high level. For example, participants noted that OER fits with equity goals, but this connection was not operationalized in the form of targeting communications to at-risk students.

Examples of strategic rationale for OER degrees

College A recently implemented a 5-year strategic plan to increase graduation rates, and administrators viewed the OER degree program as furthering this goal by increasing affordability; they also cited the added benefit of OER leading to multiple ways to engage students and support accessibility.

College B saw the OER degree as well aligned with the implementation of a statewide "guided pathways" program that encourages students to choose their major from the start and provides a pathway to complete the degree in 2 years.

At College C, the OER initiative contributed to the institutional goal to decrease time and cost to degrees, as well as the Open Initiative, which strives to provide "z degrees" (z = zero-cost, free degree pathway).

College D saw OER as a way to extend benefits of a comprehensive wraparound support program known as ASAP (Accelerated Study in Associate Programs) to additional students who did not qualify for that program, e.g. because they do not meet the proficiency requirements.

College E administrators saw OER as advancing the college's focus on access and improved pedagogy, which are at least as important to them as cost savings.

Cost of Developing OER Degree Pathways

The detailed information provided by the five cost partners on revenues and expenses associated with developing their OER degree pathways provides an initial look at the resources required. The five cost partner colleges were asked to report *all* sources of funding that supported the development of their OER degree pathways and all associated costs, including faculty and staff time, even if not directly supported by ATD grant funds (Figure 7).

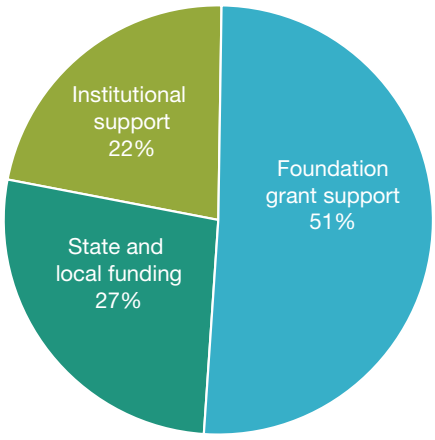
Program expenditures averaged $494,000 across the five cost partners for the 2 grant years. During these 2 years (2016–17 and 2017–18) cost partners received an average of $263,000 in funding to support their OER programs, accounting for 53% of costs. The colleges provided additional direct funding through existing college cost centers (e.g., in the form of faculty and staff time) that accounted for nearly half of the resources expended.[14]

Two-thirds of all expenditures directly supported the development of OER courses (see Figure 6). About half the expenditures covered the value of instructors' course development time and the stipends/release time they received. The remaining 14% of course development expenses reflected the value of time that academic support staff (librarians, instructional designers, etc.) devoted to the development of OER courses.

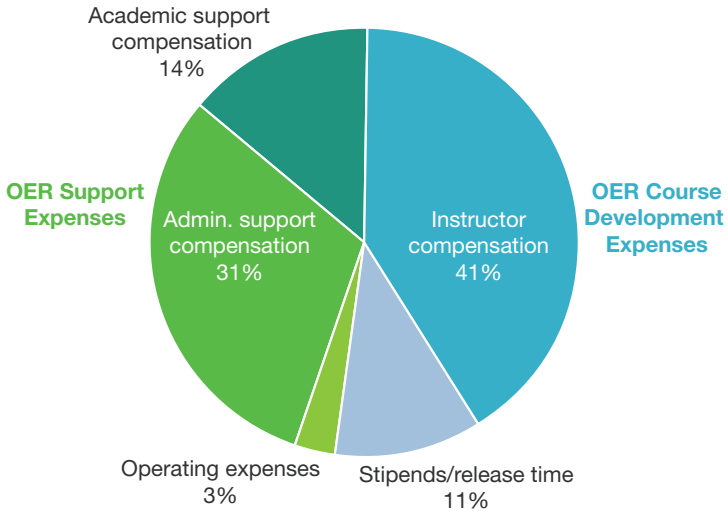
About one-third of cost partner expenditures provided general support for the project (see Figure 6). The majority of these expenditures covered administrative oversight and support (31%) for the program. The cost partner colleges had very few direct operating expenses because they were already using the technology to develop and deliver OER

Figure 7. OER Funding Sources and Expenditures

OER Degree Pathway Funding Sources
5 Cost Partners: Two Years (2016-17 and 2017-18)



OER Degree Pathway Expenditures
5 Cost Partners; Two Years (2016-17 and 2017-18)



Source: Cost partner data, rpk GROUP analysis

14 The cost partner colleges also generated an average of $1.4 million in tuition revenue from enrollment in Lumen Learning-certified OER courses. This revenue is not included as an OER funding source; it supports general instructional costs regardless of whether the courses are taught with OER or traditional instructional materials.

courses. Preexisting capacities and data availability were criteria for the grant and for selecting cost partners, so it is possible that the costs reported here might be different from those of more typical colleges.

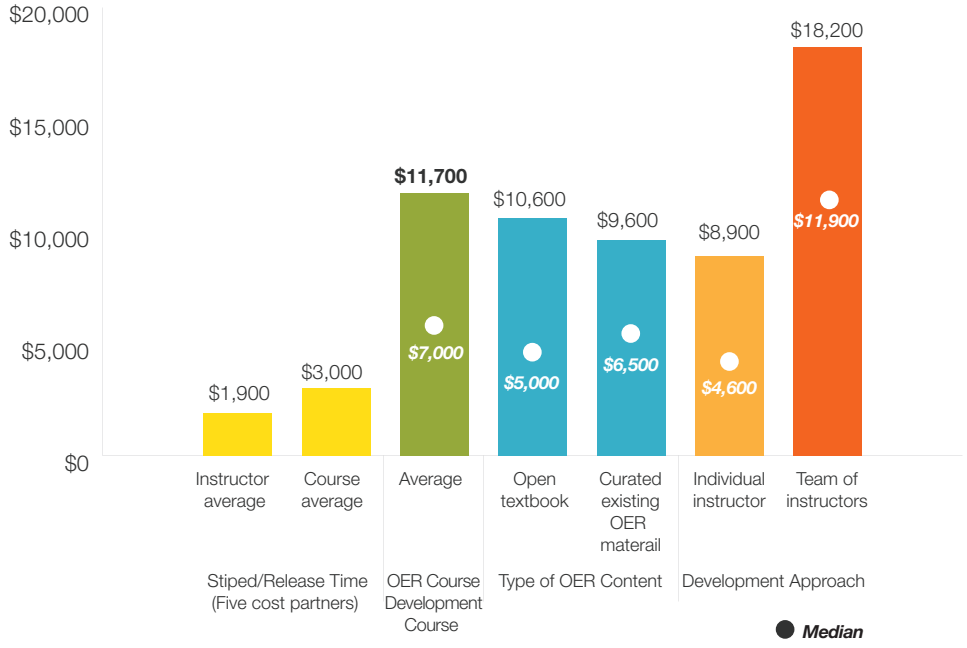
Course Development Costs

The time and cost of developing OER courses were drawn from weekly time logs of course development activities that instructors maintained while they were developing their OER courses. The cost partner colleges aggregated the weekly time logs and submitted them to rpk GROUP every 6 months; the value of instructors' time was estimated by then applying each college's hourly salary and benefit cost (by academic rank) to the hours reported.

The cost of developing an OER course averaged $11,700 (salary and benefits) at the five cost partner colleges during the first 2 years of the grant (Figure 8). The costs of instructors' time exceeded the value of stipends/release time the cost partner colleges provided, which was valued at $3,000 per course, on average, indicating that these payments are not a good proxy for the full cost of developing OER courses. Stipends/release time for individual instructors averaged $1,900 which accounts for courses developed by teams of instructors.

The type of OER materials used did not substantially impact average course development costs. Courses using open textbooks (e.g., OpenStax) can be just as expensive to develop as courses using materials selected and integrated from various sources. Interviews revealed that some instructors used open textbooks as a starting point and proceeded to make extensive revisions, often devoting significant time to finding better images, illustrations, and videos to incorporate, which increased average development costs. Instructors also noted that open textbooks typically do not include homework questions, test banks and answer keys, or activities, all of which take considerable time–and expense–to develop.

Figure 8. Compensation Costs of Developing OER Courses: Compensation Expense Five Cost Partner Colleges, Two Years (2016-17 and 2017-18)



Source: Cost Partner Data; rpk GROUP Analysis

Courses developed in teams were about twice as expensive to create than those developed independently ($18,200 vs. $8,900) (see Figure 7). Teams can provide advantages in terms of confidence in course quality, a less isolating experience, and faster time to course completion. But teams may also require additional coordination, sifting through an abundance of team materials, and time to review/comment and come to consensus. An open question is whether these higher costs yield a positive return over time due to increased adoption and sustainability of these courses.

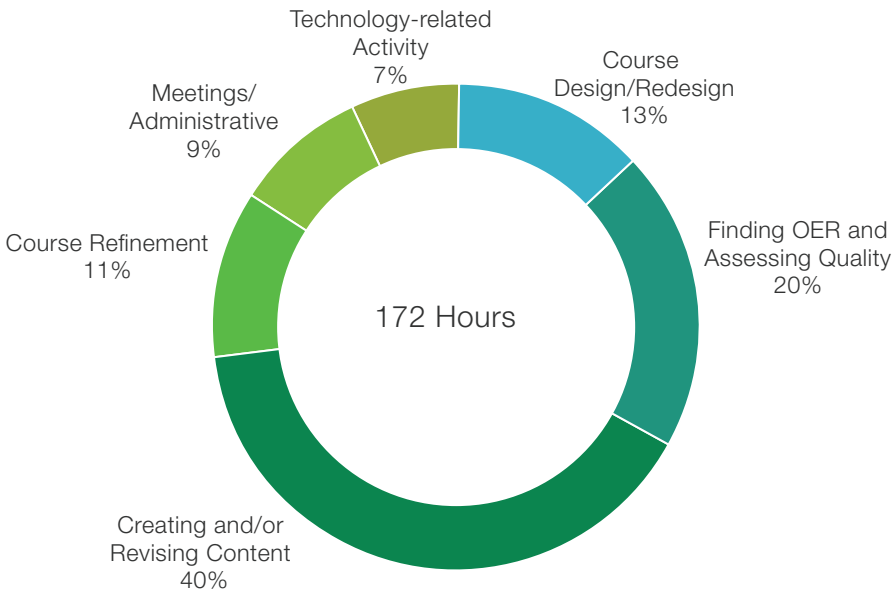
OER courses took about 172 hours on average to develop (Figure 9). Instructors spent about 60% of course development time finding OER and assessing its quality (20%) and creating or revising content (40%). Teams spent more time creating and revising content than individual course developers (46% vs. 35%) and spent less time on course design/redesign, but otherwise their activities were similar.

Bookstore Revenue Impact

Information grantees provided on bookstore sales was used to estimate the impact of reduced textbook sales on the colleges' revenue stream. Vendors operated bookstores at 28 of the grantees under contract with the colleges; five colleges had self-operated auxiliary bookstores. Under contractual bookstore agreements, the colleges received a sales-based commission negotiated as a percentage of store sales and typically included a minimum commission guarantee; self-operated bookstores typically returned some or all of their profit to the college.

In 2017–18, the bookstore commission/profit averaged about $640,000 across the grantee colleges (Figure 10). The financial impact of OER courses on college bookstores was less than the overall impact on student savings because many students do not purchase books through the campus bookstore.

Figure 9. Costs of Developing OER Courses, Overall

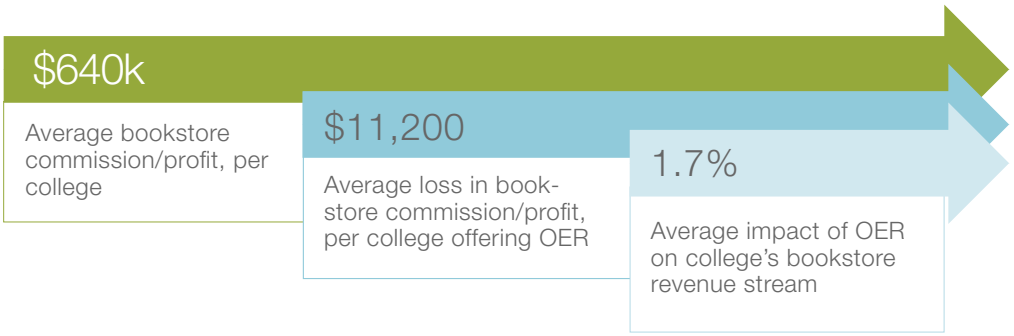


Source: Cost Partner Data; rpk GROUP Analysis

Furthermore, some colleges' commission revenue was unaffected because their sales were already below the minimum annual guarantee. **Grantees offering OER courses during the first 2 years of the grant were estimated to have collectively lost about $420,000 in bookstore commission/profits (about $14,000 on average per institution).** In the second year of the grant, when most colleges were offering OER courses, the loss in bookstore commission revenue averaged about $11,200 per institution.

The impact of OER courses on colleges' bookstore revenue stream was minimal, averaging less than 2% of the typical commission/profit. As OER enrollments continue to increase, the impact on bookstore revenue streams is expected to grow. However, the **overall impact on institution budgets is expected to remain very small because bookstore revenue streams typically contribute less than 1% of total institution revenues.**

Figure 10. Aggregate Impact of OER on Grantees' Bookstore Revenue, Year 2 (2017–18)



Source: Cost Partner Data; rpk GROUP Analysis

What Will It Take to Sustain OER Degree Pathways?

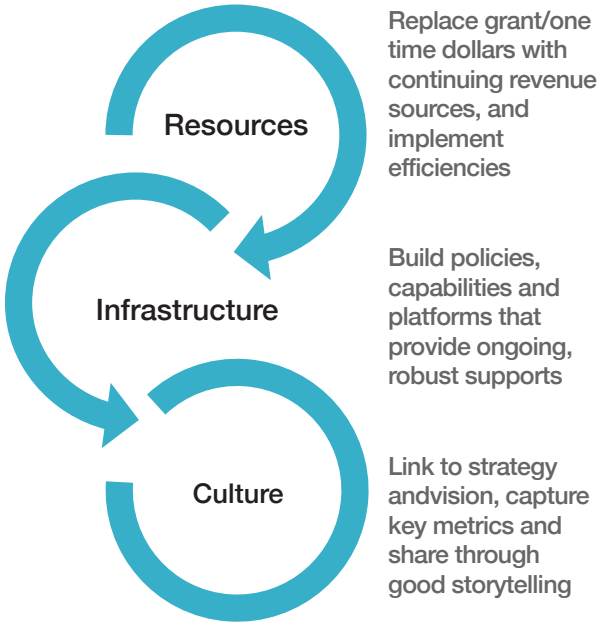
As colleges entered the final year of the grant, many were focused on OER sustainability plans for the postgrant period. We examine sustainability here using a three-part framework: resources, infrastructure, and culture (Figure 11).

Resources

One of the grantees' most pressing concerns is how to continue to support and scale the OER work that the grant stimulated. Colleges may consider OER course fees, and at least five grantees already have them in place. In some cases those fees are fully passed on to vendors offering access to OER materials. New fees can be difficult to implement because of approval procedures or outright prohibitions, a troubling sustainability concern in some situations. Colleges may be able to tap into existing technology or online fees to support OER programs.

Resources can also be found in the existing budget structures by reallocating resources–people, time, and dollars–to support OER. For example, some colleges now have designated OER librarians and/or trained instructional designers to support OER development. Our analysis of course development costs suggests that instructors are already reallocating a significant share of time from other activities. It is also possible that OER may help colleges generate new tuition through improvements in student performance and retention, although it is too early to make this claim. Research planned for the end of the OER grant evaluation will examine OER's impact on student outcomes and new potential revenue.

Figure 11. OER Sustainability Framework



Even when new revenues are unavailable, introducing efficiencies into OER development and delivery could lower costs. Some examples already been adopted by grantees include using librarians to search for OER materials, encouraging adoption of existing OER courses instead of customizing new sections, and communicating OER sections to the bookstore as part of the textbook adoption process to minimize administrative burdens and their associated costs.

Infrastructure

Framing OER as an organized approach to learning rather than a series of unconnected courses can advance the development of an OER infrastructure. This includes developing policies that outline appropriate OER licensing requirements, establishing processes for developing and maintaining OER courses, and setting common standards and expectations. Colleges can develop processes and platforms that embed OER into everyday operations, such as incorporating OER into job responsibilities, identifying OER courses in online catalogs, and developing tools for OER course development.

Sustaining OER will most likely require administrative oversight to perform such functions as recruiting and supporting faculty, identifying OER courses to be offered each term, coordinating and monitoring updates of course material, and supporting professional development. Some colleges have–or want–an OER coordinator position to provide these functions, whereas others may leverage existing infrastructure by embedding OER oversight into established centers (e.g., online learning or teaching and learning excellence).

Some grantees have identified how OER links to their strategic plan, which frequently addresses affordability for students. Grantees have been able to articulate connections with strategic goals and other student success initiatives at a high level (e.g., focus on affordability), but few have articulated specific ways in which connections between initiatives are operationalized. For example, one college is overhauling its advising system but has not yet incorporated OER training for new advisors. Some colleges may find it more feasible to implement various initiatives in parallel and then tie the threads together at a later stage.

Culture

Developing an OER culture is also critical to sustainability. Elements of this culture could include more emphasis on student-centered pedagogy, greater appreciation of the cost burden of traditional textbooks for students, and a shift in mindset about sharing intellectual property. An important indicator of culture change may be the spread of OER use by faculty beyond innovators to early adopters or even the early majority (to reference Everett Rogers' diffusion curve[15]). The values and priorities associated with culture shifts would probably need to be shared by administrators, and they might also be embraced by students.

Monitoring success metrics is also important; some colleges are looking at course outcomes to ensure that performance in OER sections is at least as good as in courses using traditional materials. Communicating those successes can reassure students and faculty that OER provides comparable quality and outcomes at a more affordable price. Finally, colleges will need to adopt incentive structures that connect OER to daily workflow and college life. Examples include building demonstration of OER competencies and successes into tenure and promotion reviews.

Sustainability of OER Degrees Versus OER Courses

The concept of OER degrees is appealing for a number of reasons. They can provide a framework for scaling up existing OER activity and building the infrastructure to sustain and organize this work. Degrees can serve as an ambitious point on the horizon to motivate participation and connect individual efforts to a larger vision. The cumulative

15 Rogers, E. M. (2003). Diffusion of innovations. New York: Free Press.

effect of taking multiple OER courses as part of a pathway may prove to be more impactful for students than a smattering of disconnected OER courses. And degrees can serve as a compelling marketing tool to attract new students.

This model appears to have gained more traction in some colleges than others. For some, offering OER degrees appears to have deep resonance with and the commitment of top administration, often because of branding benefits. For others, the future path of least resistance and greatest impact for OER proponents may be to focus on converting large-enrollment gateway courses. We heard that the "thin line" approach of having single OER sections in a pathway of courses would be hard to sustain.

Are OER Degrees Catalyzing Culture Change?

Many of the colleges we visited have made significant progress in laying the groundwork for sustainability, which is both an outcome of culture change and a necessary condition. As is often the case, changes in policies are easier to enact and measure than deeper changes in priorities and values. We were able to observe many instances of colleges working through the necessary and often painstaking steps to establish the infrastructure to support OER degrees; broader or deeper culture changes are harder to gauge.

When considering one of our research questions– whether OER degrees can bring about culture change – we observed that these initiatives appear to be important ingredients in culture changes already under way. Faculty and administrators pointed to OER as the "next logical step" in furthering goals such as student-centered pedagogy and increased affordability and access. In smaller colleges OER degrees appeared to be fairly high profile and could engage a substantial share of the faculty. In some large colleges OER initiatives tended to be competing for resources and attention with a broader range of student success initiatives and might take more time to permeate departments and campuses. In both cases OER initiatives seem more likely to be integral components of deep and sustained culture shifts than driving forces behind them.

Conclusions and Looking Ahead

The first 2 years of the ATD OER Degree Initiative have been productive. More than 71,000 students have enrolled in courses converted to OER through the initiative, saving them at least $6.5 million over 2 years. Colleges have worked through many of the nuts and bolts of implementations and are thinking seriously about ways to sustain these pathways after the grant period. A picture is beginning to emerge of the benefits and costs associated with launching these pathways. We found evidence that OER degrees are addressing at least some of the strategic goals colleges identified:

- *Affordability* – We estimate that on average students saved between $66 and $121 per course, with the lower number factoring in their typical purchasing behavior. Forty-one percent of students responded on the survey that OER courses have a significant impact on their ability to afford college.
- *Increased access and equity* – During focus groups multiple students cited the benefits of having immediate online access to instructional materials. The share of students who said that OER degrees will have a significant impact on their ability to afford colleges was higher for Pell Grant recipients and underrepresented minorities. Similarly, the share of students who say they had to drop a course because they could not afford required materials was higher for minorities.
- *Improved curriculum and pedagogy* – We did not find evidence that instructors are changing teaching practices due to use of OER. A number of instructors did, however, report that using OER enabled them to better align their course materials with learning objectives and that they were more intentional about assignments. Faculty members at almost all colleges reported greater student engagement due to more contemporary and relevant materials. Students mirrored their reports, saying OER materials were better aligned with course outcomes and more engaging than traditional textbooks.
- ***Decreased time to degree*** – It is too soon to say whether students who take multiple OER courses will progress more quickly and successfully. Although some instructors saw signs of greater engagement, they generally did not claim to see differences in course outcomes. Few students said they were likely to perform better in OER courses.

In fall 2018, the final term in the program, grantee colleges aim to complete any remaining courses in their OER degree pathways and continue working through the nuts and bolts of implementation and developing plans for sustainability.

In the last year of the project SRI will conduct quasi-experimental studies with research partner colleges to address this last question–i.e., the academic impacts of OER degrees. We will also conduct an additional cycle of enrollment and cost data collections and another iteration of the instructor survey. The latter will help us gauge whether the population of instructors has grown and diversified and whether their perspectives on OER degrees have evolved since 2016. A final report will be released in fall 2019.

Appendix A: Data Collection and Analysis Details

Student Survey

The purpose of the student survey was to collect information about the students who participated in the OER degree pathways and to investigate their experiences with and perceptions of OER thus far. Described here are the methods used to analyze survey results and the overall survey results by item. SRI worked with 12 colleges to administer the online survey at their institutions. The survey was administered to all students enrolled in one or more of a sample of OER degree courses at each college in fall 2017. SRI systematically chose a sample of courses and sections at each college that:

- Would achieve a target of 300 completed surveys per school (where possible)
- Would be offered during the survey window (mid-October through mid-December 2017)
- Would be representative of multiple disciplines (e.g., STEM, liberal arts, business) and of degrees offered at the college
- Preferably were certified by Lumen Learning

Only students age 18 or older were allowed to participate. For schools that had an exceptionally large number of OER courses and students that qualified for the survey, we aimed to sample no more than three sections of any course to avoid overrepresentation. Each college reviewed its sample of courses and sections before survey administration to ensure that it was representative of the OER degree courses offered and did not contain unusual or biased sets of courses. The course sample was updated based on the college's recommendations.

To maximize student participation, instructors were asked to administer the online survey during class time when possible. A detailed set of instructions for online and face-to-face courses was developed for grantees to give to course instructors. The survey could be taken on laptops or smartphones. Students received a $10 Amazon gift card for participating in the survey. Because it is burdensome for instructors to provide class rosters, an anonymous survey link was used. Several measures were taken to prevent and exclude fraudulent survey responses, such as matching IP address and location and filtering out web-generated email domains. However, this did not guarantee complete elimination of all fraudulent responses.

Two versions of analyses were conducted using SAS 9.4: unweighted descriptive statistics and descriptive statistics weighted by the number of respondents in each college. For each method the sample sizes, means, and standard deviations of each survey item are provided.

For the unweighted descriptive statistics, sample sizes were reported as the number of participants who responded to each item. When the response was a continuous variable–e.g., "On a scale from 0 to 10 (0 being *not at all likely,* and 10 being *very likely*), how likely are you to recommend taking this OER course to a friend?")–the means were calculated as the sum of the scores divided by the number of respondents (excluding participants who did not respond to this specific item). When the response was a categorical variable–e.g. "What type of textbooks do you usually purchase? A. New, printed textbooks; B. Used, printed textbooks; C. Rental, printed textbooks; D. Online or digital textbooks")–each option was coded as either 1 or 0 (e.g., "1 for "New, printed textbooks" represented that a

respondent chose this option, and 0 for "Online or digital textbooks" indicated that a respondent did not select this option). Then the means of the options were calculated as the sum of the scores for a specific option divided by the number of respondents (excluding participants who did not respond to this specific item).

For the weighted descriptive statistics, similar procedures were used, but the means and standard deviations were weighted by the number of participants in each college. Specifically, the weights were calculated as the expected number of participants per college divided by the actual number of participants from each college. In this formula, the expected number of participants was calculated as the total number of participants in the survey (2,441) divided by the total number of colleges in the survey (12), yielding an expected number of participants of 203.42. The actual number of participants from each college stayed the same within a college, so participants in one college were given the same weights. For example, one college had 111 respondents, so the weight for each respondent from that college was 203.42/111, or 1.83. Using this method, we increased the weight for colleges with a small number of respondents, so that each college had the same weight in the survey. When we obtained the frequency weights by colleges, we applied them to each individual item of the survey, allowing us to compare the results across items in the survey.

Site Visits

SRI developed structured interview protocols for interviews with instructors, administrators, librarians, and IT directors if they were involved with the implementation of the OER degree. We sought assistance from site coordinators in identifying appropriate participants and recruiting students for focus groups. Table A1 shows the participants at each site.

The analysis focused on the interview data. We did not include the observation data because observations were not conducted at all sites and the number of observations was insufficient to make meaningful interpretations.

The site visitors compiled all interview data into structured observation debriefs. If more than one interview was conducted for a particular type of interview subject (e.g., instructor), summaries were created for multiple responses for each question. The summaries documented themes across interviewees as well as the range of responses if they differed markedly from one another. Responses and summaries of multiple responses from all interviewees were then organized into 20 debrief categories that in turn were organized under 9 themes: Rollout, Recruitment, & Messaging; Engagement & Access; OER Perceptions; Degree & Course Development; Time Commitment; Implementation; Support; Cost; and Sustainability. One analyst arranged all sites' sets of debrief category data alongside one another and conducted a cross-site comparative analysis to look for common themes, the range of differences among sites, and instances of unusual or otherwise notable practices, perceptions, or circumstances. The analyst then generated claims and explanations related to the 10 themes to answer the research questions. These claims and explanations were shared with site visitors who had intimate familiarity with the site data and the context of the data collection and could check the claims for accuracy.

Table A1. Site Visit Data Collections

	Interviews			
	Administrators	**Instructors**	**Students**	**Classroom Observations**
Fall 2017 Site Visit Colleges				
A	4	2	6	2
B	2	1	7	1
C	3	2	7	1
D	6	5	4	1
E	5	1	6	2
F	6	2	8	1
Spring 2018 Site Visit Colleges				
G	7	2	6	2
H	3	2	9	2
I	6	3	4	2
J	5	2	4	0
K	4	3	7	2
Total	**51**	**25**	**68**	**16**

Appendix B: Student Survey Results (All Students)

Q1.	Which of the following technologies or devices do you have access to when you are off campus? (Select all that apply.)	Overall Results (*n* = 2,440)
	a. Desktop	91%
	b. Tablet	35%
	c. Internet	73%
	d. Smart phone	82%
	e. None of these	0%

Q2.	To what extent does your access to technology and/or the internet impact your ability to complete assigned coursework? (Select one.)	Overall Results (*n* = 2,438)
	a. No impact	15%
	b. Some impact	23%
	c. Large impact	62%

Q3.	How would you describe your level of comfort using technology for a course (e.g. for online homework or online course website/syllabus)? (Select one.)	Overall Results (*n* = 2,439)
	a. Not at all comfortable	1%
	b. Somewhat uncomfortable	4%
	c. Neutral	12%
	d. Somewhat comfortable	24%
	e. Very comfortable	59%

Q4.	How many courses are you taking this semester?	Overall Results (*n* = 2,430)
	Average number of courses:	3.54

Q5.	How much money *per course* do you typically spend on textbooks or materials? (Select one.)	Overall Results (*n* = 2,430)
	a. $0-50	13%
	b. $51-100	27%
	c. $101-150	30%
	d. $151-200	17%
	e. Over $200	14%

Q6.	Where do you purchase most of your textbooks?	Overall Results (*n* = 2,429)
	a. College bookstore (in store or online)	56%
	b. A website not affiliated with the college	32%
	c. I do not usually purchase textbooks	6%
	d. Other	6%

Q7.	What type of textbooks do you usually purchase?	Overall Results (*n* = 2,281)
	a. New, printed textbooks	22%
	b. Used, printed textbooks	38%
	c. Rental, printed textbooks	32%
	d. Online or digital textbooks	8%

Q8.	Have there been times that you did not purchase or rent the *required* textbook or materials for a course? (Select one.)	Overall Results (*n* = 2,416)
	Yes	53%
	No	47%

Q9.	*[If student responded "no" to Q8]* Thinking specifically about the last time you did not purchase or rent the required textbooks or materials for a course, what were the reasons you did not purchase or rent them? (Select all that apply.)	Overall Results (*n* = 1,289)
	a. I could not afford the textbooks or materials	45%
	b. I borrowed someone else's textbook or materials	26%
	c. I used the library's textbook or materials	17%
	d. The textbook was online and free	49%
	e. The instructor did not assign reading from the textbook	33%
	f. I don't typically do textbook reading assignments	5%
	g. I don't typically use course materials	2%
	h. Other	4%

Q10.	How often do you typically do assigned readings in a course? (Select one.)	Overall Results (*n* = 2,409)
	a. Never	2%
	b. Sometimes	14%
	c. About half of the time	15%
	d. Most of the time	41%
	e. Always	27%

Q11.	Have you ever withdrawn from a course because you could not afford the required textbooks or materials? (Select one.)	Overall Results (*n* = 2,406)
	a. Yes	12%
	b. No	85%
	c. Not sure	3%

Q12.	Including this course, how many college courses have you taken or are you taking that used only online and free course texts or materials? (Select one.)	Overall Results (*n* = 2,407)
	a. 1	38%
	b. 2	28%
	c. 3	15%
	d. 4	7%
	e. 5	2%
	f. 6	1%
	g. 7 or more	2%
	h. Not sure	7%

Q13.	Were you aware that [Selected Course(s)] was OER when you registered for it? (Select one.)	Overall Results (*n* = 2,396)
	a. Yes	34%
	b. No	59%
	c. Not sure	7%

Q14.	How did you find out that [Selected Course(s)] was OER? (Select all that apply.)	Overall Results (*n* = 2,381)
	a. It was indicated in the course name/next to the course name when I registered.	24%
	b. It was indicated in the course syllabus.	30%
	c. A friend told me.	4%
	d. A college instructor/advisor told me.	34%
	e. I saw an advertisement on my college's website.	2%
	f. I found out **after** I had registered.	27%
	g. I did not know that this course was OER until taking this survey.	19%
	h. Other	1%

Q15.	To what extent did the following factors influence your decision to enroll in [Selected Course(s)]? (Select one per row.)	Overall Results (*n* = 2,352)
	a. Required for my major	
	i. No influence	11%
	ii. Some influence	19%
	iii. Strong influence	71%
	b. Fits with my schedule	
	i. No influence	11%
	ii. Some influence	30%
	iii. Strong influence	59%
	c. Personal interest	
	i. No influence	30%
	ii. Some influence	41%
	iii. Strong influence	29%
	d. Instructor reputation	
	i. No influence	45%
	ii. Some influence	27%
	iii. Strong influence	28%
	e. Recommended by a friend/classmate	
	i. No influence	71%
	ii. Some influence	17%
	iii. Strong influence	12%
	f. Encouraged by advisor or other faculty member at any institution.	

Q15.	To what extent did the following factors influence your decision to enroll in [Selected Course(s)]? (Select one per row.) CONTINUED	Overall Results (*n* = 2,352)
	i. No influence	49%
	ii. Some influence	28%
	iii. Strong influence	23%
	g. Cost savings	
	i. No influence	55%
	ii. Some influence	22%
	iii. Strong influence	23%
	h. Course format (e.g. online vs. face-to-face)	
	i. No influence	32%
	ii. Some influence	27%
	iii. Strong influence	41%
	f. Other	
	i. No influence	84%
	ii. Some influence	8%
	iii. Strong influence	8%

Q16.	Please rate your experience in [Selected Course/Choice Group/Selected Choices] as compared to other typical, non-OER courses you are taking this semester. (Select one per row)	Overall Results (*n* = 2,350)
	a. Quality of teaching, compared to typical class.	
	i. Much lower	2%
	ii. Slightly lower	5%
	iii. About the same	36%
	iv. Slightly higher	26%
	v. Much higher	31%
	b. Quality of instructional materials, compared to typical class.	
	i. Much lower	2%
	ii. Slightly lower	5%
	iii. About the same	34%
	iv. Slightly higher	29%
	v. Much higher	30%
	c. Level of student engagement/participation in course, compared to typical class.	
	i. Much lower	2%
	ii. Slightly lower	7%

Q16.	Please rate your experience in [Selected Course/Choice Group/Selected Choices] as compared to other typical, non-OER courses you are taking this semester. (Select one per row) CONTINUED	Overall Results (*n* = 2,350)
	iii. About the same	36%
	iv. Slightly higher	24%
	v. Much higher	30%
	d. Overall quality of learning experience, compared to typical course.	
	i. Much lower	2%
	ii. Slightly lower	5%
	iii. About the same	32%
	iv. Slightly higher	28%
	v. Much higher	33%

Q17.	How often do you experience the following problems accessing online course materials for [Selected Course/Choice Group/Selected Choices]? (Select one per row.)	Overall Results (*n* = 2,353)
	a. Lack of access to devices (e.g. computer)	
	i. Never	72%
	ii. Sometimes	19%
	iii. About half of the time	5%
	iv. Most of the time	2%
	v. Always	1%
	b. Lack of access to the internet	
	i. Never	65%
	ii. Sometimes	26%
	iii. About half of the time	5%
	iv. Most of the time	3%
	v. Always	1%
	c. Problems logging into/accessing online materials	
	i. Never	70%
	ii. Sometimes	22%
	iii. About half of the time	5%
	iv. Most of the time	2%
	v. Always	1%
	d. Problems using online materials (e.g. difficulty of reading texts onscreen)	

Q17.	How often do you experience the following problems accessing online course materials for [Selected Course/Choice Group/Selected Choices]? (Select one per row.) CONTINUED	Overall Results (*n* = 2,353)
	i. Never	68%
	ii. Sometimes	22%
	iii. About half of the time	6%
	iv. Most of the time	3%
	v. Always	1%
	e. Other	
	i. Never	86%
	ii. Sometimes	4%
	iii. About half of the time	5%
	iv. Most of the time	2%
	v. Always	2%

Q18.	What percent of the [Selected Course(s)]'s materials do you print out?	Overall Results (*n* = 2,345)
	a. 0-25%	63%
	b. 26-50%	16%
	c. 51-75%	9%
	d. 76-100%	11%

Q19.	Have you purchased printed copies of course materials for [Selected Course(s)] (e.g. course packets)?	Overall Results (*n* = 2,342)
	a. Yes, I was REQUIRED to purchase print copies.	3%
	b. Yes, I CHOSE to purchase print copies.	10%
	c. No.	87%

Q20.	Did you have to pay additional fees (e.g. access, support, or technology fees) to enroll in [Selected Course/Choice Group/Selected Choices]? (Select one.)	Overall Results (*n* = 2,347)
	Yes	14%
	No	86%

Q21	What challenges (if any) have you encountered using the course materials for [Selected Course(s)]? (Select all that apply.)	Overall Results (*n* = 2,330)
	a. Materials are not relevant to the course content.	3%
	b. Difficulty using course materials.	5%
	c. Difficulty accessing course materials.	5%
	d. Course materials are not engaging.	10%
	e. Difficulty learning from course materials.	13%
	f. None.	72%
	g. Other.	3%

Q22.	Are you aware of other OER courses offered through your college? (Select one.)	Overall Results (*n* = 2,347)
	Yes	42%
	No	58%

Q23.	How much of an impact will OER courses have on your ability to afford college? (Select one.)	Overall Results (*n* = 2,340)
	a. Significant impact	41%
	b. Moderate impact	28%
	c. Little impact	13%
	d. No impact	6%
	e. I don't know	12%

Q24.	How have you, or do you plan to, use the savings from not having to purchase course materials? (Select all that apply.)	Overall Results (*n* = 2,319)
	a. Work fewer hours on or off campus	14%
	b. Take additional courses	28%
	c. Purchase materials or supplies for other courses	43%
	d. Cover college tuition and/or fees	50%
	e. Cover personal expenses (e.g. going out to eat, paying bills, etc.)	48%
	f. Other	3%

Q25.	How do you pay for college tuition and fees? (Select all that apply.)	Overall Results (*n* = 2,328)
	a. Pell Grant	37%
	b. Merit scholarship	7%
	c. Student loans	22%
	d. Family	33%
	e. Self-funded	34%
	f. Other grants/scholarships	17%

Q26.	How many credits are you taking this semester/term?	Overall Results (*n* = 2,295)
	a. 1	0%
	b. 2	1%
	c. 3	5%
	d. 4	4%
	e. 5	2%
	f. 6	8%
	g. 7	4%
	h. 8	3%
	i. 9	8%
	j. 10	6%
	k. 11	3%
	l. 12 or more	56%

Q27.	Are you an early college or dual enrollment student (e.g. are you currently enrolled in high school and taking one or more college courses)?	Overall Results (*n* = 2,323)
	Yes	13%
	No	87%

Q28.	Have you ever had to stop taking courses for a semester or more because you could no longer afford them? (Select one.)	Overall Results (*n* = 2,330)
	Yes	16%
	No	84%

Q29.	In total, how many college semester or terms have you completed so far, including any terms completed at other colleges? (Select one.)	Overall Results (*n* = 2,326)
	a. 0	22%
	b. 1	11%
	c. 2	17%
	d. 3	15%
	e. 4	10%
	f. 5 or more	25%

Q30.	What have most of your final term/semester grades been up until now at this college? (Select one.)	Overall Results (*n* = 2,324)
	a. A	32%
	b. B	37%
	c. C	11%
	d. D or lower	1%
	e. I have not yet received any final term/semester grades.	20%

Q31.	On a scale from 0 to 10 (0 being not at all likely, and 10 being very likely), how likely are you to enroll in an OER Course in the future?*	Overall Results (*n* = 2,314)
	a. 1 -- not at all likely	1%
	b. 2	0%
	c. 3	1%
	d. 4	1%
	e. 5	1%
	f. 6	11%
	g. 7	4%
	h. 8	11%
	i. 9	12%
	j. 10 -- very likely	8%

** Scales such as those used in Q31 and Q32 are used to calculate net promoter scores, which measure whether responders are willing to recommend a product or service (in this case OER courses) to others. Respondents with scores of 0-6 are detractors: they are not enthusiastic about OER courses and may undermine future growth through negative word of mouth. Respondents with scores of 7-8 are passives: satisfied but not excited about OER courses. Respondents with scores of 9-10 are promoters: positive about OER courses and likely to recommend them to others.*

Q32.	On a scale from 0 to 10 (0 being not at all likely, and 10 being very likely), how likely are you to recommend taking an OER Course to a friend?	Overall Results (*n* = 2,312)
	a. 1 -- not at all likely	1%
	b. 2	0%
	c. 3	1%
	d. 4	2%
	e. 5	2%
	f. 6	10%
	g. 7	5%
	h. 8	8%
	i. 9	13%
	j. 10 -- very likely	8%

Q33.	What is your year of birth?	Overall Results (*n* = 2,265)
	Average year of birth	1994

Q34.	What is your gender identity? (Select one.)	Overall Results (*n* = 2,302)
	a. Male	35%
	b. Female	63%
	c. Prefer not to self-describe	1%
	d. Prefer not to answer	1%

Q35.	What is your race/ethnicity? (Select all that apply.)	Overall Results (*n* = 2,303)
	a. American Indian or Alaska Native	2%
	b. Asian	12%
	c. Black or African American	12%
	d. Hispanic or Latino	33%
	e. Native Hawaiian or Other Pacific Islander	1%
	f. White	45%
	g. Other	2%
	h. Prefer not to respond	3%

Q36.	How many hours per week are you currently working? (Select one.)	Overall Results (*n* = 2,303)
	a. 0-10 hours	10%
	b. 11-20 hours	17%
	c. 21-30 hours	19%
	d. 30 or more hours	27%
	e. I am not currently employed	27%

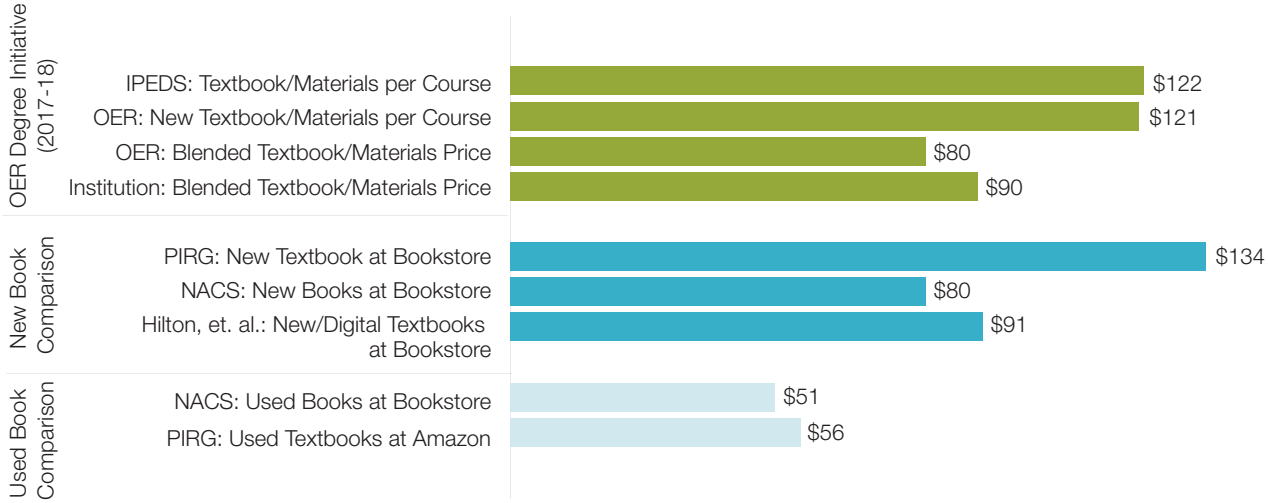
Q37.	Are you a member of the U.S. Armed Forces, Reserves, or National Guard? (Select one.)	Overall Results (*n* = 2,304)
	Yes	3%
	No	97%

Appendix C: Cost Analysis Detail

Presented here is additional information about the estimates of textbook pricing used in analyses of the cost savings per student. The orange bars in Figure C1 represent different types of textbook prices calculated from data the grantees provided. The Integrated Postsecondary Education Data System (IPEDS) price includes the annual cost of books and supplies reported to IPEDS (with an adjustment to exclude supplies) on a per-course basis. The OER new textbook price reflects the price of new textbooks/ materials for traditional sections of Lumen Learning-certified OER courses. The two blended textbook prices reflect student purchasing patterns and include new, used, rental, and digital purchases; they are based on actual bookstore sales divided by units sold, both for the institution overall and for traditional sections of Lumen-certified OER courses.

The gray bars show comparative prices from the literature. The acronyms reference the three studies listed in the source section at the bottom. PIRG is the Public Interest Research Group, which conducts research on issues of importance for the public. NACS is the National Association of College Stores.

Figure C1. Average Prices of OER Textbooks Relative to Traditional New and Used Books



Sources: Institutional Cost Data; rpk GROUP Analysis Hilton III, John Levi, T. Jared Robinson, David Wiley, and J. Dale Ackerman. 2014. "Cost-savings Achieved in Two Semesters Through the Adoption of Open Educational Resources." The International Review of Research in Open and Distributed Learning. *Vol. 15. No. 2 (April).*
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Table C1: Student Savings Estimates for OER Degree Initiative Students

Two-Year Total (2016-17 and 2017-18)		
	Savings estimates reflect enrollment in Lumen Learning-certified ATD Degree Pathway courses only	
	Scenario 1	**Scenario 2**
Student textbook/course materials savings	$12.3m	$7.2m - $7.3m
Offsets to savings		
OER fees	$189k - $298k	$189k - $298k
OER printed texts/course packs for purchase	$116k - $425k	$116k - $425k
Net savings to students	$11.6m - $12.0m	$6.5m - $7.0m
Average savings per OER student enrollment	$117 - $121	$66-$71
Average savings per OER section	$2,900 - $3,000	$1,600 - $1,700
Average savings per institution	$386k - $400k	$216k - $233k

Scenario 1: All OER students purchase new textbooks from college bookstore.
Scenario 2: Some OER students purchase new/used/rental/digital texts from college bookstores; some purchase used textbooks online; some students do not purchase textbooks.
Source: Institutional Cost Data; rpk GROUP Analysis

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