# OPEN EDUCATIONAL RESOURCES:

## *A New* High-Impact Practice

# APPENDICES

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1818 R Street NW, Washington, DC 20009

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# Appendix A: Methodology

## INSTITUTIONAL RECRUITMENT

We identified potential institutional collaborators through several considerations. First, using data shared with us from OpenStax, we identified institutions that had adopted seven or more OpenStax textbooks in AY 2022-23. From this dataset, we sorted the institutions into six Carnegie-derived categories—community colleges (2-year institutions), tribal colleges, HBCUs, regional public 4-year institutions, private 4-year institutions, and Doctoral Universities—in order to identify three institutions for each of the six institutional classifications. Institutions with high student enrollment in courses with an adopted OER textbook were prioritized. We also identified potential sites in under-represented Carnegie categories from previous participants of AAC&U's Institute on Open Educational Resources.

For each institution identified as a potential partner site, we researched and contacted a representative on campus who was publicly listed as someone advancing OER on their campus. These individuals included librarians, center for teaching and learning staff, deans, provosts, and faculty members. We conducted 30-minute interviews with each potential liaison to determine if the institution was a good fit for the research study. A total of 39 institutions were invited to interview. Of those, 24 participated in an interview and, subsequently, 20 were invited to participate in the study, and 17 accepted. We then invited liaisons from each institution to a grant convening in Atlanta, Georgia in March 2024, where we outlined the research plan in detail, ensuring institutional liaisons understood their roles while also having an opportunity to contribute their ideas and expertise to the study design. Ultimately, two institutions dropped out of the study post-convening, resulting in a total of 15 institutions that participated fully, submitting and contributing to all participation requirements.

## DATA COLLECTION AND ANALYSIS

This study included four main data sources: (a) institutional questionnaires; (b) course, student, and instructor data; (c) focus group interviews; and (d) an instructor survey.

### Institutional Questionnaires

At the beginning of the study, we requested that liaisons respond to a questionnaire regarding their campus OER activities and policies to help us contextualize the other data we planned to collect. Questions addressed (a) OER initiatives on campus; (b) whether OER was written into institutional missions, values, or strategic plans; (c) state-wide efforts their institution participated in; (d) the status of OER implementation on their campus; (e) estimated cost savings for students; (f) OER-related professional development opportunities; and (g) perceived barriers to OER implementation. We also included questions related to OER status during the COVID-19 pandemic and, following

liaison suggestions, questions regarding other significant events (e.g., hurricanes, flooding) that may have resulted in temporary policy changes during relevant semesters.

### *Course, Student, and Instructor Data*

**Collection and Cleaning.** Institutional liaisons were responsible for first identifying which courses on their campus utilized OER and during which semester the change from a traditional textbook to OER occurred. They then connected with the appropriate departments and individuals on campus to collect historical data from those courses during all relevant semesters—including winter and summer intersessions—falling between the fall of 2014 and the fall of 2024.

## Institutional Questionnaire Protocol

The purpose of this questionnaire is to gather institution-level information about the implementation of OER and OEP on your campus. Additionally, we are interested in understanding how the COVID-19 pandemic impacted campus operations and policy. Please answer all questions to the best of your ability. You may find it useful to connect with other faculty members, departments, provosts, and other administrators on your campus to answer these questions fully. We thank you for your time providing thoughtful, detailed answers to these questions.

1. Is there a statewide OER initiative in your institution's home state? If so, please describe the initiative and how it has impacted the implementation of OER or OEP on your campus.
2. Is there an OER policy at your institution? If yes, describe or summarize the policy **and** provide a link.
3. Does OER factor into your institution's mission, strategic plan, tenure and promotion decisions, etc.? If yes, describe or summarize **and** provide links, if applicable.
4. Is there a dedicated individual, committee/team, office, or department from which the OER initiative stems? (e.g., library, center for teaching and learning, etc.) If yes, list the department **and** provide a link to their OER page, if applicable.
5. How widely are OER used on your campus? Consider the following questions in your response.
    a. Are OER used widely across the institution?
    b. Is adoption of OER program-based, and thus, implemented in silos?
    c. Are OER used more in specific courses and not organization-wide?
6. Do you offer professional development around OER on your campus? If yes, describe the opportunities.
7. What is the estimated cost-savings of implemented OER at your institution?
8. Have there been any significant roadblocks or issues to contend with around the larger OER initiative at your institution? If yes, describe briefly.
9. Briefly tell us about your institution's OER initiative. This should be a general summary that tells your institution's OER story (think OER elevator pitch).
10. Was the pandemic a driver for the adoption of OER at your institution? If yes, describe.
11. What policies were put into place at your institution due to/during the pandemic? Consider grading policies, withdrawal policies, student choice on course modality, enrollment rates, etc.

The following tables show all variables we endeavored to collect from each institution.

## Codebook: Course Variables

| Variable Name | Definition |
|---|---|
| CourseName | Full descriptive name of the course. |
| CourseYear | Calendar year in which the course took place, 4-digit numeric value (YYYY). |
| CourseTerm | Term in which the course took place. |
| CourseLevel | The associated numeric value of the course. |
| CourseDiscipline | The associated discipline of the course as categorized in the "Disciplinary Areas" outlined by the National Survey of Student Engagement (NSSE; https://nsse.indiana.edu/fsse/survey-instruments/main-survey/disciplinary-areas.html). Please indicate the number of the category that most closely aligns with the course discipline. See the "Disciplinary Areas" tab in this codebook. |
| CourseModality | The associated mode in which the course took place. The response options are defined as follows.<br>**Face to Face:** the instructor and students were in the same physical location at the same time.<br>**Hybrid:** The course implemented a combination of in-person and online instruction.<br>**Hyflex:** The course enabled a flexible participation policy where students chose to engage in-person or via online opportunities.<br>**Online – asynchronous**: The course was fully online, and students engaged with course content and completed learning activities on their own time.<br>**Online – synchronous:** The course was fully online, and students engaged with course content and completed learning activities at the same time.<br>**Online – combined:** The course was fully online and incorporated a mix of synchronous and asynchronous components. |
| InstructionType | The associated method of instruction for the course. |
| STEM_NonSTEM | Indicates whether the course is considered a STEM (science, technology, engineering, or mathematics) course at your institution. |
| FYE | Indicates whether the course is part of first year experience programming at your institution. |
| GenEd | Indicates whether the course is part of the general education curriculum at your institution. |
| OER_OEPIncorporated | Indicates whether the course incorporated OER or OEP to any degree. Include courses that were tagged as "no cost" at your institution. |
| OERType | Indicates the type of OER resource that was implemented in the course. The response options are defined as follows:<br>**OER textbook**: The primary resource for the course is a textbook that is openly licensed and free for students to use electronically. Can be printed at a cost, but students would have access on the first day to the electronic copy.<br>**Zero cost**: The instructor uses resources that incur no cost to the student, but the resources are not traditionally considered a textbook (e.g., library resources, sources from the web that are free but not openly licensed, students creating open resources).<br>**Low cost**: Students are required to purchase low-cost materials for the course (e.g., calculators, lab-safety equipment, homework access, or other inexpensive resources). |

## Codebook: Course Variables (Continued)

| Variable Name | Definition |
|---|---|
| OERMaterialCost | If the OER Type was "low cost," indicate the cost of the required materials in U.S. dollars. Please round up to the nearest dollar amount. If the OER Type was "OER textbook" or "zero cost," leave blank. |
| OER_OEPTag | Indicates whether the course was tagged to indicate to students that OER or OEP were incorporated in the course. Include courses that were tagged as "no cost" if students had access to this tag. If the course did not incorporate OER or OEP, enter "Not Applicable." |
| CourseGrade | Alpha-value representing the student's final grade in the course; this may include the appropriate +/- symbols as needed. |
| CourseWithdrawal | Indicates whether the student withdrew enrollment in the course. |
| OERMaterialCost | If the OER Type was "low-cost," indicates the cost of the required materials in U.S. dollars. Please round up to the nearest dollar amount. If the OER Type was "OER textbook" or "zero-cost," leave blank. |
| CourseGrade | Alpha-value representing the student's final grade in the course; this may include the appropriate +/- symbols, as needed. |
| CourseWithdrawal | Indicates whether the student withdrew enrollment in the course. |

## Codebook: Student Variables

| Variable Name | Definition |
|---|---|
| StudentID | Unique alpha-numeric value for each student. Please create an 8-digit proxy ID number for each student using the following format: 2-digit Site ID (provided by AAC&U) followed by 6-digit student ID. Do not use actual student ID numbers. (Note: You will also create a separate key that maps each student's proxy ID to their personal information.) |
| BirthDate | Student's date of birth as an 8-digit numeric value (MM/DD/YYYY). |
| Race/Ethnicity | Student's race or ethnicity based on the categories used in IPEDS. |
| Sex | Student's sex as specified by the student. If the student's sex changed over time, please provide the last known sex. |
| PellEligibility | Indicates whether the student was eligible for a Pell Grant at any point during their enrollment. |
| FirstGen | Indicates whether the student was the first in relation to their parent(s) and/or legal guardian(s) to attend college. |
| EnglishLearner | Indicates whether the student's primary or home language is other than English. This includes students designated as EL, ELL, or ESL. |

## **Codebook: Student Variables** (Continued)

| Variable Name | Definition |
|---|---|
| TotalCreditsAttempt | The total number of credit hours the student attempted prior to the term in which the course of study was taken. Leave blank if unknown. |
| TotalCreditsEarned | The total number of credit hours earned prior to the term in which the course of study was taken. Leave blank if unknown. |
| TermCreditsAttempt | The total number of credit hours the student attempted during the term in which the course of study was taken. Leave blank if unknown. |
| TermCreditsEarned | The total number of credit hours the student successfully completed (earned) during the term in which the course of study was taken. Leave blank if unknown. |
| Zipcode | Five-digit zip code where the student resided PRIOR TO enrollment at your institution. This information may be found in each student's application for admission or other similar documentation. Leave blank if unknown. |
| SATScore | Composite score of student's SAT result. Leave blank if the student does not have an SAT score. |
| ACTScore | Composite score of student's ACT result. Leave blank if the student does not have an ACT score. |
| HighSchoolGPA | Numeric value on a 4-point scale of student' high school GPA, rounded to two decimal places. Leave blank if unknown. |
| TransferGPA | Numeric value of student's transfer GPA on a 4-point scale, rounded to two decimal places. Leave blank if not applicable or unknown. |
| DropOut | Indicates whether the student withdrew enrollment at your institution. |
| TransferOut | Indicates whether the student transferred out of your institution to another institution. |
| DegreeCompletion | Indicates the amount of time (in number of semesters) the student took from enrollment to degree completion. |
| TerminalGPA | Final GPA upon graduation from your institution. Includes numeric value on a 4-point scale, rounded to two decimal places. Leave blank if the student has not graduated. |
| AdmissionDate | Student's date of admission/enrollment at your institution (MM/DD/YYYY). |
| CompletionDate | Student's date of leaving your institution—graduation date, transfer date, drop-out date (MM/DD/YYYY). Leave blank if the student is still enrolled. |
| OER_OEPCourses | Total number of courses taken by the student that incorporated OER or OEP, including courses that were tagged as "no cost." |

## Codebook: Instructor Variables

| Variable Name | Definition |
|---|---|
| InstructorID | Unique alpha-numeric value for each course instructor. Please create a 6-digit proxy ID number for each course instructor using the following format: 2-digit Site ID (provided by AAC&U) followed by 4-digit instructor ID. Do not use their actual employee ID/university ID. (Note: You will also create a separate key that maps each instructor's proxy ID to their personal information.) |
| InstructorStatus | Course instructor's primary role during the term in which the course was offered. |
| InstructorExperience | Number of years the course instructor had been employed at the institution (in any position) at the time the course was offered. |
| CurrentInstructor | Indicates whether the instructor is currently employed at the institution (in any position) as of the Spring 2024 semester. |

Once an institutional liaison submitted their data for review, we first cleaned the data to ensure that only instructors that taught each included course for at least two semesters pre- and post-OER adoption were included in the final dataset. In many cases, it was easier for the liaison to submit all data from a single course number rather than by instructor, especially in cases where a department had a standardized approach to incorporating the same OER text across course sections. Thus, there were records to remove that did not align with the study design. We then removed any records from students who were under the age of 18 at the time of the course. Lastly, we removed records with any grade that did not impact a student's GPA (e.g., Pass/Fail, Satisfactory/Unsatisfactory, medical withdrawals, COVID-19 withdrawals) based on each institution's grading system.

From the 15 participating institutions, we collected 1,553,301 historical student records from Fall 2014 to Fall 2024. The initial data screening described above reduced the total number of student records to 697,363, with institution-level data retention rates ranging from 25%-94%.

### *Data Analysis*

We used multiple analyses to examine the data, which were guided by the nature of each research question. All data were analyzed using R version 4.5.1 (R Core Team, 2026).

#### *RQ1: Is there a relationship between OER implementation and student success in a course taught by the same instructor prior to and after OER implementation?*

**Withdrawal Rates.** We began with logistic regression analysis to examine the relationship between course withdrawal (as a binary outcome) and OER implementation to demonstrate what can happen if we ignore the underlying structure of the data. Given the nested structure of the data (i.e., students nested within courses nested within institutions), we then estimated a three-level hierarchical logistic regression model using the lme4 package (Bates et al., 2015) as follows:

## Final Hierarchical Model

**Level 1:**

$$\text{logit}(P(CourseWithdrawal_{ijk} = 1)) = \beta_{0jk} + \beta_{1jk}\,(\text{CLC}_{ijk})$$

**Level 2:**

$$\beta_{0jk} = \gamma_{00k} + \gamma_{01k}\,(\text{OERImplemented}_{jk}) + u_{0jk}$$
$$\beta_{1jk} = \gamma_{10k} + \gamma_{11k}\,(\text{OERImplemented}_{jk})$$

**Level 3:**

$$\gamma_{00k} = \delta_{000} + \delta_{001}\,(\text{InstitutionType}_{k}) + v_{00k}$$
$$\gamma_{01k} = \delta_{010} + \delta_{011}\,(\text{InstitutionType}_{k})$$
$$\gamma_{10k} = \delta_{100} + \delta_{101}\,(\text{InstitutionType}_{k})$$
$$\gamma_{11k} = \delta_{110} + \delta_{111}\,(\text{InstitutionType}_{k})$$

**Where:**

$\beta_{0jk}$ = average log-odds of withdrawal rate for course *j* at institution *k*
$\beta_{1jk}$ = effect of CLC on log-odds of withdrawal for course *j* at institution *k*
$\gamma_{00k}$ = average log-odds of withdrawal for institution *k*
$\gamma_{01k}$ = effect of OER Implemented on log-odds of withdrawal for institution *k*
$\gamma_{10k}$ = average effect of CLC across all courses for institution *k*
$\gamma_{11k}$ = cross-level interaction between OER Implemented and CLC for institution *k*
$\delta_{000}$ = average log-odds of withdrawal across all institutions
$\delta_{001}$ = effect of Institution Type on log-odds of withdrawal
$\delta_{010}$ = average effect of OER across all institutions
$\delta_{011}$ = cross-level interaction between Institution Type and OER Implemented
$\delta_{100}$ = average effect of CLC across all institutions
$\delta_{101}$ = cross-level interaction between Institution Type and CLC
$\delta_{110}$ = average effect of the interaction between OER Implemented and CLC across all institutions
$\delta_{111}$ = three-way interaction between Institution Type, OER Implemented, and CLC
$u_{0jk}$ = random error in log-odds of withdrawal for course *j* at institution *k*
$v_{00k}$ = random error in log-odds of withdrawal for institution *k*

Following sample size guidelines for multilevel models estimating binary outcomes (McNeish & Stapleton, 2016), we removed student records from any courses with fewer than 50 students. This resulted in a final main sample size of 696,270 student records.

**Course Grades.** We examined course grades by first calculating the percentage of each grade category (A, B, C, D, F) based on OER implementation (i.e., no OER implemented versus OER implemented). In addition to the raw percentage differences, we also conducted two-proportion statistical significance testing and computed Cohen's *h* effect size for the difference in each grade category across OER implementation.

### *RQ2: Are there differences in time to degree completion depending on OER exposure?*

We conducted ordinary least squares (OLS) regression analysis to examine differences in students' time to degree completion (continuous outcomes) depending on OER exposure.

### *RQ3: To what extent do implementation conditions and experiences differ by level of OER implementation?*

Given the qualitative nature of the information gathered through the instructor survey, we used descriptive methods (comparison of percentages) to examine differences in the implementation conditions and experiences reported by instructors by the level of OER implemented in the course (i.e., adoption of an OER textbook versus the instructor revising, remixing, and/or creating OER).

### *RQ4: How has the implementation of OER in one course enabled different teaching and learning practices for the instructor?*

We used descriptive methods (comparison of percentages) to examine differences in the teaching and learning practices that were enabled post-OER implementation, as reported by instructors, by the level of OER implementation (adoption of on OER textbook versus the instructor revising, remixing, and/or creating OER).

## Focus Groups

The purpose of the focus group interviews was to identify key OER implementation strategies and teaching practice changes in order to construct a comprehensive instructor survey to be distributed widely to instructors in the historical dataset. We conducted semi-structured focus group interviews via Zoom between October 2024 and January 2025. Each group included three to four participating interviewees alongside three researchers. Each of the participants was provided with a $400 honorarium for participating.

To identify interview participants, we requested that each institutional liaison submit contact information for three instructors whom they considered to be "OER rockstars" at their institutions—in other words, individuals who were early adopters of OER, stood out as particularly invested and creative OER implementers, contributed to department or institutional OER initiatives, and/or served as mentors to other OER adopters. Our objective was to interview at least one individual meeting our definition of an "OER rockstar" per institution.

We developed a semi-structured focus group interview protocol following guidelines provided by Krueger and Casey (2015). Interview questions focused on several main topics: (a) the participants' first experience implementing OER in their own classrooms, (b) what good vs. poor OER implementation might look like, (c) how students were involved in their OER implementation, and (d) how their teaching practices evolved when adopting OER.

## Focus Group Questioning Protocol

The objective of these focus groups is to better understand and define OER implementation quality. By *implementation*, we are referring to an instructor's adoption, revision, creation, or use of any type of Open Educational Resources (OER) and/or Open Educational Practice (OEP) in their course(s).

1. Tell us your name, the institution you work for, and in what courses you have implemented open educational resources (OER).
2. We would like you to think back to the first time you implemented OER in one of your courses. What was that experience like?
3. What do you think are some key characteristics of a high quality OER implementation?
4. What characteristics would make you question the quality of OER implementation?
5. In what ways were students, graduate or undergraduate, involved in the process of implementing OER, if at all?

## Focus Group Questioning Protocol (Continued)

6. Has adopting OER led you to think differently about teaching? If so, in what ways?
7. Tell us about any changes you've made in your course design or teaching practices that were influenced by your implementation of OER.
8. If you could go back, what would you have changed about your OER implementation journey?
9. Our goal is to develop a framework of high-quality OER implementation process. With this framework, we hope to examine factors that influence student outcomes in OER courses and provide a guide for people new to OER. Is there anything about high-quality OER implementation that hasn't been mentioned yet?

We used Zoom to video and audio record each interview. The transcripts automatically provided by Zoom were then carefully reviewed and corrected, as needed, to reflect verbatim transcription of the interviews. To code the interview data, two researchers first developed a list of codes using thematic whole text analysis (Glaser & Strauss, 1967). The same two researchers then independently coded the interviews in NVivo 15 with acceptable inter-rater reliability. When there was a difference in coding between researchers, each discrepancy was discussed before a final code was assigned.

### Instructor Survey

We used the themes and codes developed from the focus group interviews to inform the Instructor Survey, which we distributed to instructors represented in our quantitative dataset. We designed the survey to be course-specific: instructors who taught multiple courses in the dataset received the survey multiple times and were asked to respond based on their experiences with each specific course. Questions focused on (a) previous OER experience, (b) reasons for implementing OER, (c) institutional support received during implementation (e.g., payment, professional development, mentorship), and (d) teaching practices at the time of OER implementation.

We built and distributed the survey in Qualtrics using individual, course-specific hyperlinks, and provided the hyperlinks and template invitation emails to campus liaisons, who then merged them with faculty contact information and distributed the survey locally. This approach helped ensure deliverability and that the sender was a familiar campus contact, while maintaining instructor anonymity from AAC&U staff.

We distributed surveys largely in September 2025, with two campuses distributing in December 2025 and January 2026 due to campus-based delays. Liaisons sent an initial invitation email followed by at least one weekly reminder until the survey closed. We incentivized respondents through a raffle offering either a complimentary registration to AAC&U's 2026 Conference of Learning and Student Success or one of ten $50 Amazon gift cards. To conduct the drawing, we collected optional email addresses and immediately disaggregated identifying information from survey responses.

## Instructor Survey Protocol

The purpose of this Instructor Survey is to gather information about your experience implementing OER. By *implementation*, we are referring to your adoption, revision, creation, or use of any type of Open Educational Resources (OER) and/or Open Educational Practice (OEP) in your course(s).

**Overall Experience:**

1. Please enter the **course name** listed in the recruitment email you used to access this survey: (short answer)
2. Have you already completed this survey for a different course? [display logic for questions at the end]

## **Instructor Survey Protocol** (Continued)

Please answer the following questions based on your experience in OER implementation in **ONLY THE COURSE YOU LISTED ABOVE**

3. Had you implemented OER in any other course prior to your implementation of OER in this specific course? Yes/no (display logic: next question)

4. In about how many other courses did you implement OER **prior** to this course?
    - (Options: Number range, dropdown)

5. In what year did you first implement OER in **any** course that you have taught?
    - Short response

### OER Implementation in This Course

6. Think back to when you first implemented OER in this course, which of the following applied:
    - You chose to implement OER based on your personal motivation.
        - (display logic if chosen) What motivated you to implement OER in this course? (long response)
    - You collaborated with a team to implement OER in this course (e.g., Co-authored the OER, was part of a faculty committee to standardize an OER textbook for use in the course, etc.)
        - (display logic if chosen) What were the motivations for implementing OER in this course? (long response)
    - You were required to use the OER textbook as part of a standardized course but had little or no input into the decision.
    - You were required to find and implement an OER on your own as part of a larger departmental or institutional initiative.
    - Other (please explain): (short response)

7. Please indicate all of the following that apply to the implementation of OER in this course:
    - You adopted an OER textbook that required little to no modification for implementation in this course
    - You revised or remixed an OER textbook for use in this course
    - You authored or co-authored a textbook from scratch for use in this course
    - The OER implemented in the course was authored by students (i.e., open pedagogy).

8. About how much did the textbook cost that you replaced with an OER in this course? (short response, $$)

9. Are there any supplementary resource costs to the students in this course in addition to the free, OER textbook?
    - Homework system
    - Calculator
    - Software (SPSS, ArcGIs, etc.)
    - Lab supplies/fees
    - Administrative/Course fees
    - Additional course resources behind paywalls
    - None
    - Other (please describe):

10. (Display logic if any answer except “None” above:) Did you make any special considerations about those supplementary materials when implementing OER in this course? (short response)

11. How would you rate the students’ ease of access to the OER in this course?
    - Likert scale (*easy* to *challenging*)

12. How were students involved in the **implementation** of OER in this course, if at all? This would be student involvement beyond utilizing the OER in the course as a learner.
    - Students provided feedback about the OER formally or informally
    - Student government or formal student group(s) played a role in implementation
    - Students created or co-created content for the OER
    - Other (please describe):
    - Students were not involved in the OER implementation

## **Instructor Survey Protocol** (Continued)

13. Did you receive training/professional development (PD) to guide your implementation or use of OER in this course at the time of implementation? (Yes/No) [display logic]
    - If so, about when did you receive the training/PD?
        - (Options: More than 1 year prior; previous academic year; same academic year)
    - If so, please select all applicable descriptions of the type and duration of the training/PD.
        - Single session workshop/training
        - Multiple session workshop/training
        - Formal training course or institute (e.g., certificate program, AAC&U Institute on Open Education)
        - Learning community/fellowship
        - Mentorship/consultation
        - College course
        - Other: please explain (short response)
    - If so, please select all applicable descriptions of the type and duration of the training/PD.
        - Single session workshop/training
        - Multiple session workshop/training
        - Formal training course or institute (e.g., certificate program, AAC&U Institute on Open Education)
        - Learning community/fellowship
        - Mentorship/consultation
        - College course
        - Other: please explain (short response)
    - Who provided the training/PD? (select all that apply)
        - Center for Teaching and Learning or equivalent
        - Library
        - Department- or Institution-based program (mentorship/consultations)
        - Informal mentorship/consultations
        - State- or national-level initiative or association
        - Other (please explain): (short response)
    - Who funded the training/PD? (select all that apply)
        - Department/unit PD funds
        - Institutional PD funds
        - Personal funds
        - Internal grant
        - External grant
        - Programming was provided by the institution (unknown funding source)
        - No-cost programming
        - Other (please explain): (short response)

14. Did you receive any form of financial incentive to implement OER at the time of implementation? (Yes/No)
    - If so, how much? (Short response)
    - If so, from whom?
        - Department/unit
        - Institution (e.g., Provost, Internal grant/honorarium)
        - External grant/honorarium
        - Other (please explain): (short response)

15. What types of time support, if any, did you receive for OER implementation at the time of implementation?
    - Course release
    - Summer stipend
    - Reduced teaching load
    - Dedicated prep time
    - None
    - Other (please explain): (short response)

16. To what extent do you agree with the following?
    - "I had adequate time allocated to properly implement OER in this course."
        - Likert scale (*strongly disagree* to *strongly agree* scale)

17. How did the time investment for implementing OER in this course compare to your initial expectations?
    - Likert scale (*significantly more time* to *significantly less time*)

## **Instructor Survey Protocol** (Continued)

18. How much additional time would you estimate OER implementation required compared to using traditional textbooks in this course?
    - Likert scale (*significantly more* to *significantly less*)

19. Which of the following provided support and/or resources at your institution to guide you through your OER implementation in this course, if any? (Select all that apply.)
    - Librarians
    - Center for Teaching and Learning staff
    - Instructional designers
    - Mentor
    - Learning community
    - No additional support provided
    - Other (please describe): (short response)

20. What other incentives were provided by your department/unit or institution in relation to implementing OER in this course, if any? (Select all that apply)
    - Counts towards tenure and promotion/performance evaluation as **teaching**
    - Counts towards tenure and promotion/performance evaluation as **service**
    - Counts towards tenure and promotion/performance evaluation as **scholarship**
    - Award/formal recognition
    - Other (please describe):

21. How supported did you feel by the various stakeholders below when first implementing OER in this course?

| *Fully supported* | *Mostly supported* | *Somewhat supported* | *Somewhat unsupported* | *Largely unsupported* | *Not supported at all* |
|---|---|---|---|---|---|

    Stakeholders:
    - Upper administration
    - Department/unit
    - Direct supervisor
    - Colleagues
    - Support staff
    - Students
    - The broader campus community

22. How would you rate the quality of your initial implementation of OER in this course? (Note: we are not looking for the quality of the OER itself, but of your *implementation process*.)
    - Excellent implementation
    - Very good implementation
    - Good implementation
    - Fair implementation
    - Poor implementation
    - Very poor implementation

23. How would you rate the quality of your implementation of OER in this course over time? (Note: we are not looking for the quality of the OER itself, but of your *implementation process*.)
    - Excellent implementation
    - Very good implementation
    - Good implementation
    - Fair implementation
    - Poor implementation
    - Very poor implementation
    - I have just recently implemented and feel no change in the implementation quality

24. If you could go back, what would you have done differently when first implementing OER in this course, if anything? (long response)

## **Instructor Survey Protocol** (Continued)

25. In what ways, if any, did implementing or using OER facilitate a change, however small, in your teaching approaches in this course over time?
    - Helping to decenter the textbook in the course
    - Increasing focus on active learning strategies or shift in the role/technique of the instructor in the course (e.g., flipped classroom, lecture vs. discussions)
    - Increasing your use of backward design
    - Individualizing course content for the specific course/population of students/geographic area, etc.
    - Increasing student engagement with the textbook/OER
    - Making the textbook more visible and accessible to students
    - Ensuring teaching materials and resources are accessible to all students
    - Incorporating and utilizing Universal Design for Learning (UDL) practices in the classroom.
    - Increasing transparency in the course (e.g., transparent wayfinding, scaffolding assessments/projects, transparency in student success measures
    - Increased student autonomy
    - Other (please describe): (long response)

**The following questions focus on <u>any</u> course or course section that you have taught after first implementing OER. You will only see these questions in the first survey that you complete.**

26. Have you pursued or been offered additional OER-specific professional development opportunities since your initial implementation of OER in any course? (yes/no)

27. In what ways, if any, has your classroom instruction in any course changed as a result of implementing or using OER? (long response)

28. What additional changes, if any, have you made to your teaching practices in any course to level the playing field for all students after implementing OER? (e.g., Universal design for learning) (long response)

29. In what ways, if any, was the pandemic a driver for your implementation or use of OER? (long response)

30. What policies, if any, did you put into place in this course due to/during the pandemic? (e.g., grading, withdrawal, student choice on course modality, enrollment rates)

**Final Question:**

31. Is there anything that this survey didn't capture about your OER implementation experience that you would like to share? (long response)

# Appendix B: Results Tables

**Table B1:** Significance Tests of Parameter Estimates for Course Withdrawal Final Three-Level Hierarchical Model

| Parameter | $\chi^2$ | *df* | *p* |
|---|---|---|---|
| (Intercept) | 615.957 | 1 | <.001 |
| OER implemented (no vs. yes) | 99.357 | 1 | <.001 |
| Institution type | 148.806 | 5 | <.001 |
| Composite learner complexity (CLC) | 184.912 | 1 | <.001 |
| OER implemented X institution type | 82.439 | 5 | <.001 |
| OER implemented X CLC | 11.266 | 1 | <.001 |
| Institution type X CLC | 1,304.901 | 5 | <.001 |
| OER implemented X institution type X CLC | 15.905 | 5 | .007 |

**Table B2:** Parameter Estimates for Predicted Course Withdrawal Rates From Final Three-Level Model

| Parameter | Estimate | S.E. | *Z* | *p* |
|---|---|---|---|---|
| Intercept | -2.524 | 0.102 | -24.818 | <.001 |
| OER implemented | -0.250 | 0.025 | -9.968 | <.001 |
| Doctoral universities | -1.763 | 0.168 | -10.473 | <.001 |
| HBCUs | -0.924 | 0.315 | -2.933 | .003 |
| Private 4-year institutions | -2.674 | 0.433 | -6.172 | <.001 |
| Regional public 4-year institutions | -0.984 | 0.447 | -2.202 | .028 |
| Tribal colleges | 1.102 | 0.725 | 1.521 | .128 |
| Composite learner complexity (CLC) | 0.106 | 0.008 | 13.598 | <.001 |
| OER implemented X doctoral universities | -0.304 | 0.054 | -5.592 | <.001 |
| OER implemented X HBCUs | 0.317 | 0.103 | 3.087 | .002 |
| OER implemented X private 4-year institutions | -0.118 | 0.530 | -0.223 | .824 |
| OER implemented X regional public 4-year institutions | 0.476 | 0.086 | 5.527 | <.001 |
| OER implemented X tribal colleges | -0.348 | 0.862 | -0.403 | .687 |
| OER implemented X CLC | 0.037 | 0.011 | 3.357 | .001 |
| Doctoral universities X CLC | 0.701 | 0.020 | 35.559 | <.001 |
| HBCUs X CLC | 0.091 | 0.038 | 2.408 | .016 |
| Private 4-year institutions X CLC | 0.464 | 0.159 | 2.918 | .004 |
| Regional public 4-year institutions X CLC | 0.246 | 0.025 | 9.718 | <.001 |
| Tribal colleges X CLC | -0.276 | 0.173 | -1.600 | .110 |
| OER implemented X doctoral universities X CLC | -0.018 | 0.032 | -0.573 | .566 |
| OER implemented X HBCUs X CLC | -0.071 | 0.052 | -1.366 | .172 |
| OER implemented X private 4-year institutions X CLC | 0.062 | 0.253 | 0.243 | .808 |
| OER implemented X regional public 4-year institutions X CLC | -0.138 | 0.036 | -3.807 | <.001 |
| OER implemented X tribal colleges X CLC | 0.059 | 0.333 | 0.176 | .860 |

*Note.* OER not implemented and community colleges were coded 0.

**Table B3:** Significance Tests of Parameter Estimates for Course Withdrawal Final Model (Level of OER Implementation)

| Parameter | $\chi^2$ | *df* | *p* |
|---|---|---|---|
| Intercept | 118.141 | 1 | <.001 |
| Level of OER implemented | 21.514 | 2 | <.001 |
| Institution type | 23.560 | 3 | <.001 |
| Composite learner complexity (CLC) | 21.053 | 1 | <.001 |
| Level of OER implemented X institution type | 26.186 | 6 | <.001 |
| Level of OER implemented X CLC | 8.140 | 2 | .017 |
| Institution type X CLC | 238.411 | 3 | <.001 |
| Level of OER implemented X institution type X CLC | 14.422 | 6 | .025 |

**Table B4:** Parameter Estimates for Predicted Course Withdrawal Rates (Level of OER Implementation

| Parameter | Estimate | S.E. | *Z* | *p* |
|---|---|---|---|---|
| Intercept | -2.591 | 0.238 | -10.869 | <.001 |
| OER implementation adopt | -0.073 | 0.078 | -0.938 | .348 |
| OER implementation revise/remix/create | -0.408 | 0.088 | -4.631 | <.001 |
| Doctoral universities | -1.773 | 0.407 | -4.354 | <.001 |
| HBCUs | -1.193 | 0.466 | -2.559 | .011 |
| Regional public 4-year institutions | -1.291 | 0.382 | -3.377 | .001 |
| Composite learner complexity (CLC) | 0.093 | 0.020 | 4.588 | <.001 |
| OER implementation adopt X doctoral universities | -0.968 | 0.292 | -3.308 | .001 |
| OER implementation revise/remix/create X doctoral universities | -0.075 | 0.142 | -0.528 | .598 |
| OER implementation adopt X HBCUs | -0.326 | 0.466 | -0.701 | .484 |
| OER implementation revise/remix/create X HBCUs | 0.631 | 0.440 | 1.432 | .152 |
| OER implementation adopt X regional public 4-year institutions | 0.589 | 0.207 | 2.840 | .005 |
| OER implementation revise/remix/create X regional public 4-year institutions | 0.498 | 0.241 | 2.070 | .038 |
| OER implementation adopt X CLC | 0.027 | 0.034 | 0.817 | .414 |
| OER implementation revise/remix/create X CLC | 0.107 | 0.037 | 2.852 | .004 |
| Doctoral universities X CLC | 0.652 | 0.044 | 14.855 | <.001 |
| HBCUs X CLC | 0.273 | 0.110 | 2.482 | .013 |
| Regional public 4-year institutions X CLC | 0.345 | 0.051 | 6.748 | <.001 |
| OER implementation adopt X doctoral universities X CLC | 0.126 | 0.146 | 0.860 | .390 |
| OER implementation revise/remix/create X doctoral universities X CLC | 0.042 | 0.082 | 0.509 | .611 |
| OER implementation adopt X HBCUs X CLC | 0.054 | 0.219 | 0.246 | .806 |
| OER implementation revise/remix/create X HBCUs X CLC | -0.289 | 0.207 | -1.398 | .162 |
| OER implementation adopt X regional public 4-year institutions X CLC | -0.241 | 0.085 | -2.855 | .004 |
| OER implementation revise/remix/create X regional public 4-year institutions X CLC | -0.219 | 0.096 | -2.270 | .023 |

*Note.* OER not implemented and community colleges were coded 0.

## **Table B5:** Change in Percentages of Final Course Grades From Pre- to Post-OER Implementation

| Course grade | Pre-OER | | Post-OER | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | *n* | % | *n* | % | % difference | $\chi^2$ | *df* | *p* | Cohen's *h* |
| A | 117,973 | 37.815 | 140,727 | 42.674 | 4.859 | 1,572.900 | 1 | <.001 | 0.099 |
| B | 82,139 | 26.329 | 77,477 | 23.494 | -2.835 | 689.230 | 1 | <.001 | -0.066 |
| C | 49,505 | 15.868 | 44,957 | 13.633 | -2.235 | 638.080 | 1 | <.001 | -0.063 |
| D | 19,570 | 6.273 | 16,589 | 5.030 | -1.243 | 465.250 | 1 | <.001 | -0.054 |
| F | 42,789 | 13.715 | 50,024 | 15.169 | 1.454 | 273.740 | 1 | <.001 | 0.041 |
| **Total** | **311,976** | | **329,774** | | | | | | |

## **Table B6:** Change in Percentages of Final Course Grades From Pre- to Post-OER Implementation by Institution Type

| Course grade | Institution type | Pre-OER | | Post-OER | | % difference | $\chi^2$ | *df* | *p* | Cohen's *h* |
|---|---|---|---|---|---|---|---|---|---|---|
| | | *n* | % | *n* | % | | | | | |
| A | Community colleges | 78,593 | 40.382 | 92,974 | 43.888 | 3.506 | 510.880 | 1 | <.001 | 0.071 |
| | Doctoral universities | 12,853 | 32.902 | 18,769 | 43.446 | 10.544 | 963.410 | 1 | <.001 | 0.218 |
| | HBCUs | 10,021 | 29.183 | 13,052 | 33.742 | 4.559 | 174.740 | 1 | <.001 | 0.098 |
| | Private 4-year institutions | 1,429 | 42.266 | 751 | 48.452 | 6.186 | 16.239 | 1 | <.001 | 0.124 |
| | Public 4-year institutions | 14,966 | 37.178 | 15,097 | 44.022 | 6.844 | 360.200 | 1 | <.001 | 0.139 |
| | Tribal colleges | 111 | 35.463 | 84 | 41.584 | 6.121 | 1.704 | 1 | .192 | 0.126 |
| B | Community colleges | 46,959 | 24.128 | 45,842 | 21.639 | -2.489 | 356.470 | 1 | <.001 | -0.059 |
| | Doctoral universities | 12,345 | 31.601 | 12,813 | 29.659 | -1.942 | 36.358 | 1 | <.001 | -0.042 |
| | HBCUs | 10,219 | 29.759 | 9,397 | 24.293 | -5.466 | 276.370 | 1 | <.001 | -0.123 |
| | Private 4-year institutions | 1,113 | 32.919 | 468 | 30.194 | -2.726 | 3.501 | 1 | .061 | -0.059 |
| | Public 4-year institutions | 11,420 | 28.369 | 8,892 | 25.929 | -2.440 | 55.513 | 1 | <.001 | -0.055 |
| | Tribal colleges | 83 | 26.518 | 65 | 32.178 | 5.661 | 1.654 | 1 | .198 | 0.124 |
| C | Community colleges | 26,493 | 13.612 | 25,369 | 11.975 | -1.637 | 244.110 | 1 | <.001 | -0.049 |
| | Doctoral universities | 8,642 | 22.122 | 7,880 | 18.240 | -3.882 | 192.350 | 1 | <.001 | -0.097 |
| | HBCUs | 6,928 | 20.175 | 6,617 | 17.106 | -3.069 | 113.210 | 1 | <.001 | -0.079 |
| | Private 4-year institutions | 576 | 17.036 | 174 | 11.226 | -5.811 | 27.375 | 1 | <.001 | -0.168 |
| | Public 4-year institutions | 6,806 | 16.907 | 4,883 | 14.239 | -2.669 | 99.542 | 1 | <.001 | -0.074 |
| | Tribal colleges | 60 | 19.169 | 34 | 16.832 | -2.338 | 0.307 | 1 | .580 | -0.061 |
| D | Community colleges | 11,073 | 5.689 | 9,886 | 4.667 | -1.023 | 216.790 | 1 | <.001 | -0.046 |
| | Doctoral universities | 3,521 | 9.013 | 2,578 | 5.967 | -3.046 | 276.800 | 1 | <.001 | -0.116 |
| | HBCUs | 2,359 | 6.870 | 2,429 | 6.279 | -0.590 | 10.250 | 1 | .001 | -0.024 |
| | Private 4-year institutions | 121 | 3.579 | 59 | 3.806 | 0.228 | 0.099 | 1 | 0.754 | 0.012 |
| | Public 4-year institutions | 2,479 | 6.158 | 1,634 | 4.765 | -1.394 | 68.722 | 1 | <.001 | -0.061 |
| | Tribal colleges | 17 | 5.431 | 3 | 1.485 | -3.946 | 4.119 | 1 | .042 | -0.226 |
| F | Community colleges | 31,505 | 16.188 | 37,774 | 17.831 | 1.643 | 193.600 | 1 | <.001 | 0.044 |
| | Doctoral universities | 1,704 | 4.362 | 1,161 | 2.687 | -1.675 | 170.640 | 1 | <.001 | -0.091 |
| | HBCUs | 4,812 | 14.013 | 7,187 | 18.580 | 4.566 | 275.900 | 1 | <.001 | 0.124 |
| | Private 4-year institutions | 142 | 4.200 | 98 | 6.323 | 2.123 | 9.888 | 1 | .002 | 0.096 |
| | Public 4-year institutions | 4,584 | 11.387 | 3,788 | 11.046 | -0.342 | 2.135 | 1 | .144 | -0.011 |
| | Tribal colleges | 42 | 13.419 | 16 | 7.921 | -5.498 | 3.183 | 1 | .074 | -0.179 |

## **Table B7:** Change in Percentages of Final Course Grades From Pre- to Post-OER Implementation by Composite Learner Complexity

| Course grade | CLC | Pre-OER | | Post-OER | | % difference | $\chi^2$ | *df* | *p* | Cohen's *h* |
|---|---|---|---|---|---|---|---|---|---|---|
| | | *n* | % | *n* | % | | | | | |
| A | 0 | 17,441 | 41.714 | 21,612 | 49.346 | 7.632 | 501.920 | 1 | <.001 | 0.153 |
| | 1 | 28,939 | 38.364 | 34,767 | 43.975 | 5.611 | 501.320 | 1 | <.001 | 0.114 |
| | 2 | 37,081 | 36.195 | 43,912 | 40.394 | 4.199 | 393.220 | 1 | <.001 | 0.086 |
| | 3 | 34,512 | 37.398 | 40,436 | 41.174 | 3.776 | 284.130 | 1 | <.001 | 0.077 |
| B | 0 | 12,333 | 29.497 | 11,425 | 26.086 | -3.411 | 123.940 | 1 | <.001 | -0.076 |
| | 1 | 20,333 | 26.955 | 19,197 | 24.282 | -2.674 | 144.810 | 1 | <.001 | -0.061 |
| | 2 | 26,656 | 26.019 | 25,281 | 23.256 | -2.763 | 216.980 | 1 | <.001 | -0.064 |
| | 3 | 22,817 | 24.725 | 21,574 | 21.968 | -2.757 | 202.200 | 1 | <.001 | -0.065 |
| C | 0 | 6,599 | 15.783 | 5,759 | 13.149 | -2.634 | 119.900 | 1 | <.001 | -0.075 |
| | 1 | 12,437 | 16.488 | 10,831 | 13.700 | -2.788 | 234.330 | 1 | <.001 | -0.078 |
| | 2 | 17,003 | 16.597 | 15,715 | 14.456 | -2.141 | 184.400 | 1 | <.001 | -0.059 |
| | 3 | 13,466 | 14.592 | 12,652 | 12.883 | -1.709 | 117.310 | 1 | <.001 | -0.050 |
| D | 0 | 2,294 | 5.487 | 1,729 | 3.948 | -1.539 | 112.760 | 1 | <.001 | -0.073 |
| | 1 | 4,724 | 6.263 | 3,830 | 4.844 | -1.418 | 148.160 | 1 | <.001 | -0.062 |
| | 2 | 6,727 | 6.566 | 5,971 | 5.493 | -1.074 | 107.360 | 1 | <.001 | -0.045 |
| | 3 | 5,825 | 6.312 | 5,059 | 5.151 | -1.161 | 118.770 | 1 | <.001 | -0.050 |
| F | 0 | 3,144 | 7.520 | 3,272 | 7.471 | -0.049 | 0.066 | 1 | .797 | -0.002 |
| | 1 | 8,999 | 11.930 | 10,435 | 13.199 | 1.269 | 56.402 | 1 | <.001 | 0.038 |
| | 2 | 14,982 | 14.624 | 17,830 | 16.402 | 1.778 | 126.870 | 1 | <.001 | 0.049 |
| | 3 | 15,664 | 16.974 | 18,487 | 18.824 | 1.851 | 110.620 | 1 | <.001 | 0.048 |

## **Table B8:** Significance Tests of Parameter Estimates for Time to Completion Model

| Parameter | *df* | *F* | *p* |
|---|---|---|---|
| Intercept | 1 | 59,592.800 | <.001 |
| OER courses (0 vs at least 1) | 1 | 251.070 | <.001 |
| Composite learner complexity (CLC) | 1 | 102.628 | <.001 |
| Institution type | 4 | 252.678 | <.001 |
| OER courses X CLC | 1 | 6.246 | .012 |
| OER courses X institution type | 4 | 20.554 | <.001 |
| CLC X institution type | 4 | 28.564 | <.001 |
| OER courses X CLC X institution type | 4 | 1.957 | .098 |

## **Table B9:** Parameter Estimates for Time to Completion Model

| Parameter | Estimate | S.E. | *Z* | *p* |
|---|---|---|---|---|
| Intercept | 72.784 | 0.298 | 244.116 | <.001 |
| At least one OER course | -6.742 | 0.426 | -15.845 | <.001 |
| Doctoral universities | -12.107 | 0.427 | -28.377 | <.001 |
| HBCUs | -14.311 | 0.910 | -15.719 | <.001 |
| Private 4-year institutions | -17.646 | 1.771 | -9.966 | <.001 |
| Regional public 4-year institutions | -10.867 | 0.544 | -19.989 | <.001 |
| Composite learner complexity (CLC) | 1.401 | 0.138 | 10.131 | <.001 |
| At least one OER course X doctoral universities | 5.009 | 0.678 | 7.393 | <.001 |
| At least one OER course X HBCUs | 8.695 | 1.491 | 5.833 | <.001 |
| At least one OER course X private 4-year institutions | 7.318 | 3.502 | 2.089 | .037 |
| At least one OER course X regional public 4-year institutions | 4.258 | 0.935 | 4.551 | <.001 |
| At least one OER course X CLC | 0.486 | 0.194 | 2.499 | .012 |
| CLC X doctoral universities | -0.912 | 0.280 | -3.252 | .001 |
| CLC X HBCUs | -1.374 | 0.479 | -2.868 | .004 |
| CLC X private 4-year institutions | 1.684 | 0.873 | 1.930 | .054 |
| CLC X regional public 4-year institutions | 2.016 | 0.249 | 8.109 | <.001 |
| At least one OER course X CLC X doctoral universities | -0.961 | 0.452 | -2.127 | .033 |
| At least one OER course X CLC X HBCUs | -1.501 | 0.767 | -1.956 | .050 |
| At least one OER course X CLC X private 4-year institutions | -1.262 | 1.873 | -0.674 | .500 |
| At least one OER course X CLC X regional public 4-year institutions | -0.262 | 0.423 | -0.619 | .536 |

*Note.* No OER courses and community colleges were coded 0.

## **Table B10:** Parameter Estimates for Time to Degree Completion for Community Colleges

| Parameter | *b* | *SE* | *df* | F | *p* |
|---|---|---|---|---|---|
| Intercept | 71.535 | 0.296 | 1 | 58,550.916 | <.001 |
| Number of OER courses | -1.845 | 0.158 | 1 | 136.004 | <.001 |
| Composite learner complexity (CLC) | 1.611 | 0.136 | 1 | 140.170 | <.001 |
| Number of OER courses X CLC | -0.031 | 0.072 | 1 | 0.188 | .665 |