Teaching and Learning with Open Educational Resources (OER)

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Achieving
the Dream™

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Acknowledgments

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Letter from Achieving the Dream President and CEO, Dr. Karen A. Stout

Six years ago, Achieving the Dream, a network of more than 300 institutions focused on transforming our nation's community colleges into equitable, student-centered organizations, introduced the Open Educational Resources (OER) Degree Initiative. Funded by the William and Flora Hewlett Foundation, the effort was designed to help accelerate the use of OER on 38 community college campuses in 13 states and study key aspects of implementation to determine how to make Open Education Resources a vehicle for increased course and degree completion, cost reduction, and improved teaching.

An [evaluation of that initial work](#) by SRI Education noted that the initiative "provided encouraging evidence regarding the academic outcomes of students who enrolled in multiple OER courses, the economic impacts for both students and institutions, and the experiences of key stakeholders." In addition to these important findings, many faculty also shared that they had begun to use innovative teaching practices in their OER classes. This led ATD and SRI to pursue this follow-up study to find out whether the use of OER leads to instructional transformation, how the use of OER shapes pedagogy and how the use of open content enables more equitable, culturally responsive teaching practices.

This new report by SRI Education, *Teaching and Learning with Open Educational Resources*, begins that work. Based on interviews with faculty and administrators, student focus groups, and course observations at eight community colleges, it is a careful examination of teaching practice among the most committed OER users and technology-oriented faculty members. It examines the extent to which these faculty members are addressing key domains of OER-based, student-centered, and culturally relevant teaching where OER has great promise to advance new approaches to teaching.

This study reveals that community college faculty are just beginning to build the foundations to take advantage of the full range of open and culturally relevant practice that make the adoption of OER a promising pathway to more equitable teaching and student outcomes. We see evidence that adoption of these materials and practices has the potential to give students more sense of agency and ownership over their learning. Inclusive content

increased students' sense of belonging and connection to course materials. And, by creating collaborative, safe, and open classrooms, students' level of comfort increased as did their engagement in the course.

The study is important because it provides a framework from which institutions and instructors can review practice and support faculty members in their work to make their classrooms more engaging, their teaching more culturally relevant and their outcomes more significant. We know in our learning at ATD that frameworks are important in advancing transformation at scale, inside our colleges, and across our field. The framework identifies five interconnected dimensions of open and culturally relevant practice that can help institutions assess the impact of these practices on course design, instructional materials, classroom instructional practices, assessments and assignments, and interactions with students.

Improving instruction has too often been on the margins of our institutional efforts to improve student outcomes. OER can be a powerful lever for ensuring that teaching and learning tools are relevant and encourage students to be more engaged in learning to gain the momentum they need to persist and reach their goals. This is particularly important as colleges seek to transform teaching in ways that will lead to more equitable outcomes for racially minoritized and poverty impacted students.

Achieving the Dream is grateful to the William & Flora Hewlett Foundation for funding support, to our research partner, SRI Education, and to the eight community colleges that participated in this effort. We hope that community college leaders and faculty will embrace and take advantage of these findings. As always, ATD is ready to support these efforts as we incorporate these findings into our services for colleges.

Sincerely,

Karen A. Stout

President & CEO
Achieving the Dream, Inc.

Executive Summary

The open education movement is rooted in the desire to break down barriers to education and to democratize opportunities for access and participation in the creation of knowledge, especially for historically marginalized populations. Much of the early momentum and research on open education focused on the benefits of using freely available and openly licensed instructional materials, or open educational resources (OER), in place of proprietary materials.[1,2,3,4] However, open education proponents increasingly argue that the greatest potential of OER is in its potential for catalyzing more student-centered, equity-focused instructional practices that elevate students' knowledge and cultures and give students greater agency over their learning – sometimes referred to as "open pedagogy," or more broadly, "open educational practices" (OEP).[5,6,7,8]

While a growing body of literature documents the benefits of converting courses to use entirely OER materials, little empirical research is available that examines whether the use of OER is leading to instructional transformation, what OEP look like in the classroom, and how the use of these practices affects students. Further, there is an urgent need for greater insight into how the use of OER can support educational equity, particularly in educational settings that serve diverse student populations. This report presents findings from a qualitative study exploring how a set of leading practitioners are using the affordances of OER to enact open and culturally responsive instruction in community colleges.

Research Design

For this study of teaching and learning with OER, the research team sought to develop a **framework of open and culturally responsive educational (CRE) practices** grounded in both theory and the perspectives and experiences of practitioners in community colleges.[9] We then recruited a purposive sample of community

1   Colvard, N. B., Watson, C. E., & Park, H. (2018). The impact of open educational resources on various student success metrics. *International Journal of Teaching and Learning in Higher Education, 30*(2), 262–276.

2   Deimann, M., & Farrow, R. (2013). Rethinking OER and their use: Open education as Bildung. *The International Review of Research in Open and Distributed Learning, 14*(3), 344. https://doi.org/10.19173/irrodl.v14i3.1370

3   Schaffert, S. (2010). Strategic integration of open educational resources in higher education. In U.-D. Ehlers & D. Schneckenberg (Eds.), *Changing Cultures in Higher Education* (pp. 119–131). Springer. https://doi.org/10.1007/978-3-642-03582-1_11

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

5   Ehlers, U.-D. (2011). From open educational resources to open educational practices. *E-Learning Papers*, 23, 1–8.

6   Colvard et al. (2018). *Impact of open educational resources*, 262–276.

7   Andrade, A., Caine, A., Carneiro, R., Ehlers, U.-D., Holmberg, C., Kairamo, A.-K., Koskinen, T., Kretschmer, T., Moe-Pryce, N., Mundin, P., Nozes, J., Reinardt, R., Richter, T., Silva, G. (2011). *Beyond OER: Shifting focus to open educational practices* (OPAL Report 2011). Retrieved from: https://www.researchgate.net/publication/259597164_Beyond_OER_-_Shifting_Focus_to_Open_Educational_Practices_OPAL_Report_2011

8   Funk, J. (2019). *Open for whom? Open educational practice with Indigenous workforce development and learners* [Doctoral Dissertation]. Charles Darwin University. https://ris.cdu.edu.au/ws/portalfiles/portal/33375830/Thesis_CDU_33364393_Funk_J.pdf

9   Scholarship in this area has evolved considerably to include terminology such as culturally responsive pedagogy and culturally relevant teaching. We use the term "culturally responsive education" in this study as it encompasses a larger range of practices centering students' experiences, identities, and learning goals. In our examination of the literature, we draw from scholarship representative of the broader field.

colleges and instructors that were highly engaged in course redesign with OER and committed to the use of innovating teaching and learning practices. We conducted virtual site visits to these eight colleges during the spring and summer of 2021.

At each institution, we interviewed instructors, administrators, and students, and conducted course observations, completing a total of 64 interviews and 21 observations. Interview and observation data were coded and analyzed for themes and patterns in how OER-enabled OEP and culturally responsive education practices were conceptualized and implemented by community college instructors, experienced by students, and supported by institutions.

The COVID-19 pandemic presented several unique challenges regarding data collection as well as the fact that instructors and students alike experienced significant changes in their teaching and learning experiences with the shift to hybrid or fully online instruction. In response to health and safety protocols, all site visits were conducted virtually.

Framework for Enacting Open and Culturally Responsive Practices

The SRI research team developed a framework to capture how OEP and culturally responsive education practices may be enacted across the components of a course, including course design, instructional materials, classroom teaching practices, assessments and assignments, and interactions. The framework defines five dimensions associated with open and culturally responsive education—student

agency and ownership, inclusive content, collaborative knowledge generation, critical consciousness, and classroom culture. Across the dimensions, practices emphasize increased student agency and voice, centering students as co-creators or collaborators in instruction and knowledge development, and greater incorporation of inclusive and relevant content. This framework evolved over the study: early versions guided the development of protocols and collection of data, which informed continued iteration of the framework. The final product may be a useful tool for instructors and institutions considering infusing open and culturally responsive practices into their courses.

Course Transformation with OER in Practice

Through site visit interviews and course observations, the research team documented ways in which a hand-picked group of instructors who have embraced OER were enacting each dimension of the framework in their courses.

- **Increasing student voice and choice in assignments:** Instructors gave students some opportunities to assert voice and choice, typically in selecting topics for assignments or in offering suggestions for course materials. Numerous instructors reported giving students choice in selecting how they would show their learning.

- **Increasing inclusivity through relevant content:** The flexibility of OER enabled instructors to incorporate topics that are relevant to students' lives and tailor the course features to meet students' needs

and backgrounds. Additionally, OER allowed instructors to bring in a more diverse set of perspectives by including authors from backgrounds not represented in traditional textbooks.

- **Creating opportunities for knowledge creation and collaboration:** Some instructors provided opportunities for students to share their ideas with each other, offered opportunities for students to generate or apply new knowledge, and/or asked students to help select course materials or to create OER material. Several instructors also created assignments in which students applied course concepts to real-world scenarios or social/community problems. However, fewer instructors described themselves as learning alongside students as part of these collaborations.

- **Striving to increase students' critical consciousness:** Instructors sometimes attempted to develop students' critical consciousness and engage in social justice issues. In some courses, instructors addressed social justice issues through readings, discussions, or examples. More often, instructors used course assignments to address social justice issues and/ or aimed to develop or grow students' critical consciousness around current events and issues.

- **Building safer and inclusive classroom culture:** Most instructors described efforts to build inclusive and caring classroom cultures, though they did not explicitly connect these practices with equity in most cases. While classroom culture was difficult to assess in an online setting,

interviews and observations suggest that instructors made concerted efforts to build positive, safer, and welcoming classroom cultures even when they were gathering online.

How These Practices Affected Students

Student reflections were mostly consistent with instructors' descriptions of their practices, especially with respect to classroom culture. Given the challenges of recruiting student participants in remote courses during COVID, we should consider the possibility that the students who chose to participate were relatively engaged and enthusiastic about their courses.

- **More choice gave students a sense of agency:** Most students reported feeling that the added flexibility in courses gave them agency and ownership over their learning, which some said contributed to greater motivation or success in these courses. A few students felt they had limited agency over course design and content.

- **Inclusive content increased students' sense of belonging and connection to the material:** A few students reported that what they learned in their OER courses felt relevant and applicable to the real world, making them feel more connected to and represented in the course.

- **Fostering positive interactions built a safer classroom culture:** Students experienced a collaborative, safer, and open classroom culture which increased

their level of comfort and engagement in the course. Students described how instructors created this open culture by fostering positive relationships between and with students. However, not all students felt there were regular interactions between students or with instructors, most often because of asynchronous learning due to COVID-19.

Institutional Facilitators and Barriers for OEP

In general, institutional supports focused on the adoption of OER materials rather than open and culturally responsive instructional practices. A few colleges did integrate support for these practices in other resources provided for instructional improvement and online teaching or offer specific OEP supports.

- **Institutional policies and administrative leadership:** Institutional leaders in this study played a significant role in propelling OER adoption at their college by prioritizing OER initiatives and incorporating them into their strategic plans. Notably, these institutional policies typically did not address the use of OER-enabled OEP.

- **Financial resources:** College faculty members identified financial supports for OER adoption, but in general, they did not name sources dedicated explicitly to expanding or improving the adoption of teaching practices consistent with OEP.

- **Trainings and fellowships:** Most institutions offered optional training sessions on OER, and some facilitated

trainings on OEP. Any trainings on OEP were typically infused into other types of professional development such as online teaching, pedagogy, or online learning platforms.

- **Additional supports:** Most institutions had created organizational infrastructure to support open educational initiatives more broadly. Typically, infrastructure supported the adoption of OER materials, such as OER coordinators or online OER repositories. Some institutions offered supports for faculty to learn about and implement OEP, including online platforms, centers for teaching and learning, and conferences.

- **Support for culturally responsive pedagogy:** Administrators identified equity as a focus of their OER initiatives, though most associated equity with access and cost savings as opposed to changes in instructional practices.

- **Barriers to OER expansion and OEP implementation:** Participants cited a number of barriers to implementing OER and OEP, including lack of administrative support and funding, lack of flexibility in course learning goals, and lack of alignment with tenure requirements.

Discussion

Evidence from virtual site visits suggests that innovative and advanced OER users are using more student-centered and equity-focused practices in their courses. For some instructors, the process of converting their courses to OER opened their thinking to open pedagogies, while for others, OER was

a helpful tool for the more student-centered pedagogies they had already adopted.

Even within this group of relatively advanced OER users, we observed a mix of innovative and traditional instructional approaches. A substantial share of instructors described seeking ways to incorporate students' voices and interests into their courses and to provide opportunities for integrating real-world issues into course assignments. In many cases observed by researchers, however, instructors made relatively modest changes to their teaching practices in redesigned courses by allowing more limited forms of student voice and choice. In general, when they described their goals for students and course priorities, instructors tended to emphasize students' sense of belonging and engagement more than their critical thinking and reasoning. Those who expressed the most concern with developing students' content knowledge and analytic skills tended to use more traditional methods of instruction and assessment.

Instructors and administrators had varying approaches to equity: most saw the freely accessible feature of OER as the primary means of advancing equity, followed by inclusive content. Some also sought to incorporate social justice issues into their course content and assignments, especially in courses such as anthropology and sociology whose content and learning objectives aligned well with issues of social justice and equity. In observations and interviews, relatively few instructors explicitly integrated critical consciousness into their courses or discussed strategies to equitize power among students or between students and themselves.

These colleges' policies and practices were, for the most part, supportive of OER adoption but placed less emphasis on instructional transformation. Some administrators appeared to encourage instructional innovation in general but felt constrained in promoting specific ways of teaching. Efforts to promote instructional innovation sometimes included practices that could be considered open, such as increasing student voice and inclusivity, but not necessarily using an open education framing.

Given that this sample of instructors was carefully selected to demonstrate the leading edge of instructional transformation, it seems likely that the adoption of OEP is nascent within community colleges more generally. At the same time, our understanding and interpretation of these findings must account for the disruption caused by the pandemic and the difficulty of conducting – and observing – student-centered and collaborative practices in online modalities.

Future research of in-person courses would deepen our understanding of the full range of open and culturally responsive educational practices associated with OER use. In addition, an intentional approach to implementing a well-defined set of such practices would enable researchers to analyze how these practices impact students' experiences, learning, and course outcomes.

I. Introduction

Background

Since its inception, the open education movement has been animated by a desire to break down barriers to education and to democratize opportunities for access and participation in the creation of knowledge, especially for historically marginalized populations. Much of the early momentum and research on open education has focused on the benefits of using freely available and openly licensed instructional materials, or open educational resources (OER), in place of proprietary materials.[10,11,12,13] The use of OER offers clear benefits for students in the form of cost savings and having access to instructional materials from day one of a course. However, open education proponents increasingly argue that the greatest potential of OER is in the opportunity it presents to broaden instructors' philosophies about teaching and catalyze innovative instructional strategies. Reimagined courses can enact more student-centered, equity-focused approaches that elevate students' knowledge and cultures and give students greater agency over their learning. These approaches are sometimes referred to as "open pedagogy," or more broadly "open educational practices" (OEP).[14,15,16,17]

Researchers have defined open education practices in a variety of ways, but two prevalent themes are that these practices should empower students to direct their own learning and center them as co-creators of knowledge.[18,19,20,21,22,23] Additionally, researchers and practitioners are concerned

10 Colvard et al. (2018). *The impact of open educational resources on various student success metric*s, 262–276.

11 Deimann, M., & Farrow, R. (2013). Rethinking OER and their use: Open education as Bildung. *The International Review of Research in Open and Distributed Learning, 14*(3), 344. https://doi.org/10.19173/irrodl.v14i3.1370

12 Schaffert, S. (2010). Strategic integration of open educational resources in higher education. In U.-D. Ehlers & D. Schneckenberg (Eds.), *Changing Cultures in Higher Education* (pp. 119–131). https://doi.org/10.1007/978-3-642-03582-1_11

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

14 Ehlers. (2011). *From open educational resources to open educational practices*, 1–8.

15 Colvard et al. (2018). *Impact of open educational resources on various student success metrics*, 262–276.

16 Andrade et al. (2011). *Beyond OER: Shifting focus to open educational practices.*

17 Funk. (2019). *Open for whom? Open educational practice with Indigenous workforce development and learners*

18 DeRosa, R., & Jhangiani, R. (2017). Open Pedagogy. In Elizabeth Mays (Ed.), *A Guide to Making Open Textbooks with Students*. http://openpedagogy.org/open-pedagogy/

19 Ehlers. (2011). *From open educational resources to open educational practices*, 1–8.

20 Murphy, A. (2013). Open educational practices in higher education: Institutional adoption and challenges. *Distance Education, 34*(2), 201–217. https://doi.org/10.1080/01587919.2013.793641

21 Paskevicius, M. (2017). Conceptualizing open educational practices through the lens of constructive alignment. *Open Praxis, 9*(2), 125. https://doi.org/10.5944/openpraxis.9.2.519

22 Geser, G. (Ed.). (2007). Open educational practices and resources: OLCOS roadmap 2012. *Open e-Learning Content Observatory Services* (OLCOS), 1–150. https://files.eric.ed.gov/fulltext/ED498433.pdf

23 Beetham, H., Falconer, I., McGill, L., & Littlejohn, A. (2012). *Open practices: Briefing paper*. JISC. https://oersynth.pbworks.com/w/file/fetch/58444186/Open%20Practices%20 briefing%20paper.pdf

with educational equity and the ways in which OEP can support students from historically marginalized or underserved backgrounds.[24,25]

Even as theoretical foundations for OEP have progressed, research to date has not yet demonstrated whether the adoption of OER is actually leading to these kinds of instructional transformations in practice.[26] Moreover, little is known about how the adoption of these practices affects students' experiences and outcomes. Most empirical research on OER has focused on how students fare in courses that use OER compared to those that do not, often without examining other types of changes in how courses were taught.[27,28] The study described in this report sought to conduct more in-depth research on these connections, particularly in educational environments that serve students with diverse cultural backgrounds and life experiences.

The Open Educational Resources (OER) Degree Initiative led by Achieving the Dream (ATD) from 2016–18 provided an unusual opportunity to scale up the development and delivery of courses that use entirely freely accessible and openly licensed materials.[29]

Nearly 2,000 instructors at 38 colleges were involved in redesigning courses using OER materials that enrolled nearly 160,000 students over 3 years. In SRI's evaluation of the initiative, researchers found evidence of both academic gains and cost-saving benefits for students.[30] In surveys, most instructors reported at least moderately changing their pedagogical practice with the use of OER, with over one-third reporting a moderate or significant change.[31] Specifically, instructors reported they gave students a more active role in their learning, increased the relevance of instructional materials, and changed how they presented materials in class.[32] The study results, however, provided limited insight into

What are Open Educational Resources (OER)?

OER materials are teaching and learning resources that have an open intellectual property license that permits their free use and repurposing. OER can include everything from full courses, course materials, or modules, to textbooks, videos, tests, and assignments. Instructors may adapt, adopt, curate, or create OER materials to support the redesign of a course.

24 Ehlers. (2011). *From open educational resources to open educational practices*, 1–8.

25 Lambert, S. R. (2018). Changing our (dis) course: A distinctive social justice aligned definition of open education. *Journal of Learning for Development, 5*(3), 225–244.

26 O'Neill N. (2021). *Examining the use of open educational resources among faculty in departments with multiple OER course conversions: Implications for practice*. [Doctoral dissertation]. University of Pennsylvania.

27 Colvard et al. (2018). *Impact of open educational resources*, 262–276.

28 Wiley, D., Williams, L., DeMarte, D., & Hilton, J. (2016). The Tidewater Z-Degree and the INTRO model for sustaining OER adoption. *Education Policy Analysis Archives, 24*, 41. https://doi.org/10.14507/epaa.24.1828

29 Achieving the Dream. (2020). *Open Educational Resources (OER) Degree Initiative*. https://www.achievingthedream.org/resources/initiatives/open-educational-resources-oer-degree-initiative

30 Griffiths, R., Mislevy, J. & Wang, S. Encouraging impacts of an Open Education Resource Degree Initiative on college students' progress to degree. *High Educ* (2022). https://doi.org/10.1007/s10734-022-00817-9

31 Griffiths, R., Mislevy, J., Wang, S., Ball, A., Shear, L., Desrochers, D. (2020). *OER at Scale: The Academic and Economic Outcomes of Achieving the Dream's OER Degree Initiative*. Menlo Park, CA: SRI International

32 Griffiths et al. (2020). *OER at scale.*

what was actually happening within classrooms or how these changes were connected with improved student outcomes and experiences.

From the student perspective, meanwhile, most of the benefits of OER courses appeared to stem from cost savings and online access to course materials, though some students reported that they appreciated that instructional materials were closely aligned to what they were expected to learn and were easy to access. It was unclear to what extent students experienced other changes in course design or delivery, let alone what impact those changes might have had on their academic success.

The Teaching and Learning with OER study described in this paper thus originated to advance our understanding of two phenomena: one, how the adoption of OER in community colleges leads to changes in course design and delivery broadly defined as "open educational practices" (OEP), and two, how these changes affect students. The present study aimed to identify, document, and analyze innovations in teaching and learning practices among a sample of highly innovative

> **What are Open Educational Practices (OEP)?**
>
> We define OEP as instructional practices that use the affordances of OER to empower learners as co-producers of knowledge and to value and incorporate diverse learners' backgrounds, needs, and voices in their learning.

instructors and courses that use OER, as well as to explore how institutional conditions can support such innovations.

Incorporation of Culturally Responsive and Equity-Focused Teaching Frameworks

The current movement to address longstanding issues of systemic and structural racism in the United States is prompting special consideration of how the use of OER impacts underserved students and enables equity-focused instructional practices. Prior empirical research on this topic is especially limited. The OER Degree Initiative study found that students of color reported greater benefits from OER cost savings, but for the most part, impacts on students' academic outcomes did not vary by race and ethnicity. Most other OER studies do not report differences by student race and ethnicity.

To shed light on these questions, the research team turned to culturally responsive education literature to inform our understanding of equity-focused instructional practices. Culturally responsive education (CRE) is an evolving philosophy and set of frameworks that seek to embed students' cultures deeply into the processes and structures of learning and view the classroom as a site for social change.[33,34] The research team explored intersections between the principles and practices of CRE with those of OEP, which seemed to be a

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33 Aronson, B., & Laughter, J. (2016, March). The theory and practice of culturally relevant education: A synthesis of research across content areas. *Review of Education Research, 86*(1), 163–206. https://www.doi.org/10.3102/0034654315582066

34 Johnston, E., D'Andrea Montalbano, P., & Kirkland, D.E. (2017). *Culturally responsive education: A primer for policy and practice.* Metropolitan Center for Research on Equity and the Transformation of Schools, New York University. https://steinhardt.nyu.edu/metrocenter/culturally-responsive-education-primer-policy-and-practice

natural progression given that both CRE and the open education movement are rooted in values of education equity and social justice.[35] Scholars and practitioners in both fields argue that educators should:

- Elevate different cultural perspectives in classroom structures and discourse.
- Create educational experiences that empower and engage students from diverse backgrounds.[36,37,38]
- Develop students' sense of agency as drivers of their learning journeys.[39,40,41,42]
- Apply disciplinary skills and knowledge to real-world problems in students' own communities.

The Teaching and Learning with OER study examined ways in which using OER enabled or prompted faculty to make their courses and teaching practices more open and culturally responsive. The study focused specifically on instruction in community colleges, which enroll students from diverse cultural backgrounds and with varied life experiences. In theory, OER can enable more open and equity-focused practices by offering instructors greater latitude in developing and modifying their course materials. What does this look like in practice?

About this Report

This report begins with a description of the study design, including the research questions we sought to answer, and the data collection activities conducted during each part of this two-phase study. The report then describes the development of a Framework for Enacting Open and Culturally Responsive Practices, drawing from both theory and practitioner perspectives. Next, we present findings on the implementation of these practices from both an instructor and student perspective, followed by an exploration of the ways in which institutions do (or do not) support instructional transformation with OER. The report concludes with a discussion of the significance of the study's findings for the open education movement and avenues for future inquiry.

35 Aronson & Laughter. (2016). *The theory and practice of culturally relevant education*, 163–206.

36 Lambert. (2018). *Changing our (dis)course*, 239.

37 Ehlers. (2011). *From open educational resources to open educational practices*, 1–8.

38 Bali, M., Cronin, C., & Jhangiani, R. (2020). Framing open educational practices from a social justice perspective. *Journal of Interactive Media in Education, 1*(10), 1–12. https://doi.org/10.5334/jime.565

39 Gay, G. (2002). Preparing for culturally responsive teaching. *Journal of Teacher Education, 53*(2), 106–116.

40 Ladson-Billings, G. (1995). But that's just good teaching! The case for culturally relevant pedagogy. *Theory into Practice, 34*(3), 159–165.

41 Brown, M., & Croft, B. (2020). Social annotation and an inclusive praxis for open pedagogy in the college classroom. *Journal of Interactive Media in Education, 1*(8), 1–8. https://doi.org/10.5334/jime.561

42 DeRosa, R., & Jhangiani, R. (2017). Open Pedagogy.

II. Research Design

The primary goal of this study was to explore the ways in which the use of OER leads to the adoption of more open and culturally responsive instructional practices and how these changes affect students, especially those from historically marginalized and underserved backgrounds. We opted to employ descriptive and exploratory methods given the broad variation in ways in which practitioners conceptualize and enact these practices.

This study sought to answer the following research questions:

1. How do community college faculty and staff conceptualize OEP, and to what extent does this conceptualization emphasize the use of OER and culturally responsive practices?

2. How did a selected group of innovative instructors use OER materials to redesign their courses using open and culturally responsive practices? What types of teaching practices were observed in these courses?

3. How did the use of OEP enabled by OER affect students' perceptions of their learning, sense of belonging, agency, and engagement?

4. What college institutional policies and practices support or impede implementation of OER-enabled OEP and culturally responsive practices?

The study took place in two phases from fall 2020 through fall 2021 and involved 64 participants at eight community colleges representing a range of geographical locations in the United States. Here we provide an overview of the research methods, and additional detail is provided in Appendix A.

Phase One: Developing an OEP/CRE Framework

In the first phase of the study, we sought to develop a conceptual foundation for our operationalization of OEP and culturally responsive education through reviewing literature and interviewing expert scholars and practitioners. The purpose of interviewing practitioners, particularly in community colleges, was to ground our framework to examine open and culturally responsive courses in the vocabulary and perspectives of people's lived experiences.

Based on these sources, we developed a framework for examining the use of open educational and equity-focused instructional practices within college courses. The framework maps out key dimensions of OEP and CRE across the major course components: course design, instructional materials, teaching practices, assessments and assignments, and interactions. The development of the framework provided a mechanism for synthesizing our understanding of OEP and CRE dimensions as they apply in community college contexts and to guide interview and course observation protocols. The framework is not intended to be comprehensive and excludes some considerations (such as parental/guardian involvement) that some CRE experts see as critical for K-12 students.[43]

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43 Powell, R., Cantrell, S. C., Correll, P. K., & Malo-Juvera, V. (2017). *Culturally responsive instruction observation protocol* (4th ed.). University of Kentucky College of Education.

Phase Two: Conducting Site Visits

The second phase of the study took place from winter through summer 2021 and consisted of recruiting and conducting virtual site visits to eight colleges. As indicated in Exhibit 1, an important criterion for selecting these colleges was that respondents demonstrate institutional support for and adoption of both OER and OEP. We aimed to recruit institutions with clusters of OEP pioneers rather than individual practitioners.

Exhibit 1: Selection Criteria for Participation in Teaching and Learning with OER Study

1. The scale and maturity of the institution's OER program (based on the number of instructors and courses that incorporate OER materials).
2. Evidence of multiple practitioners transforming instruction using OER and/or involvement with collaborative efforts to implement OEP and/or CRE using OER.
3. The institution's commitment to the OER program (e.g., if there is a designated OER liaison, if resources are available for OER course conversion, etc.).
4. If the OER program offers support for instructional transformation.
5. Institutional characteristics and/or student demographics, to attain geographical and demographic representation in the full sample.
6. Academic disciplines participating in OER and OEP initiatives, to attain representation of various academic disciplines (particularly STEM vs. non-STEM subject areas).
7. Instructional modality, to attain a balance of virtual versus in-person and synchronous versus asynchronous instruction.

The SRI research team conducted virtual site visits at each selected college during the spring and summer of 2021. For each site visit, we aimed to conduct interviews with 3–5 instructors, 1–2 administrators and staff with involvement in the OER program, 1–2 focus groups with 3–5 students each, and course observations for a subset of instructors interviewed. In some cases, these targets were relaxed due to recruitment challenges, particularly in the case of students. As a result, nearly all the focus groups were individual interviews.

In addition to conducting interviews with faculty and student focus groups, we completed 21 course observations during the spring and summer site visits. For courses that were delivered online (the vast majority), researchers gained access to course websites through the institutions' learning management systems and thus were thus able to view the syllabus, slide decks, assignments and assessments, and discussion board posts associated with each course. The overall course observation helped us to gain additional insights into the extent to which instructors implemented instructional practices aligned with our understanding of OEP and CRE.

Exhibit 2 shows the participants at each site. SRI worked with each site to identify a coordinator who assisted in identifying faculty members and instructors for these interviews.

Exhibit 2: Site Visit Interviews and Observations

Site	Administrators	Instructors	Student Focus Groups		Classroom Observations	
-	-	-	# SFGs	# Students	Synchronous	Asynchronous
A	3	4	2	2	3	0
B	0	2	2	2	1	0
C	2	4	1	1	0	1
D	3	5	1	1	1	4
E	2	5	0	0	1	2
F	3	5	1	1	0	1
G	2	4	2	5	4	0
H	3	3	2	2	2	1
Total	18	32	11	14	21	

Note: Exhibit shows the number of interviews, student focus groups, and classroom observations conducted at each of the eight sites in the study. We display the number of student focus groups as well as the number of students interviewed since the number of students varied across student focus groups. Due to the COVID-19 pandemic, several classroom observations were conducted asynchronously. Asynchronous observations included reviewing the course online learning management system, syllabus, and assignments.

Analysis

The research team conducted interviews via Zoom that were recorded and transcribed (with the exception of one instructor interview, for which we did not have permission to record). Researchers developed a coding framework inductively and deductively, covering the following set of topics:

- Instructor and administrator understanding of and goals around OER, OEP, and CRE, including how these concepts are intertwined.

- Classroom practices, including course features like materials and assignments/assessments, as well as aspects of culturally responsive education and OEP.

- Institutional context, such as institutional goals and networks of support for OER and OEP.

- Student experiences in classes that use OER, OEP, and CRE, including students' perceptions of these classes and how engaged they are.

The research team coded transcripts, analyzed data within each set of codes, identified emergent themes, and assessed indicators of range and variation. In service of the study goals, we also identified instances of exemplar practices.

Limitations

The COVID-19 pandemic created some unique challenges in implementing our original research design, particularly related to data collection activities. In accordance with health and safety recommendations, all spring site visits were conducted virtually, and the vast majority of courses were delivered in a remote learning environment. This transition prevented us from observing the full range of instructional practices. When courses were taught asynchronously, it was not possible to observe instructional practices that teachers typically used during live classes. Even when they met in person, practitioners were forced to abandon typical instructional practices to prioritize student safety. For example, while a math course continued to take place in person, the instructor could not ask students to work in small groups during class as they typically would have because students needed to stay six feet apart from one another. Other features of virtual instruction made it difficult to identify examples of OEP and CRE in synchronous courses, such as assessing students' levels of engagement during a Zoom class when their cameras were turned off. Additionally, we received a low response rate from students to invitations to participate in focus groups. Instructors hypothesized that students were less engaged in virtual courses in general, and thus less likely to volunteer to participate in research.

We attempted to mitigate these impacts by collecting supplemental forms of data in class observations through learning management systems. We also raised the gift card incentive from $25 to $40 in hopes of attracting more students and continued site visit activities during the summer term. We acknowledge the limitations of these data in our interpretation of findings and suggest that future research is needed to gain a deeper understanding of OEP and CRE in face-to-face settings.

III. Developing a Framework for Enacting Open and Culturally Responsive Practices

This section presents a Framework for Enacting Open and Culturally Responsive Practices, which both informed and emerged from the data collection and analysis for this study. A first iteration of the framework was developed from literature and an initial phase of interviews in fall 2020 and winter 2021. The framework continued to evolve throughout spring and summer 2022 data collection and analysis.

The framework presented in Exhibit 3 identifies five **dimensions** associated with open education and culturally responsive education:

1. **Study agency and ownership**, or the extent to which the course integrates student voice and positions students as leaders of their learning.

2. **Inclusive content**, or how the instructor brings in diverse perspectives and tailors the content to students' backgrounds.

3. **Collaborative knowledge generation**, or how students apply/develop new theories or contribute to "renewable" (i.e., can be published or used for something else in the future) or generative assignments.

4. **Critical consciousness**, or how the instructor aims to develop students' critical consciousness by providing them with real-world assignments, decolonizing the curriculum, and addressing power imbalances.

5. **Classroom culture**, or how the instructor cultivates strong relationships and an inclusive environment by creating safer spaces, following ethics of care, and generating respect among students and between the students and the instructor.

As will become evident, these dimensions have interconnections, thus the conceptualization of one dimension (e.g., student agency) will often overlap with others (e.g., knowledge generation). Still, teasing out distinctions between these concepts proved useful in fleshing out how they could be operationalized across key features of a course, which include:

1. **Course design**, including the course vision, planning, structure, and grading policies.

2. **Instructional materials**, such as textbooks, slide decks, and lab manuals.

3. **Classroom teaching practices**, including questioning strategies, how the class period is structured, and/or how the instructor uses class time.

4. **Assessments and assignments**, including homework assignments, in-class activities, and examinations/quizzes.

5. **Interactions**, or how the students interact with each other and with the instructor both online and in-person.

Exhibit 3: Framework for Enacting Open and Culturally Responsive Practices[44]

			Dimension of Open Educational & Culturally Responsive Practices				
			Student agency & ownership	Inclusive content	Collaborative knowledge generation	Critical consciousness	Classroom culture
			Course allows for student agency or ownership (e.g., student has voice, choice, or leadership over learning)	Course contains inclusive content (e.g., brings in diverse perspectives, tailors to students' backgrounds, needs or interests)	Course allows opportunities for students to apply, evaluate, or create new knowledge	Course aims to develop students' critical consciousness and/or emancipation	Course has strong culture or relationships (e.g., safer space, ethic of care, respect among students and instructor, inclusive environment)
Course Features	Course design	Course feature related to course design (e.g., course vision, planning, structure, grading policies)	Students have a say in course design, e.g., co-creating syllabus, input on grading practices	Course design creates opportunities for the expression and development of diverse perspectives	Course design includes collaborative and generative learning activities	Course includes learning experiences in which students investigate and take action on real-world problems	Instructor plans course activities to build collaborative, welcoming, and open class culture
	Instructional materials	Course feature related to course materials (e.g., texts, PPTs, and other materials)	Students choose, edit, or create instructional materials	Course materials include topics that are relatable to the students and their communities	Students have opportunities to contribute to or create lesson materials	Instructor incorporates a diversity of authors to bring in multiple perspectives	Class materials reflect students' needs, backgrounds, or interests to create an inclusive and safer learning experience
	Teaching practices	Course feature related to instructional practices (e.g., questioning strategies, lesson structure, how instructors use class time)	Instructor uses instructional strategies that invite student voice, choice, and leadership	Instructor tailors class topics to include culturally referenced prior knowledge and student interests	Instructor learns with and from students	Instructor reflects on own positionality, power, and potential for bias.	Instructor demonstrates an ethic of care and maintains a safer and respectful environment
	Assignments & Assessments	Course feature related to course assignments and assessments (e.g., homework, assignments, class activities, assessments)	Instructor gives students choice over how they demonstrate their learning	Assignments involve application of course concepts to real-world topics	Students contribute to the creation of assignments that are used again in future classes	Instructors design assessments that account for culture and context	Students experience satisfaction & joy sharing their knowledge and skills
	Interactions	Course feature related to interpersonal interactions (e.g., how instructors and students interact) both online and in person.	Instructor facilitates discussions and allows students to drive the conversation	Students and instructor demonstrate an understanding of, respect for, and interest in each other's backgrounds and perspectives	Instructor and students are learning together through respectful discourse and collaboration	Instructor encourages students to pursue multiple perspectives and question dominant narratives	Instructor creates a safer space and sense of community

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44 This framework draws from various educational literature and practitioner-centered resources that discuss the use of OER to enable open-educational practices (OEP), including the Culturally Responsive Instruction Observation Protocol (CRIOP) (Powell & Rightmyer, 2011) and Teaching for Robust Understanding (TRU) (Schoenfeld et al., 2016) among others, as well as frameworks and literature on OEP and culturally responsive education (e.g., DeRosa & Jhangiani, 2017; Andrade et al., 2011; Nascimbeni & Burgos, 2016; Nascimbeni, Burgos, Campbell, & Tabacco, 2018; Lambert, 2018; Bali et al., 2020). Please see Appendix A for details on the development of the framework.

Dimensions of the Framework

This section explains each dimension of the framework and discusses the theoretical foundation and primary source data collected from interviews with experts and practitioners related to open and culturally responsive instructional practices. Where appropriate, we adapted theoretical constructs to reflect the ways in which practitioners operating in community colleges conceptualized open and culturally responsive practices.

Increase Student Ownership Over Learning

While learner empowerment is an important, but non-essential, criterion for using OER, it is a critical component of OEP.[45,46] Classrooms with a high degree of "openness" support students in identifying learning methods and objectives, thereby enabling them to chart their own learning journey.[47] They involve students in "active, constructive engagement with content, tools, and services in the learning process," thereby increasing students' capacity for "self-management, creativity and working in teams."[48]

Study participants articulated these principles in similar terms, expressing that they value activities and practices that increase student agency over their own learning. Some instructors felt that increasing student ownership over course content both increases student engagement and improves the quality of the course over time. An instructor expanded on this by highlighting how "empowering students to be content creators, knowledge creators, to teach one another, and to leave something behind" lead to greater equity in the classroom, noting that the student-led knowledge and lessons produced in their course are as valuable as what they may encounter from external sources.

Increase Course Relevancy and Inclusivity

Both open pedagogy and culturally responsive education promote inclusivity by bridging course concepts with students' personal experiences and backgrounds. Since students understand and engage with new academic skills and concepts to a greater extent if they reflect their "lived experiences and frames of references," culturally responsive teaching practices use "the cultural characteristics, experiences, and perspectives of ethnically diverse students as conduits for teaching them more effectively."[49]

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45 Brown & Croft. (2020). *Social annotation and an inclusive praxis for open pedagogy*, 1-8.

46 DeRosa, R., & Jhangiani, R. (2017). Open Pedagogy.

47 Andrade et al. (2011). *Beyond OER: Shifting focus to open educational practices*, 1–191.

48 Geser. (2007). *Open educational practices and resources*, 37.

49 Gay. (2002). *Preparing for culturally responsive teaching*, 106.

Interview participants comparably described how the use of OER can allow practitioners to select, modify, or create course content that reflects their students' backgrounds and interests. While textbooks present a fixed body of knowledge, using OER materials requires educators to "dream beyond" a textbook and consider what topics are best for their students and the knowledge they want students to acquire. Administrators posited that bringing in relevant content can both enhance students' educational experiences and persistence as well as encourage faculty to learn more about their students' cultures and backgrounds.

Collaborate and Create New Knowledge

The potential of OER to help students develop competencies that will enable them to successfully navigate the 21st century workplace, such as working and communicating effectively with others, may be limited if the "prevailing practice of teacher-centered knowledge transfer remains intact."[50] In an open education environment, students work with one another and alongside their instructor to generate and share new knowledge, while educators exchange ideas and best practices with their colleagues.[51,52] Participants described how instructors can help to create such a collaborative classroom culture by re-positioning themselves as facilitators of student learning as

opposed to lecturers. Practitioners explained that they believe such an approach calls for educators to work alongside their students to identify course goals and content, as well as consistently creating opportunities for students to share and work with one another.

OEP commits to centering students in the "knowledge-creation process," by positioning them in a role that has "traditionally been reserved for those with advanced degrees."[53] OEP emphasizes the overall process of creating course content and increasing access to education as students and instructors collaborate to produce and re-use OER materials.[54,55] In doing so, open pedagogy facilitates "learner-driven education," thereby enabling students to "shape the public knowledge commons of which they are a part."[56] Practitioners conceptualize this dimension as facilitating opportunities for students to generate new knowledge in forms such as instructional resources and course assessments. They see this practice as a way to impress upon students that traditional, instructional materials, like publisher textbooks, should be seen as "a" source of knowledge in open education courses, as opposed to "the" source, and that students themselves bring valuable knowledge and experience.

50 Geser. (2007). *Open educational practices and resources*, 16.

51 Cronin, C. (2017). Openness and praxis: Exploring the use of open educational practices in higher education. *International Review of Research in Open and Distributed Learning, 18*(5), 15–34. https://doi.org/10.19173/irrodl.v18i5.3096

52 Cape Town Open Education Declaration. (2007). https://www.capetowndeclaration.org/

53 Brown & Croft. (2020). *Social annotation and an inclusive praxis for open pedagogy*, 8.

54 Beetham, H., Falconer, I., McGill, L., & Littlejohn, A. (2012). *Open practices: Briefing paper*. https://eprints.gla.ac.uk/186419/1/186419.pdf

55 Andrade et al. (2011). *Beyond OER: Shifting focus to open educational practices.*

56 DeRosa, R., & Jhangiani, R. (2017). Open Pedagogy.

Improve Critical Consciousness

Open education can support a more socially just learning environment in a number of ways, including by producing "learning materials and experiences primarily by and for the benefit and empowerment of non-privileged learners who may be underrepresented in education systems or marginalized in their global context."[57] While OEP focuses on the role of students in producing knowledge, culturally responsive practices emphasize building students' sociopolitical consciousness and embracing social justice and activist stances to empower diverse student populations.[58,59] OEP activities too can advance social justice when they are used to develop socially conscious citizens who seek to empower others and when they elevate the interests of historically marginalized populations.[60] In interviews, OER experts and practitioners emphasized that simply changing instructional materials or inviting students to contribute to them does not necessarily create a more inclusive or relevant learning environment. Two scholarly experts described how students from diverse backgrounds can resist White/Western-dominated instructional environments by incorporating their perspectives and experiences into open materials. Open and culturally responsive teaching can help students realize the importance of

these contributions by supporting their development as activists.

Create a Safer and Respectful Classroom Culture

Brown-Jeffy and Cooper's framework of culturally responsive pedagogy (CRP) groups CRP principles under five different themes, including student-teacher relationships.[61] Teachers who practice CRP "accept that the community is a vital partner in students' learning," and they work with their students to "build classroom community, making it a safer place in which to nurture everyone's cultural identity."[62] Practitioners and scholarly experts we spoke with discussed building a classroom community that encourages student-student and student-teacher interactions as a critical part of strong OEP implementation. Establishing trust between students and their teacher is an essential element, as students will feel more comfortable sharing their ideas and less afraid of making mistakes. Instructors also highlighted the importance of creating an inclusive classroom culture that acknowledges students' unique identities and experiences.

Next, we will present data from interviews and observations about how the dimensions of the framework looked in practice.

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57 Lambert. (2018). *Changing our (dis) course*, 239.

58 Ladson-Billings. (1995). *But that's just good teaching!*, 159–165.

59 Ladson-Billings, G. (1992). Reading between the lines and beyond the pages: A culturally relevant approach to literacy teaching. *Theory and Practice*, 31, 312–320.

60 Bali et al. (2020). *Framing open educational practices from a social justice perspective*, 1–12.

61 Brown-Jeffy, S., & Cooper, J. (2011). Toward a conceptual framework of culturally relevant pedagogy: An overview of the conceptual and theoretical literature. *Teacher Education Quarterly*, 78, 65–84.

62 Brown-Jeffy & Cooper. (2011). *Toward a conceptual framework of culturally relevant pedagogy*, 65–84.

IV. Course Transformation with OER in Practice

How did a selected group of innovative instructors use affordances of OER to redesign their courses using open and culturally responsive practices? What types of teaching practices were observed in these courses?

In interviews, instructors described a wide range of ways in which they transformed aspects of their courses through the use of OER, though some aspects changed more than others. Some instructors adopted these student-centered and inclusive practices independently from their use of OER, though some instructors' use of OEP may have been prompted or inspired by instructors' redesigning their courses to use OER materials. When converting to OER, instructors reported the most changes to instructional materials and assignments and assessments and relatively fewer deep changes to course design, classroom practices, and interactions. Overall, about half of the participating instructors said that using OER enabled OEP practices such as tailoring content to student needs and interests, incorporating more opportunities to include student voice or interests into the class, and increasing student involvement in creating course content. Some instructors used OER to enable activities that were more relevant to their students and involved their students in creating renewable resources and materials. Use of OER in the service of promoting critical consciousness was less common, aside from courses that naturally addressed issues of race and inequality in their subject matter, such as sociology and anthropology. Instructors also made less use of the kinds of teaching practices that are often used to create inclusive, empowering classroom cultures such as group projects, perhaps in part due to online modalities necessitated by COVID-19.

Instructors tended to report more use of OEP than was demonstrated by evidence from course observations. Many of these courses involved traditional instructor-led lectures or discussions and limited student engagement. Again, these findings may reflect the difficulty instructors faced in transitioning to virtual instruction during the pandemic. Still, this finding seems significant given the purposive nature of this sample, suggesting that adoption of OEP in community colleges is still nascent.

In addition to the description of our findings below, we gathered examples of exemplary assignments or practices that align with multiple components, as shown in Exhibit 4. These examples were assessed by how well each assignment or practice aligns with each dimension of the framework.

Increasing Student Voice and Choice in Assignments

Instructors gave students some opportunities to assert voice and choice, typically in selecting topics for assignments or in offering suggestions for course materials. Numerous instructors reported giving students choice over how they would show their learning.

Most often, instructors described giving students some agency in selecting readings or topics for assignments. These instances afforded students a limited form of control, for example, selecting which country they wished to examine for an economics project in which other parameters of the assignment were fixed. Several instructors also described providing students options for how they demonstrate learning, such as creating a project or writing an exam. One instructor permitted a student to submit a poem in place of a more traditional assignment.

Even when instructors explicitly connected their assignments or practices with OER, it was not always clear how the affordances of OER or open licensing related to these practices. For example, an instructor described assigning students to present and defend proposals to a panel of students using an OER rubric to check that students have each component complete. The instructor said that the benefit of OER in this case is that students are able to use the OER rubric to check their own work against the rubric as they complete the tasks, making sure they have the necessary components. As a result, the instructor said all students earn at least an A- on the assignment. Nevertheless, it was not clear why OER was needed to

Student Ownership: Creating a History Textbook

A history instructor increased student agency and created an open classroom community by asking their students to contribute to a course textbook. Throughout the course, students conducted research and worked on their own or in small groups to create a final written product on a topic of interest. The instructor focused class time on the writing process and facilitated meaningful interactions in which students provided feedback on their classmates' drafts, thereby empowering student voice in the learning process. Students created what the instructor called a "unique" and "insightful" written product about their chosen topic for the instructor to incorporate into the course textbook. The textbook acknowledged students' individual and group. In our interviews, the instructor highlighted how crediting student contributions enhanced students' connection to the material:

> "…The biggest feedback I get is that they are really excited about seeing the words of their peers in something that they use to learn the U.S. History. They like the fact that …there is not some sort of unknown person out there who wrote this textbook that they are reading about, that the only person that knows the significance of the author is the instructor who assigned the book. They know that [the author] was somebody who took this class last semester, last year, or 2 years ago. They get excited about that."

do this. Another instructor who sometimes used (in their words) more "open-ended and less traditional" methods asked for students' feedback on assignments in terms of which assignments they enjoy and which ones they

do not. The instructor saw this as part of the "open education process," "not just gathering the materials and then giving it to them, but also hearing their input about what they believe would be a very optimal educational experience for them…" While arguably a good practice, the connection to OER is unclear and defining "open" as any practice that takes student preferences into account would seem to include established practices such as student course evaluations.

Only a few instructors allowed student interests to substantially drive the direction and focus of the course. In general, instructors did not provide students opportunities to drive course content, citing that their syllabus is fixed, or that they faced challenges when attempting to involve students, such as difficulties in

coordination. Students in most focus groups did not feel they had a voice in substantively driving course content.

Increasing Inclusivity through Relevant Content

Nevertheless, the flexibility of OER enabled instructors to incorporate topics that are relevant to students' lives and tailor the course features to meet students' needs and backgrounds. Additionally, OER allowed instructors to bring in a more diverse set of perspectives by including authors from backgrounds not represented in traditional textbooks. Instructors also created opportunities for students to discuss and share their backgrounds, experiences, and thoughts in class.

Exhibit 4: Extent to Which Learning Activities in OER Courses Correspond to or Demonstrate Open and Culturally Responsive Practices

	Course	Student Agency	Inclusive Content	New Knowledge Creation	Critical Consciousness	Classroom Culture
Students read an article called "Black Boys Matter" and post a personal experience or reaction to the article on a fake Twitter account.	Wellness of the Young Child	+	++	+	++	++
Students examine air quality in the school's community and how it affects long-term health/wellness and education.	Wellness of the Young Child	--	++	+	++	+
Students read about variation in international health care to understand how systemic biases/prejudices (racism, xenophobia, gender inequality, homophobia, transphobia) affect health outcomes.	Global Health Studies	--	++	+	++	+
Students create a proposal for addressing a community issue as a final project.	English 101 Reading & Composition	++	++	+	+	++
Students implement the final community-based project they proposed in the lower-level Reading and Composition course. Ex.: Work with Asian-American/ Pacific Islander group to provide 500 blankets and 500 art kits for children.	English 205	++	++	+	++	++
Students discuss how to fix social problems and what they would start a revolution to fix them. They review social media sources and identify what they would use to start a revolution. (Note: the instructor referred to this as "arming students with OER," implying that he thought of social media sources as OER).	Cultural Sociology	+	+	+	++	--
Students go through a problem-solving process and take it to the next level by creating an openly licensed product proposing a solution to an issue (ex.: students created a webpage with a blog focused on education for incarcerated students that uses an open license so others could reuse and remix content).	Introduction to Teaching	+	+	++	++	--
Students can show their learning by taking a test, making an integrative video of 3 chapters they just read, writing a test with descriptive/analytical questions with answers, or writing and sharing a blog integrating chapters with real-world case studies.	Anthropology	++	+	+	++	+

Legend: ++ = Strong demonstration   + = Moderate demonstration   -- = Does not demonstrate

Tailoring Course to Meet Students' Needs and Backgrounds

As evidenced in both interviews and course observations, some instructors felt that OER provides flexibility to customize the course for their students and described how freedom from a traditional textbook gave them more flexibility to modify course design and "change out" materials like "Legos." For instance, one instructor said, "…In almost every section and almost every chapter, there is something that connects back to everyday life, that connects to what people are doing no matter whether it's in personal life or in business or a field that they are choosing to go into, there is something for everybody in the class." Another instructor added that OER allowed them to "find four different ways to teach the same concept," enabling instructors to meet the needs of diverse learners. In contrast, the instructor viewed a textbook as "one size fits all."

Furthermore, a few instructors reported that the added flexibility allowed them to be more intentional in aligning course goals and assignments with students' needs and interests. For instance, one instructor described conducting a survey at the beginning of the course to solicit information about student interests so the course could be tailored. Another instructor regularly collects student information during the first week of the course in a spreadsheet and then looks for opportunities to connect to their interests.

Instructors also incorporated current events into their course activities and lessons, with one instructor explaining, "Any time there is

a significant event that's occurred that has to do with the environment, I'll immediately go into my course and add it and make sure it's there for the next time. Climate change is one of those things that changes every day." In addition, instructors also updated assignments to make them more relevant to real-world issues and considered students' backgrounds and needs. Several instructors created assignments and assessments that were grounded in local or real-world contexts. Assignments asked students to propose a solution to a problem in the community or provided students an opportunity to discuss in depth a social issue. For example, students in one class created an anthology of OER works that were about local issues, such as stories about their local tribes, and hosted it on the OER commons, while students in a literature class read books by local authors on topics of concern to their community, such as immigration.

Further, the transition to OER materials can open space for richer and more student-driven classroom discussions. For example, an instructor described spending more time on topics that students are interested in during class discussions. This instructor described how the use of OER changes classroom practices: when using traditional course materials, they felt obligated to move through the full deck of publisher-provided slides and often moved past student questions. Now, the instructor lets student interest drive the conversation. The instructor asked students their opinions, broke students into groups to discuss the topic, and assigned them to go more in-depth with researching the topic:

"As I started moving away from that and started OER, I would have the whole PowerPoint slides from before and I would get to three…because we would start talking and I would let the students to drive where we were going to go in the context of this idea, but what interests you, what do you have questions about?"

Yet not all instructors were able to connect course content to real-world topics, citing discipline-specific challenges. For example, one mathematics instructor refrains from incorporating real-world problems into their precalculus course because such examples feel "contrived" since calculus is disconnected from day-to-day realities. Another common barrier to using more relevant materials was the availability of OER. Some instructors struggled to find OER required for their courses, reporting issues with quality, accessibility, and content. A few instructors

"Being relatable is how I teach general biology… There is always a hook. So, when I do molecular biology…I relate it to food… When they do chemistry, the chemistry of food, the molecules that make up food and they learn about how to eat better…Cells. They learn about cells from the point of view of a fat cell to start out, and then they learn all about that, which goes into health once again. I always try to have a hook somewhere in there, where I'm not just going to show them a cell, but I'm going to relate it to something that they care about."

- Instructor

from more advanced STEM courses with specific textbook requirements reported that there are few, if any, OER textbooks or supplementary materials available for their courses. On the other hand, several humanities instructors reported difficulties in finding open materials from diverse authors. Two foreign language instructors struggled to find or create OER that immerse students in a target language in the same way that publisher-created resources do.

Not all participants saw these discipline-specific factors as insurmountable obstacles to effective OEP implementation, with one interviewee stating that the discipline is not "the deciding factor. I think it's the faculty member who is the deciding factor."

Incorporating Diverse Perspectives

Instructors also reported that OER have allowed them to enhance the cultural relevance of their content by allowing them to bring more diverse perspectives and voices into the materials than might be covered in publisher materials. For instance, during one observation, an instructor shared examples of creative non-fiction from authors of color writing about race/class in America, terrorism, rural America, and environmentalism. Another instructor explained how they assigned a text from a Vietnamese author who reflected the background of many of the instructor's students. The instructor shared that many students appreciated reading text from an author with a shared background:

"They read a graphic memoir…written by…a Vietnamese writer. [The college] has a huge Vietnamese population. A ton

of my Vietnamese students emailed me, saying, 'Thank you for selecting this book. It's about my culture. I related so much to it.' Those things are really important to me and OER allows me to do that. Whereas a traditional textbook does not."

Another instructor observed that tenets of open education can sometimes conflict with each other. He wanted to assign texts written by less established authors of color and acknowledged their need to be compensated for their intellectual creations.

To further increase the diversity of voices in the course, some instructors also offered students opportunities to share their perspectives, backgrounds, and interests in assignments and discussions. For instance, some instructors centered assignments around a field of interest to students in the course, asked students questions about their own experiences, perceptions, or opinions through open-ended questions, or created opportunities for students to share their views on the reading or class topics. In a few instances, instructors reported gathering examples or questions from students and incorporating them into the course text so that students better connect with the materials.

Creating Opportunities for Knowledge Creation and Collaboration

More than half of instructors described organized activities and assignments that facilitated the generation of new knowledge or the application or evaluation of course content. In over half the sites, instructors asked students to help select course materials or to create OER material that would be added to the course OER textbook as an instructional resource or shared their work with future students taking the class. Instructors also created assignments based on real-world scenarios or social/community problems. However, fewer instructors described themselves as learning alongside students as part of these collaborations.

Inclusive Content: Teaching Plays from Diverse Perspectives

An instructor brought inclusive content into his theater classes by consciously choosing plays that were written by a diverse set of authors and that addressed issues relevant to students and their communities. In the introduction to theater class, the instructor used an OER textbook and supplemented it with other publicly available materials. Because it is an introductory course, there are both majors and non-majors in the class that come from a wide variety of backgrounds. To reflect the diversity of students in his class, most of the plays taught in the class were written by women authors, queer authors, and playwrights of color. The instructor also uses publicly available materials, from Project Gutenberg, in their History of Theater class. In this class, the instructor and students read the plays on an e-learning platform on which they can collaboratively annotate the plays and comment back and forth. This allows the instructors and students to collectively engage with the plays in a way that is not possible with a textbook. The instructor described how the topics addressed in the selected plays, in both classes, reflect issues that feel timely and relevant to today's world. In addition, plays come from different countries and time points, such as Ancient Greece, India, and China, Medieval Europe, and the Spanish Golden Age.

Asking Students to Contribute to Course Materials

Some instructors asked students to help curate or create material for the course and incorporated student-created examples into the course. In one instance, students created a webpage with a blog focused on education for incarcerated students, publishing with an open license so others could reuse their content. Another instructor asked students to create a library of course texts, saying students are "…creating the library, they are creating the texture, the theme, their flavor; their interests create the texture of the class collaboratively." A third instructor asked students to collaboratively create products for the class OER textbook. The instructor reported that students appreciate that the book contains text from peers and not anonymous authors.

"The biggest feedback I get is that they are really excited about seeing the words of their peers in something that they use to learn U.S. History. They like the fact that it's not just some nameless, headless, faceless… floating head [writing the book]."

- Instructor

Students in more than half the institutions in the study were involved in creating OER materials that are used as instructional resources, either in the courses in which they were enrolled or for future classes. In one example, students worked in groups over the semester to research a historical topic of their choosing. Unique research contributions stemming from students' group work were incorporated into an OER history textbook. Instructors acknowledged students' contributions in the final OER product.

Generating New Knowledge: Creating a Lab Manual

In one human biology course, students helped to create an open lab manual. The biology instructor was motivated to create an open lab manual to help cut down on the cost of course materials for students. When they were unable to find uncopyrighted photographs of dissections to include in the lab manual, the instructor decided to replace the open lab quiz assignments with photo labeling projects. Each week, as students dissected organisms, they were required to take a photo of the dissection, label the structures in the photographs, and submit the photographs for credit. The instructor chose photos that students took of their dissections to include in the course lab manual. If a student's photo was selected, the instructor credited their submission in the lab manual, which helped increase students' investment in the project. In using students' images in the manual, the instructor created an opportunity for students to create learning tools for future students that reflected students' own experiences and perspectives in the class. According to the instructor, the resulting lab manual included "unbelievably beautiful photographs, better than some of the ones in the lab manual we were using."

Assigning Activities and Assignments for Students to Generate, Critique, or Apply New Knowledge

Several instructors asked students to apply, evaluate, or generate new knowledge by incorporating more project-based activities during which students were creating, thinking, or investigating. For instance, instructors asked their students to demonstrate their learning in a variety of formats, such as presentations, videos, infographics, songs, or debates. Multiple instructors also described discovery-based or project-based assignments that ask students to assess or analyze real data or texts on modern-day issues. In addition to asking students to complete assignments and tasks based on real-world examples, instructors also asked students to prepare assignments that were "renewable." For example, one instructor describes how the papers they assign are designed to allow students to share their new knowledge with others.

Another instructor noted how excited students are to create "digital artifacts" that will live on in social media platforms once the course has finished.

However, we observed only a few examples in which students were critiquing knowledge in connection with OEP. In one class, students critically evaluated sources to determine their credibility, while in another the instructor asked students to provide counterevidence if they disagreed with something said in class. More commonly, instructors asked students to reflect on new or existing knowledge, asking them to make connections with their personal lives or to offer their opinion without engaging in critical evaluation.

> *"I get our students to think that their papers that they write for my classes are not just things that they submit to get a grade, but that they can actually take the content and the research that they put into it and disseminate to the rest of the world and share that knowledge that they gained."*
>
> - Instructor

Additionally, the majority of synchronous and asynchronous course observations yielded few examples of class activities, practices, or interactions through which students created new knowledge. One STEM instructor seemed perplexed by the idea that their students could be expected to contribute new knowledge to a very mature field, suggesting that faculty ideas about what new knowledge generation looks like can be expanded to include application and analysis.

Promoting Collaborative Learning

Many instructors tried to facilitate collaboration through assignments and learning activities ranging from completing class activities in groups to completing group assignments. In online courses, these mostly involved discussion boards as opposed to group projects. Again, this may reflect the shift to online, remote learning during the pandemic. In a few instances, students had the chance to discuss or share their learnings with other students in the class. Several instructors facilitated greater student collaboration through the use of technology tools. For instance, two instructors asked students to annotate texts using an interactive online program, which allowed students to engage in more authentic expression compared to discussion boards.

Instructors also used peer groups to increase students' comfort with material (e.g., reduce math anxiety; increase comfort in math by explaining concepts to peers). One instructor said they want students to feel responsible to each other (feel needed and also help others in need) and another said that they ask students on quizzes to name who helped them in class or who they had helped to validate peer-to-peer support and get a sense of student-student engagement.

> *"I don't pretend to know everything ever, and I want us all to continue to learn and grow together. I really think that OER allows that to happen. Versus an original textbook that says, 'This is the only way we're going to do this.' So, it just helped really streamline my passion for being in a classroom with students and the fact that we're all learning together."*
>
> - Instructor

A few instructors mentioned learning alongside students. Rather than positioning themselves as "experts" on the subject, these instructors positioned themselves as learners as well, acknowledging that students also have knowledge to contribute to the class. For instance, one instructor felt that OER enabled them to learn alongside their students more than would a traditional textbook.

These instructor reports suggest that affordances of OER typically factor more directly into instructor-student collaboration than student-student collaboration. OER shows there are more ways to learn than top-down can break down traditional hierarchies

of authority around knowledge creation, opening up possibilities for instructor-student collaboration and ways that might not be necessary for collaboration among students. Collaboration among students took on a wider variety of forms, some of which did not involve OER or content creation.

Raising Students' Critical Consciousness

Some instructors made attempts to develop students' critical consciousness and engage in social justice issues. In a few courses, such as sociology, English/literature, or anthropology-based courses, addressing issues of social justice was a central focus. These instructors prioritized the development of students' critical consciousness in the course through core readings and assignments. In most courses, however, instructors were more likely to incorporate isolated examples or activities aiming to develop students' critical consciousness without this being a key goal for the course.

In a few courses, instructors used core readings and assignments to address social justice issues and/or aimed to develop or grow students' critical consciousness around current events and issues. In some assignments, students reacted to readings; for example, in one class, students read an article called "Black Boys Matter" and posted a personal experience or reaction to the article in the course discussion; in another, students read about how issues of racism, gender inequality, or homophobia diminish access to quality health care and health outcomes. Other assignments included a more in-depth study of

social justice issues; in one course, students completed a research project on health inequities and discussed how the health care system exhibits racial biases against people of color, while in another, students wrote and gave speeches about societal issues and proposed solutions.

More often, instructors addressed social justice issues through isolated examples or activities. For example, a few instructors described wanting students to be more aware of societal issues and assigned readings on social justice issues. One instructor explained how they hope that reading these texts starts the conversation on these issues: "If I can get them to learn about police injustice by having them read a book about it, that's my role. That's where I come in and that's my contribution to social justice, and then from there, they can develop what their contributions would be." The instructor did not describe engaging students in further discussion beyond having exposure to the readings. In general, courses varied in the extent to which students and instructors discussed topics around social justice or current events. In some classes, students discussed topics such as gender and race relations and how specific discriminatory behaviors persist today. In a few courses, instructors noted that the local context and/ or student perceptions around social justice topics made it challenging to discuss social justice issues.

However, during our course observations, we observed little evidence of the development of critical consciousness in courses. In the few observations in which lessons did touch on social justice issues, they were not the

primary focus of the class. Most instructors also did not report examining their own power and positionality with respect to students. In general, the use of OER materials was not related to discussions or assignments that aimed to develop students' critical consciousness, though a few instructors noted that they were able to select no- or low-cost readings that address these issues. Overall, courses varied in the extent to which students and instructors discussed topics around social justice or current events.

Building Safer and Inclusive Classroom Culture

Most instructors described efforts to build inclusive and caring classroom cultures, though they rarely made explicit connections with equity. To achieve this, instructors tried to build personal relationships with and among students through assignments and activities like discussion boards, group activities, and get-to-know-you journals. While classroom culture was difficult to assess in an online setting, interviews and observations suggest that instructors made concerted efforts to build positive, safer, and welcoming classroom cultures. Typically, these attributes of the classroom culture did not explicitly rely on the use of OER.

Increasing Students' Safety, Comfort and Engagement in Class

A key goal for instructors was to increase students' comfort, confidence, and engagement in both the class content and in themselves. In subjects such as math, statistics, or public

speaking, instructors wanted students to feel less anxiety around the subject and to feel comfortable asking questions and participating. In other subjects such as political science or writing, instructors wanted students to engage more in the topics and freely express their views and ideas.

Several instructors also aimed to build an environment in which students felt safer to make mistakes and learn from them and share opinions without judgment. One instructor recounted a student comment: "I appreciate that I always feel like I am safe and I'm cared for in this class so that we can have this open dialogue whenever needed." To achieve this safer space instructors tried to be more inclusive of students' views by guiding discussions, showing they want to hear everyone's views, and validating students' voices. Instructors sometimes implemented practices that could be viewed as encouraging a growth mindset—i.e., the idea that improvements can be achieved through efforts and learning from mistakes. For example, some instructors offered students extra credit, the chance to redo assignments, or opportunities to improve their grades.

Getting to know Students Personally and Build Community

As evidenced by interviews with students and instructors, instructors often offered students advice and support, including in other classes and about their personal lives. One instructor shared how they try to form a personal relationship with each student by gathering and mentioning student-specific details when interacting with students.

To create a welcoming environment, instructors made themselves available to students via office hours, outside of class, and by email. Instructors also shared personal information about themselves (e.g., personal lives, honest stories of their successes and failures) to build authentic relationships with students, be relatable, dispel myths of success, and share examples of overcoming barriers. Instructors asked students about their state of mind and checked in on students before, during, or after class. Breakout groups also helped students feel more comfortable in class and have students get to know each other.

> "I...keep a spreadsheet and...have information about the students right there in hand, so when I'm talking to them or I'm grading or responding to their discussions, that I throw some of that in. I know they are a soccer player; I know that they like to go to Japan. I throw in those things... so they see I'm paying attention to them. I think that makes a big difference. I think that makes a big difference."
>
> - Instructor

Additionally, instructors facilitated peer interactions through group projects or activities to build a sense of community. For instance, one instructor started the semester with a group project in which students shared information about themselves and learned about each other. As a result, the instructor reported seeing relationships forming in the class. Some instructors tried to facilitate greater peer interaction through assignments, often through discussion board posts in online or hybrid classes. Many instructors reported

using group work and discussion boards to facilitate student-to-student interactions, though a few reported having to mediate some conversations, especially around topics of social justice or controversial topics.

In general, instructors did not draw connections between these practices and the use of OER or a culturally responsive stance. It was unclear how often the adoption of OER opened up space for these practices and prompted greater student focus. A couple of instructors said that fostering student-centered class environments had always been their approach and had no connection to OER.

Transitioning to Remote Instruction

Interview participants varied in their assessments about the impact of the transition to remote learning on OER adoption and OEP. One instructor had less time to devote to improving their use of OER materials because they had to focus their attention on online instruction, suggesting that they viewed OER-enabled instructional practices and online teaching as two distinct pedagogies. However, other interviewees said that the pandemic facilitated the increased use of OER materials because these materials are available digitally. Participants also described how the online environment facilitated the use of OEP, such as asynchronous student-instructor interactions and synchronous student interactions through breakout rooms.

Several instructors noted that online learning made it difficult to build classroom culture. Many times, students had their cameras off and would "speak into a void," which decreased accountability and made it difficult to form connections and interact synchronously with

peers. Another challenge of online learning is that the learning management systems are often set up for more individualistic learning. One instructor teaching at a Hispanic Serving Institution stated a belief that online learning was harmful to students at their institution, particularly for Hispanic and other students of color who the instructor said may prefer a more collaborative learning experience.

Views about asynchronous vs. synchronous online courses were mixed. One instructor said that he felt the asynchronous format strengthened interactions because students had time to respond to one another individually, and students tended to form relationships with other students who routinely completed discussion post assignments at the same time of the day or week. Another instructor reported that online resources allowed more opportunities for students and instructors to interact since instructors and students could collaborate online through annotating texts together or students could collaborate online rather than just listening to a video lecture. However, a few instructors said that asynchronous teaching has been difficult. One instructor said that he had not found a way to generate authentic dialogue in this modality, and several instructors and students reported lower levels of participation.

V. How these Practices Affected Students

How did the use of OEP enabled by OER affect students' perceptions of their learning, sense of belonging, agency, and engagement?

In focus groups and interviews, students spoke about certain open practices used in their OER courses that they felt improved their learning and increased their sense of comfort, agency, and engagement in the courses. In particular, they highlighted the flexibility to make choices about what kind of assignments and assessments to complete, the use of inclusive content that felt relevant to their lives, and the facilitation of a safer classroom culture. The students we interviewed did not explicitly connect these open practices to the use of OER, although it could be that the use of OER enabled instructors more generally to focus on their students. Additionally, the students we interviewed said little about the impact of critical consciousness or new knowledge generation on their learning, engagement, and sense of belonging in the classes.

The findings that follow should be considered together with the possibility of response bias, given that only 14 students agreed to be interviewed. Students who responded to the call for participants may have been especially engaged and/or had especially positive experiences in the course.

More Choice Gave Students a Sense of Agency

Students said that they liked the flexibility instructors gave them in their OER courses because it gave them a sense of agency over their learning. For example, one of the students described how the instructor gave them a variety of ways to demonstrate their learning. They explained how they were more successful in their OER course than in other courses because they were able to choose the essays they wanted to write and the prompts they wanted to respond to. "I think there are lots of different ways that she gives for us to demonstrate our learning. So, it's not all just based off of a quiz or one paper or things like that. We can choose the essays that we want to write, we can choose what type of prompt we're going to be responding to as opposed to do this one specific assignment." Relative to other classes, this choice made the student feel more comfortable and inclined to participate in this class, which ultimately helped them learn more.

> *"I feel in this class...I'm more apt to answer questions and respond and not feel as shy or intimidated because I have my own choice of how to answer and respond to things...I feel I've learnt so much more in this type of class environment where it's more open."*
>
> - Student

Other students also said they were given choices about assignments and assessments. Similar to what we heard from faculty, the most common choices students were given were over what topic they wanted to write about and/or how they wanted to demonstrate their learning.

Inclusive Content Increased Students' Sense of Belonging and Connection to the Material

A few students reported that what they learned in their OER courses felt relevant and applicable to the real world and that made them feel more connected to and represented in the course. For example, one student described how they got to draw upon their own life experiences for their coursework and that this made the class more interesting. "We got to take our own stories...and write what you're doing within your life, and I loved that…I think the class has materials that are relevant to today and interesting." They also said that because this course brings in writing from various people and perspectives, everyone in the class felt represented in the readings.

> *"I guess I would just stress the impact that this course has had on my life… I've already started looking at how I can advocate for environmental issues in my future career…I think a really, truly successful class is one that makes you care…I would definitely say that this was one of those classes."*
>
> - Student

Another student spoke about how the environmental issues she learned about in her biology course felt so relevant to her life, that she made changes to her lifestyle based on what she had learned about climate change and sustainable living. She said that a successful course makes you care about

the topic and that this class did that to such an extent that she considered changing her major. This students' experience exemplifies how using inclusive content can lead to higher levels of engagement that may result in students continuing to engage in the subject after the course concludes.

Three of the students we interviewed, however, said they did not feel like students were given an opportunity to influence what material or examples were used in class. "I think the course was already pre-designed before we even logged in. All the materials are selected by [the instructor]."

Building a Safer Classroom Culture through the Fostering of Positive Interactions

In addition to increased student agency and inclusive content, students we interviewed also said their OER class had a collaborative, safer, and open classroom culture, mirroring the reports from instructors. They described how the instructors created this classroom culture by fostering positive relationships among students and between students and the instructor and said these relationships increased their level of comfort and engagement in the course.

Several students spoke about their interactions with instructors and how those made them feel comfortable and safer in the class. One student explained how her favorite part of the class was her relationship with her math instructor. "What I liked most about the class actually had nothing to do with the material that was covered. It's actually [the instructor]

herself…she is very approachable; she is very open to her students. She cares about how they are doing, not just academically but in their lives in general." A student in another class said that because her instructor was welcoming, many of them felt comfortable attending office hours to get additional support. These findings support the instructors' claims that they create welcoming classroom cultures by making themselves available to students for support and advice.

In addition to feeling safer and comfortable interacting with faculty, a couple of students expressed feeling a sense of mutual respect with their instructor. "…She's very respectful about everything and she's very neutral. She doesn't want to make her opinion the only important opinion; she wants to hear everyone's opinions." This instructor was intentional about not elevating her voice above the students. Because the instructor made it known to students that her voice was not the only one that counts, and that she was interested in learning alongside students, she was able to successfully create a classroom

culture in which students and faculty could engage in open and collaborative discourse.

Students also described how the interactions they had with other students in their classes contributed to positive classroom cultures. For example, a student said that their statistics instructor used breakout rooms effectively to build students' comfort with each other despite being on Zoom. This student went on to explain that working together as a group helped them to understand the material better. Another student described how the instructor requires everyone's videos to be on and gives everyone the freedom to express their own opinions. Because the instructor took steps to establish a respectful environment in which students were encouraged to share personal experiences, students felt comfortable sharing and developed a sense of belonging in the class.

Not all students, however, felt there were regular interactions between faculty and students and among students themselves in their OER courses. A couple of students attributed this to the challenges of online learning due to COVID-19. One student said that they interact with students casually during the first 5 minutes of logging on, but other than that, students do not share much about their personal experiences and backgrounds with each other. Most of the students described their OER classes as having safer classroom cultures that were facilitated by positive interactions between faculty and students and among the students themselves. They appreciated having greater flexibility, finding course topics relevant and applicable to their lives, and their instructors' efforts to build a sense of community.

A professor's journey into open education

A biology professor described his journey to adoption of OER and OEP in online biology courses. His transition to OER began about 10 years ago with an introductory biology course, because "I was tired of having a textbook…I was tired of having to reshuffle the structure of my course because they just changed where the chapters were." He also found he often disagreed with the way publisher textbooks presented ideas, didn't enjoy reading them, and didn't want to make students pay for new editions. He had already developed his own content over time that accounted for about half the course content and then used OpenStax for the other half. In order to maximize his control of the course materials and present the course with his college's branding, he imported OpenStax content into his own HTLM template and augmented it with his own videos and pictures to "make it my own." Over time, this professor developed coding skills in order to implement his vision of his course: "When I discovered OpenStax and learned how to computer code, I was able to just create something that said it the way I wanted to say it and something that I could change every semester to make better and better without waiting three years for a textbook update." He has since become a resource for other instructors who need technical assistance modifying their courses.

That introductory biology course continues to be in use, though this professor no longer teaches it. He has moved on to another course in Environmental Biology which is delivered online asynchronously and used OER from the start. With encouragement from his dean, the professor recently incorporated "open pedagogy" into the course. According to the instructor, the students drive the course content by finding articles, videos and other resources that interest them and that get integrated into the next version of the course, suggesting that he interprets OER as including all freely available content on the Web, regardless of licensing. The instructor says that students get excited about creating digital artifacts such as TikTok videos and Twitter posts that live on and aren't just "forgotten" in a learning management system at the end of the semester. "It's really about having the materials go beyond the learning management system and to be more out there in the world."

The professor's aim in the course is to change the way students live to embrace more environmentally sustainable choices. For example, he assigns them to keep journals of food and water consumption to track their environmental impact or to identify one habit they wish to change. He also wants them to take an interest in learning about nature and science and to become lifelong learners and uses the strategy of assigning students to watch documentaries on their streaming services (e.g., Netflix and Hulu) so that those types of videos pop up in their recommendation streams.

His strategy may be working. One student who participated in an interview, a mother of two small children, said that the course had influenced the way she lives her day-to-day life, making her much more conscious of choices she makes with environmental consequences, and also changed her plans for her degree and career path to focus on environmental issues.

VI. Institutional Role: Supports, Gaps, and Possibilities

What college institutional policies and practices support or impede implementation of OER-enabled OEP and culturally responsive educational practices?

When asked about institutional policies and practices that either supported or impeded implementation of open and culturally responsive institutional practices, interview participants generally focused on supports or barriers to the expanded use of OER materials instead. Even in cases where administrators described visions of what OEP should look like, they generally did not describe the same degree of institutional support or identify policies to put those principles into practice as they did with incorporating OER materials. Instead, institutions have created resources like teaching and learning centers or virtual collaboratives to support instructors who choose to implement OEP in their classrooms. These varying types of support for OER and OEP suggest that while community college leaders are open to promoting the use of new instructional materials, they are hesitant to encourage or direct their faculty to adopt specific instructional practices. Administrators typically pointed to cost savings, access, and ability to make content more inclusive as the affordances of OER that address equity.

Institutional Policies and Administrative Leadership

Interview participants described a stark difference between the institutional policies that address the adoption of OER materials and the implementation of OEP. These institutional leaders play a significant role in

propelling OER adoption at their college by prioritizing OER initiatives and incorporating them into their strategic plans. Administrators from six sites said that their strategic plans and board policies include converting courses to OER. Institutional policies and employment or union contracts may also include direct and indirect supports for OER implementation. For example, one site incorporates financial incentives for developing OER courses into their employment contracts to encourage instructors to use these materials, while another site's contract with the union guarantees faculty the freedom to use any text they wish, including OER materials.

> "… [Support for OEP] is something that I think would be a great next step for us, because again, I feel like where we're pretty mature in terms of utilization of OER I don't know that we're fully mature in terms of OEP, in terms of a lot of the practices, but I feel like that's our next phase."
>
> - Administrator

Significantly, these institutional policies typically do not address the use of OER-enabled open education practices. An administrator at a college that does not encourage instructors to adopt specific practices or pedagogies explained that they have a "very strong adherence to academic freedom." Instead of campus-wide policies that

embrace OEP, institutions are more likely to provide resources or supports such as teaching and learning centers that practitioners can voluntarily use to improve their instructional practices. One administrator's response suggested that the institution does not hold instructors accountable for OER-enabled instructional practices yet because it has not reached the same level of acceptance as OER adoption among faculty members.

Financial Resources

College faculty members identified financial supports for OER adoption, but they did not name sources dedicated explicitly to expanding or improving the use of OEP. Institutions provide stipends to help OER leaders attend professional development sessions and train other faculty members in using and creating OER materials and courses. Colleges also compensate faculty members for creating resources for other practitioners. Some participants called for their

institutions to take additional steps to address the considerable amount of time it takes to create OER materials, but they did not call for financial resources to support the adoption of new teaching practices related to OER. While access to these resources communicates an institutional commitment to OER, faculty participants generally did not view them as indicating support for OEP.

Trainings and Fellowships

The majority of institutions offer optional training sessions on OER, and some facilitate trainings on OEP. When they do occur, trainings on OEP are typically infused into other types of professional development, like trainings on OER, online teaching, pedagogy, or online learning platforms. An administrator described how they "sneak" training on open pedagogy into the end of their trainings on OER, suggesting that participants are less likely to attend a training focused specifically on open pedagogy. One site offered more

robust support for OEP implementation, as teachers get a stipend for observing other teachers' classes and discussing and creating a video about what they learn related to OEP. They share their learning on a college-wide video repository. Overall, this level of institution-wide direct encouragement for the use of OEP in classrooms was unique among participating institutions.

> *"Also, I would say, one of the highlights is this [program] faculty showcase. At the end of that fellowship, there is presentations on how OERs are incorporated in, and I tell you, the ideas, the pool of ideas of how faculty at [college] are using OERs is just amazing. It's unreal. It's just like wow, really, that's what you did? You even see an increase of faculty collaboration because it does give us that more interdisciplinary approach to teaching and learning."*
>
> - Administrator

Several institutions offer intensive OER/OEP fellowships. While these are more selective and serve fewer faculty than in-house trainings, they focus more explicitly on OEP or full-course redesign. An administrator described how their institution's open pedagogy fellowship helps them to not just create open courses but to "make open faculty." Some fellowships support participants in sharing their learnings and best practices with other faculty members at their institution.

Other Supports for OEP

Institutions provided several other types of open education supports, primarily for OER course development. Some institutions have created formal faculty committees or groups to support course redesigns and/or the implementation of teaching and learning strategies associated with OER. An administrator described how such a "community of practice" supports faculty discussions about OER-enabled instructional practices at their institution.

At least two institutions have created online platforms where faculty members can share materials and innovative practices with one another. They can post notes, activities, and instructional resources that any instructor can access and use in their own courses. One of the platforms also supports discussion boards where contributors can post examples of how they incorporate OER materials and OER-enabled instructional practices into their classrooms. An administrator in one institution primarily posts trainings and activities with another faculty member and would like to see more instructors use this virtual learning collaborative to share ideas and strategies with one another.

Teaching and learning centers help college faculty and leadership disseminate innovative instructional strategies, including those related to open pedagogy. An administrator described how their institution's teaching and learning center holds workshops on teaching practices, including those that involve the use of OER. They organize professional development sessions and conferences where

a recent guest speaker discussed inclusivity in pedagogy, and they have facilitated virtual conversations and panels to discuss the benefits of using OER. Another administrator said that their institution plans to set up a teaching and learning center to promote OEP as they embrace "innovative ways to reach our students," although the center's development has been delayed due to limited funding.

> *"I think what this kind of community of practice brings is not only an examination of OER but of course examination of how would I teach with an OER text. What are the best practices, and because now it's a collective rather than an individual who was interested to begin with, we're bringing more faculty to the fold, and we're also having good pedagogical conversations—so that shared governance, and we are supporting those faculty members who participate in [program]."*
>
> - Administrator

Interview participants described additional institutional venues for supporting the expanded use of OER materials and OER-enabled instructional practices, including faculty conferences, new faculty institutes, and fellowships. At one site, faculty members participating in a fellowship have the opportunity to share their work and ideas with their colleagues through a showcase.

Support for Culturally Responsive Pedagogy

Administrators often identified equity and access as a focus of their OER initiatives. Some interview participants vaguely described what they meant by "equity" during their interviews, and others did not expand beyond the benefit of lowering the cost of materials. Eleven administrators across six sites described how OER enables instructors at their institution to bring more culturally responsive content into their instruction because they can customize the material to reflect their students' backgrounds and/or experiences. In some sites, students work with faculty to identify or create course materials, and this helps to increase engagement.

A small number of interview participants identified explicit institutional efforts to support faculty members in effectively addressing diverse student learning needs. These include trainings on trauma-informed and anti-racist teaching; reading groups, committees, or other campus organizations focused on social justice; and supports for interpreting data from underserved or other socially significant student populations.

> *"If students are helping build materials or students are bringing materials to faculty that are relevant that are open, that they can then use in the future or if they are even creating materials that our faculty can use in the future, all of that drives engagement and all of that drives relevancy."*
>
> - Administrator

Barriers to OER Expansion and OEP Implementation

Interview participants identified several barriers to OER adoption that have been well documented in prior research (including in the OER Degree Initiative report)[63], such as the time required to locate and vet high-quality materials. Concerning OEP, interviewees described how the perceived risk of trying unproven strategies dissuades instructors (especially untenured faculty) from implementing alternative teaching practices. An administrator suggested that faculty members may see open pedagogy as an example of an instructional approach that gets into an administrator's head "that this is the thing we should do," and attributed instructors' resistance to "initiative fatigue." Additionally, community college faculty must navigate course requirements that will ensure their students can qualify to transfer to a 4-year college or university, and some feel they have less latitude in what they can teach as a result.

Student resistance to unfamiliar practices can also be a barrier to OEP. For example, an administrator described a part-time chemistry teacher at their institution who centers his instruction around inquiry-based learning, and his students sometimes struggle to understand this approach. Practitioners need to explain and guide students through the new approach and expectations.

> *"Students love his class when they get it, but they have to get it. They have to be indoctrinated and have it explained, like this is going to look different, this is going to feel different…I do think that that applies to OERs and non-traditional pedagogies in general. You're always taking this risk of stepping outside of the expectation of a norm."*
>
> — Administrator

The benefits of trainings, policies, and other systems of support for OEP implementation are not universally felt at each institution. Some participants highlighted unequal access to trainings and grants that could support their use of OER. Institutions may also lack administrative leadership, formal program offerings, and internal networks that could increase staff awareness and the use of quality OER materials. One instructor said that while their institution has an "OER person…there is no cohesive, connected effort. We are all doing OER in little pockets on campus." Their college lacks a "game plan, a way to nurture and bring and facilitate other instructors and guidance through this journey."

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63 Griffiths et al. (2020). *OER at scale: The academic and economic outcomes of Achieving the Dream's OER Degree Initiative.*

VII. Discussion

Reflecting on our research questions of whether and how the adoption of OER can lead to implementation of transformative instructional practices, how students experience these practices, and the ways in which institutions support open and culturally responsive education practices, we have identified the following themes.

How Instructors Did (and Didn't) Use the Affordances of OER

We observed two categories of instructors using OEP in conjunction with OER—instructors whose use of OER facilitated their adoption of OEP, and instructors for whom the use of OER enhanced preexisting student-centered practices. For most community college instructors, the use of OER was an introduction to the flexibility afforded by the free resources, and for a subset of these instructors, the adoption of OER catalyzed changes in instructional practices. Many instructors described a progression from first adopting OER materials for their cost-saving benefits to feeling liberated from textbooks. For instructors already using some student-centered, collaborative pedagogies, introduction to OER materials opened a range of possibilities to further their practice.

Instructors primarily took advantage of OER being free to select materials of their choice, with a few asking students to contribute to or create materials. We also observed instructors using free or low-cost materials that were not openly licensed, as these offered them the same option to curate and assemble their courses.

In curating their own materials using OER and other no-cost materials, instructors started going further toward adopting open and culturally responsive instructional practices; they began to think critically about what topics they wanted to teach their students. Some instructors explained how they felt empowered to address material that they felt was a priority and of interest to students, and believed they had the freedom and flexibility to do so.

> Some instructors explained how they felt empowered to address material that they felt was a priority and of interest to students, and believed they had the freedom and flexibility to do so.

Relatively few instructors took full advantage of the benefits of open licensing afforded by OER. Some instructors revised or remixed materials and reported sharing materials with colleagues or through an online, discipline specific OEP activities repository. However, few, if any, published these materials (e.g., to OER repositories), suggesting that these community colleges lack access to opportunities to participate in this dimension of being an "open educator".[64,65,66]

64 Ehlers. (2011). *From open educational resources to open educational practices*, 1–8.

65 Nascimbeni, F., & Burgos, D. (2016). In search for the open educator: Proposal of a definition and a framework to increase openness adoption among university educators. *The International Review of Research in Open and Distributed Learning*, 17(6). https://doi.org/10.19173/irrodl.v17i6.2736

66 Nascimbeni, F., Burgos, D., Campbell, L. M., & Tabacco, A. (2018). Institutional mapping of open educational practices beyond use of Open Educational Resources. *Distance Education, 39*(4), 511–527. https://doi.org/10.1080/01587919.2018.1520040

Overall, instructors in the study were motivated to take up OER as a way to advance equity through the benefits of cost saving, accessibility for students, and relevant or customizable content. For those instructors who were already using student-centered instruction, OER was a powerful tool to enhance their practice; for instructors who were teaching using more traditional methods, the use of OER, coupled with tools and supports, may have helped them shift their instruction towards greater learner-centered practices.

Shifts in Instructional Practices and Mindsets from Use of OER

In using OER, instructors shifted their practices to be more inclusive and student-centered. Accompanying these changes in practice were some changes in instructor mindsets around the ways learning experiences may be facilitated for students, especially in focusing learning on students' interests and needs.

Changes in Instructional Practice

The instructional freedom afforded by OER motivated instructors to use open pedagogies, redesign their course structure, and revise course materials and activities. For several instructors, the switch to OER seems to have led to a shift to a different style of teaching in which they gave fewer traditional lectures and instead used class time to discuss examples or address students' questions. One instructor described this change as "slowing down" their practice; they were no longer racing to cover content and were taking the time to let students drive discussion. The use of OER

also prompted instructors to think more deeply about course objectives and take a more hands-on approach to align class materials and assignments with these objectives.

> Instructors who used open educational practices (OEP) reported "slowing down" their practice – they no longer felt they were racing to cover content and were taking the time to let students drive discussion.

Instructors typically interpreted "student-centered" instruction as getting to know students as people, incorporating current events, and giving students some choice in assignments and materials. In interviews and observations, instructors tended to emphasize connecting course concepts with students' real lives over developing their ability to think critically about complex phenomena, interrogate sources of information, integrate concepts, and debate ideas. In a few cases, instructors' use of OEP appeared to support the goals of student engagement and sense of belonging over critical thinking and other analytical skills; more research is needed to determine whether this higher level of engagement in turn led to deeper critical thinking and learning.

Discipline-Specific Challenges to Use of OER-Enabled OEP

Participants identified potential discipline-specific challenges to OER adoption and OEP implementation. While there are inherent difficulties in almost every subject area, a larger number of interviewees cited obstacles in the hard sciences, mathematics, and foreign languages than the humanities. It can be more

difficult for instructors in STEM subject areas to encourage students to share their voice when students inherently focus more on getting to the "right" answer than would be the case in social science courses. This does not mean that it is impossible to implement OEP in STEM subject areas, but that instructors may need more support in developing strategies to do so. While participants described how humanities instructors at their institution are more likely to incorporate culturally responsive practices than teachers in STEM subject areas, they encountered their own set of implementation challenges such as copyright restrictions.

Instructor Mindsets

A few instructors noted that they had already used these and other non-traditional teaching practices prior to adopting OER materials, such as student-led discussion, and did not believe the use of OER and OEP were necessarily connected. For these instructors, what we are describing as OEP may have already been a standard part of their instructional practice. Once introduced to OER, these instructors found the affordances of the free materials and the corresponding open philosophies to align well with and enhance their preexisting instructional approach.

Nevertheless, our findings also suggest that for other instructors, the use of OER materials led to a shift in instructor mindset that often corresponds with culturally responsive initiatives as well as related goals of the OER movement.[67,68,69,70] Not only did we observe shifts in instructors' mindsets around their role in designing and implementing instructional experiences for students, but we also noted that for many of them, their choice of course activities exhibited greater trust in students' interests, reasoning, and self-awareness. Instructors created opportunities for students to understand their own learning processes, learn information on their own, and share their perceptions, reflections, and ideas in lessons and activities, all of which require instructors to trust and value their students' ideas and experiences. Instructors also demonstrated awareness of the connection between student interest, course engagement, and learning.

> For many of them, their choice of course activities exhibited greater trust in students' interests, reasoning, and self-awareness.

Importance of Collaborative and Safer Classroom Culture

Across the board, instructors emphasized that they devoted significant efforts towards building a safer, collaborative, and interactive classroom culture grounded in trusting

67 O'Leary, E. S., Shapiro, C., Toma, S., Sayson, H. W., Levis-Fitzgerald, M., Johnson, T., & Sork, V. L. (2020). Creating inclusive classrooms by engaging STEM faculty in culturally responsive teaching workshops. *International Journal of STEM Education, 7*(32), 1–15.

68 Mellom, P. J., Straubhaar, R., Balderas, C., Ariail, M., & Portes, P. R. (2018). "They come with nothing:" How professional development in a culturally responsive pedagogy shapes teacher attitudes towards Latino/a English language learners. *Teaching and Teacher Education, 71*, 98–107.

69 Karunanayaka, S. P., Naidu, S., Rajendra, J. C. N., & Ratnayake, H. U. W. (2015). From OER to OEP: Shifting practitioner perspectives and practices with innovative learning experience design. *Open Praxis, 7*(4), 339–350.

70 Nascimbeni & Burgos. (2016). *In search for the open educator: Proposal of a definition and a framework to increase openness adoption among university educators.*

relationships and mutual respect. Students and instructors alike described the classroom environment as enjoyable and positive, which students said contributed to their greater interest and effort in the course. Markedly, instructors' focus on fostering a safer and inclusive classroom culture seemed unconnected from instructors' use of OER and OEP. However, we were struck by the emphasis on classroom culture across all classrooms in the study.

Numerous studies have emphasized the importance of classroom culture, climate, and connectedness in successful instruction and learning outcomes for students.[71,72] Instructors play a key role in facilitating an inclusive and safer environment, especially for students from historically underserved populations such as immigrant students or students of color.[73,74,75] As foundational features of OEP are collaboration, inclusivity, and empowerment of students as learners, it is no surprise that successful implementation of OEP requires instructors to value social learning and foster the accompanying classroom culture and values supportive of these practices.[76,77,78,79]

Indeed, as Ossiannilsson and Creelman write, "The mere use of OER is not enough to stimulate real change. Instead, a practice and a culture have to be developed so OER are embedded in the educational environments".[80] Without a safer space, a culture of sharing, and norms of interaction and trust, it would be challenging for instructors and students to engage in dialogue and shared collaboration required of OEP.

Less Implementation of Culturally Responsive Education

Implementation of culturally responsive practices was less developed than instructors' use of OEP. Instructors' primary connection to equity was often in the form of increasing students' access to free or low-cost materials that could be accessed from anywhere and were available in a variety of formats. These benefits of OER materials are an important first step towards more equitable instruction. However, the observed use of culturally responsive practices that align with prominent culturally responsive frameworks and that went beyond the use of accessible materials

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71 Prisbell, M., Dwuer, K. K., Carlson, R. E., Bingham, S. G., & Cruz, A. M. (2009). Connected classroom climate and communication in the basic course: Associations with learning. *Basic Communication Course Annual, 21*(11), 151–172.

72 Haukoos, G. D., & Penick, J. E. (1983). The influence of classroom climate on science process and content achievement of community college students. *Journal of Research in Science Teaching. 20*(7), 629–637.

73 Sadlier, H. (2009). College classroom climate: The professor's pivotal role. *International Journal of the Humanities. 6*(9), 47–51.

74 Becky, B. (2014). The Importance of the professor in college classroom climate for immigrant students. *College Quarterly. 17*(4), 1–20.

75 Kirby, L. A. J., & Thomas, C. L. (2021). High-impact teaching practices foster a greater sense of belonging in the college classroom. *Journal of Further and Higher Education*. https://www.doi.org/10.1080/0309877X.2021.1950659

76 Cronin, C. (2017). Openness and praxis: Exploring the use of open educational practices in higher education, 15–34.

77 Becky, B. (2014). The Importance of the professor in college classroom climate for immigrant students. *College Quarterly. 17*(4), 1–20.

78 Kirby, L. A. J., & Thomas, C. L. (2021). High-impact teaching practices foster a greater sense of belonging in the college classroom. *Journal of Further and Higher Education*. https://www.doi.org/10.1080/0309877X.2021.1950659

79 Ossiannilsson, E. S. I., & Creelman, A. M. (2012). OER, resources for learning—Experiences from an OER project in Sweden. *European Journal of Open, Distance, and E-Learning, n1*, 1–10.

80 Ossiannilsson & Creelman. (2012). *OER, resources for learning—Experiences from an OER project in Sweden*, 1–10.

was mixed.[81,82] We observed instructors using aspects of culturally responsive practices that overlap with OEP, such as using more inclusive content or topics or incorporating interactive activities. Some emphasized steps they took to build relationships with students and demonstrate an ethic of care.

We observed fewer instances of culturally responsive practices such as critiquing the dominant voices present in instructional materials or addressing the power dynamics within courses. Scholars argue that practices such as these can foster dialogue with students, develop students' critical consciousness and open the classroom to shared decision-making with students.[83,84,85] Though most courses did not explicitly address issues of social justice such as race, class, and inequality, the exceptions were humanities courses such as sociology and anthropology, in which these topics aligned well with learning goals for these subjects. Some courses focused on raising awareness of real-world issues (e.g., environmental sustainability) without a strong emphasis on social justice dimensions.

Few Changes to Core Aspects of Course Design

Our findings suggest that while many instructors were using at least some open practices in their courses, fewer had deeply transformed aspects of their course designs using OEP. Interviews and observations surfaced examples of nearly all dimensions across the five-course components. However, more discrete practices (such as renewable assignments) arose more frequently than ones that required instructors to rethink their position in relation to students or that involved yielding substantial control over course content.

Even amongst this carefully selected sample of instructors, some OEP principles were rarely observed, such as instructors learning alongside their students or examining their own positionality. Moreover, when instructors in this study described making changes in response to student feedback, the changes more often addressed student workload rather than course content. In general, instructors described tailoring course content to student interests rather than substantively empowering students to drive their learning.

In our observations of course practices, we saw more traditional lecture styles in which instructors usually imparted knowledge to students rather than learning alongside students. Observations revealed

81 Gay. (2002). *Preparing for culturally responsive teaching*, 106–116.

82 Brown-Jeffy & Cooper. (2011). *Toward a conceptual framework of culturally relevant pedagogy*, 65–84.

83 Sleeter, C. E. (2001). An analysis of the critiques of multicultural education. In J. A. Banks & C. A. Banks (Eds.), *Handbook of research on multicultural education* (pp. 81–94). Jossey-Bass.

84 Ladson-Billings. (1995). *But that's just good teaching!*, 159–165.

85 Griner, A. C., & Stewart, M. L. (2012). Addressing the achievement gap and disproportionality through the use of culturally responsive teaching practices. *Urban Education, 48*(4), 585–621.

implementation that did not always align with instructors' perceptions of their own practices, though this contrast may reflect constraints due to remote learning caused by the pandemic, such as difficulty in assigning group project work or building relationships in virtual, sometimes asynchronous, courses. It is also possible that instructors used OEP intermittently, which would make the practices more difficult to observe during a single, 1-hour observation (in the case of live course observations).

Moving Towards Transformative Instructional Change

What might be required for deeper changes in course design to occur, and what changes in course activities, practices, materials, and interactions might be observed upon making these changes? It appears that changes to materials and assignments can be important initial steps to move towards deeper course transformation.

In their framework of OEP from a social justice perspective, Bali, Cronin, and Jhangiani present a typology of OEP practices that lie along a continuum of social justice.[86] The authors argue that some practices may be ameliorative for students (i.e., addressing surface injustice) if students have some voice and choice, for example, if students create renewable assignments that introduce "previously scarce cultural knowledge…into open spaces" or if students suggest course content.[87] However, these same practices

can become transformative to students (i.e., directly counter systemic injustice students may experience) if students become involved in decision-making around the "how" and "why" of an activity. Creating renewable assignments could become transformative if students from marginalized groups are fully involved in deciding how the assignment will be made. Similarly, selecting course content can be transformative if students from diverse backgrounds not only suggest content but also design and participate in the process of selecting course materials.

In this way, allowing students more meaningful influence and voice in their learning seems to be a crucial differentiator between more surface-level use of OEP and deep transformation of courses and instructional practice. Our interviews and observations suggest that greater institutional support may help instructors to identify and act upon opportunities for implementing such changes in their courses.

Institutional Supports to Facilitate Take-up of OEP and CRE

Institutions are well-positioned to support more intentional implementation of OEP and CRE. First, colleges may promote the use of OER, OEP, and CRE by encouraging and providing supports for the use of OER materials and innovative teaching practices. Colleges in this study have already begun to channel supports for OER through centers of teaching and learning, technology, or online

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86 Bali et al. (2020). *Framing open educational practices from a social justice perspective*, 1–12.

87 Bali et al. (2020). *Framing open educational practices from a social justice perspective*, 5.

education. These offices may be further leveraged to encourage more deliberate take-up and integration of OEP and CRE practices. In the few colleges where we observed direct supports for redesigning courses with OEP such as through fellowships, instructors received resources on how they could redesign their syllabi, assignments, and activities using OER, going beyond merely swapping out traditional materials for OER and instead, thinking about ways that they could center student voice and learning more explicitly. While such fellowships typically fund only a small number of faculty within a college in a given year, expanding these and similar programs could be another avenue to broaden instructional transformation. Institutions may also bolster efforts to foster collaboration between faculty, such as creating hubs for instructors to share and search for ideas of OEP materials and activities or helping instructors navigate the process of publishing OER materials.

Finally, administrator support of OER and OEP could go a long way: instructors reported that administrator approval signals support for the use of new materials or strategies in courses and aids initiatives to become a top priority in the institution. Administrators could also help create incentives and institutional systems that are supportive of instructors' OER and OEP usages, such as by including faculty members' efforts in using or promoting OER and OEP in tenure or promotional decisions. While administrators were generally supportive of broader institutional efforts to address issues of social justice, make courses accessible and relevant, and improve instructional practices, some appeared reluctant to advocate specific changes in instructional pedagogy and focused more on encouragement and support to use OER materials.

The Framework for Enacting Open and Culturally Responsive Practices describes a level of instructional change that is rigorous and requires concerted encouragement and support by institutions or other initiatives.

VIII. Conclusion and Looking Ahead

This study sheds light on some important ways in which the affordances of OER have allowed instructors to incorporate significant changes to their instructional approaches and philosophies. In particular, moving away from published textbooks and curriculum materials enabled some instructors to "slow down" their pacing, emphasize deeper exploration of topics, and create space for student voices and agency. Data from this study suggest that the use of OER materials enabled instructors to shift their instruction towards using a more open, student-centered approach by increasing instructors' selection and curation of materials to meet student needs. Through this study, we were able to develop a framework for open and culturally responsive practices and observe instances of how instructors implemented these practices in different parts of their courses.

However, evidence from the study suggests that such practices are far from prevalent, even amongst colleges with relatively mature OER programs. Variation in implementation approaches and a lack of institutional supports and resources for OEP beyond the use of OER suggests that adoption of open and culturally responsive teaching practices in community colleges is emergent. A variety of contextual factors constrain broader transformation, including a lack of explicit encouragement of these practices from administrators (many of whom are not familiar with OEP themselves), supports and resources that focus mainly on instructional materials, and concerns about not providing students with adequate coverage of the required skills and knowledge

for advancement in their fields or degrees. Aside from a few instances, most colleges in our study did not have policies and practices in place to sustain or expand the use of these practices.

Overall, this study provided evidence that adoption of OER can lead to changes in instructional practice, but how practices are implemented across courses depends on the individual instructor, the type of course, and the amount of freedom instructors feel they have over course objectives.

This study raises several questions for future research. Reaching an understanding of how the application of open and culturally responsive practices impacts students' learning experiences and outcomes requires further investigation with a number of conditions in place. First, practices must be implemented with enough consistency across multiple courses to enable researchers to identify the specific factors or components that led to changes in outcomes. This condition might be achieved through the provision of professional development that encompasses instructional transformation with OER, going beyond typical training programs that primarily focus on material licensing and content discovery, vetting, and curation. Second, future research would be substantially enhanced by in-person instruction and data collection to gain deeper insight into a full range of potential OEP and how they impact student experiences, learning, and academic outcomes.

Appendices

Appendix A: Detailed Description of Research Methods

Grounding in Literature

To develop a theoretical foundation for our understanding of OEP and culturally responsive education and the intersections between these bodies of thought, we reviewed approximately 40 articles on OER, OEP, and culturally responsive education. Articles were selected by searching education journal databases using relevant keywords. Studies were included if a primary focus was on OEP, OEP in connection to CRE, or connecting OER to CRE or OEP, or if the study focused on how institutions implement OER or OEP. Approximately 40% of studies were empirical, 35% theoretical frameworks, and about 25% were reviews of literature. We then synthesized themes from this literature into an internal memo that guided our subsequent primary research and development of a framework for open and culturally responsive courses.

Interviews with OER/OEP Experts and Practitioners

We supplemented this literature review with 13 interviews of scholarly experts and OEP practitioners from community college and minority serving institutions (MSIs), conducted in the winter of 2021. An important goal of this data collection was to explore how conceptualizations of OEP and its connection to CRE might vary for practitioners in a different context, particularly community colleges. Our findings from the literature review informed the questions that we posed to practitioners and scholarly experts during the interview process. We asked them to share their insights on the following elements of OER and OEP:

- How they would define open educational practice and describe its relationship to OER,

- What evidence of OEP implementation they would look for when observing someone's classroom,

- Tensions that instructors face when using OER and/or implementing OEP,

- How OER enables culturally responsive education; in what ways OEP overlaps with CRE,

- The extent to which instructors who use OER and OEP are engaged in CRE, and

- Any tensions between implementing OEP and CRE.

We differentiated the interview protocol slightly based on the role of the interviewee. Specifically, we asked experts about how they and others conceptualize OEP and CRE, especially in relation to OER usage, their perceptions of how OEP are implemented in practice, the ways in which

they believe institutions—and especially, community colleges—may play a role in facilitating or inhibiting the use of OEP.

Sampling Procedures and Criteria

In the winter of 2021, we asked institutions interested in engaging with this research project to complete a questionnaire to assess the degree to which college faculty had used OER materials and implemented innovative instructional practices, as well as how OER and OEP fit with institutional strategies, goals, and initiatives. The purpose was to recruit a purposive sample of institutions with multiple faculty members using innovative practices enabled by OER and supported by institutional policies and supports. In other words, we aimed to identify and document the practices of pioneering institutions and faculty, as opposed to a representative sample of OER users. The questionnaire is included in Appendix B. In keeping with ATD's and the research team's interest in OER and OEP as institutional endeavors, we encouraged responses representing institutions, as opposed to individual faculty members.

The questionnaire was circulated to the ATD network, as well as selected Historically Black Colleges and Universities (HBCUs) that had experience with OER and to a liaison for Tribal colleges. Members of the SRI research team and the project lead at ATD selected institutions to participate based on whether the institution had a robust OER program as well as a commitment to and moderate to significant use of OEP and/or efforts to support instructional transformation. Ultimately, 40 institutions completed the questionnaire. Each entry was rated separately by members of the research team and the project lead at ATD.

Scores were then compared and discussed. Many applicants were screened out because they did not demonstrate that they understood the distinction between OER and OEP, or because OEP practices appeared to have limited uptake. We had sought to include HBCUs and tribal colleges in the sample but were unable to identify ones with mature OER programs that had the capacity or interest to participate. Ultimately eight community colleges were selected to participate in the study. Each site identified a point of contact (typically the OER program coordinator) to help coordinate the data collection activities conducted during virtual site visits described below.

Participating colleges were offered a stipend of $5,000 each to support time for a project liaison and travel to a cross-institutional workshop. In addition, instructors and students who participated in interviews received gift cards.[88]

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88 Faculty members received $40 gift cards. Initially we offered students $25 gift cards to participate in focus groups but raised this offer to $40 due to low response rates.

Virtual Site Visits

The SRI research team conducted virtual site visits at each college during the spring and summer of 2021. For each site visit, we aimed to conduct interviews with 3–5 instructors, 1–2 administrators and staff with involvement in the OER program, 1–2 focus groups with 3–5 students each, and course observations for a subset of instructors interviewed. In some cases, these targets were relaxed due to recruitment challenges, especially the difficulty of attracting students.

Interviews with college faculty and instructors

We created semi-structured protocols for interviews with faculty members and practitioners using OER and OEP. During the spring and summer of 2021, we interviewed 50 faculty members across eight participating institutions. We asked each site's point of contact to identify instructors who use OER materials and open education practices for these interviews, as well as institutional leaders or administrators who were familiar with and/or directly supported the OER program. We sought to identify how college faculty conceptualized OER; changes to instructional pedagogy resulting from the use of OER; the extent to which OER and OEP factored into the institution's vision and goals, and institutional supports and resources available to practitioners to transform their instruction through OER.

Student focus groups

As part of the site visits that we conducted in the spring and summer of 2021, we facilitated 9 focus groups with 14 students at seven colleges. Based on our interviews, we asked select instructors to contact their students to request their voluntary participation in a focus group. These interviews asked students to share their perceptions of and experiences in OER courses, specifically focusing on their engagement, sense of belonging, and academic success. Focus group facilitators asked students to compare their experiences with other courses that use traditional, non-OER course materials. Due to low response rates (even after increasing the incentive), most focus groups became individual interviews.

Course Observations

In addition to conducting interviews with faculty and student focus groups, we completed 21 course observations during the spring and summer site visits. The goal of course observations was to gain insights into 1) the extent to which instructors implemented instructional practices aligned with our understanding of OEP and CRE, 2) what these instructional strategies looked like in practice, and 3) how the use of OER enables these practices.

We referred to several observation frameworks to create the protocol that we used in conducting course observations. These included the Culturally Responsive Instruction Observation Protocol (CRIOP),[89,90] the Teaching for Robust Understanding (TRU) framework,[91] the Classroom Observation Protocol for Undergraduate STEM (COPUS),[92] and the Interactive, Constructive, Active, and Passive (ICAP) framework.[93] While these frameworks were not designed around open pedagogy, there was significant overlap in the kinds of student-centered practices they sought to identify and OEP. We used these protocols, in addition to findings from the literature review and fall interviews, to get ideas about specific practices to look for during course observations.

Given the prevalence of asynchronous, online courses during COVID-19, it was necessary to develop course observation procedures that worked in three different modalities: in-person, online synchronous, and online asynchronous. Thus, we also drew from a prior study of online learning to develop our approach to online class observations.[94] Virtual class observations raised unfamiliar considerations for some instructors and institutional research officers; for example, some were concerned that we would have access to personal information such as names and discussion board posts for students who had not consented to participate in the study. The research team worked with each college to adapt procedures and privacy protections for their needs. In some cases, this meant that we could only take notes on our observations, whereas other colleges allowed screenshots of synchronous class sessions. One instructor was willing to take the SRI researcher on a virtual tour of their online course but not to provide direct access.

During in-person and synchronous observations of class sessions, we recorded a narrative of class activities at approximately 5-minute intervals, including both teacher and student statements, actions, and behaviors. At the end of the observation, we used a rubric aligned to the OEP/CRE framework to summarize the presence of OEP and CRE by assessing the extent to which there was evidence of each of the five indicators in the course. We also reflected on if and how evidence of OEP and CRE related to the course's adoption of OER materials.

89 Powell, R. and Rightmyer, E. C. (2011). *Literacy for All Students: An Instructional Framework for Closing the Gap*. Routledge.

90 Powell, R., Cantrell, S. C., Malo-Juvera, V., & Correll, P. (2016). Operationalizing Culturally Responsive Instruction: Preliminary Findings of CRIOP Research. *Teachers College Record, 118*, 1-46.

91 Schoenfeld, A. H., & the Teaching for Robust Understanding Project. (2016). *An Introduction to the Teaching for Robust Understanding (TRU) Framework*. Berkeley, CA: Graduate School of Education. Retrieved from http://truframework.org or http://map.mathshell.org/trumath.php.

92 Smith, M., Jones, F., Gilbert, S., & Wieman, C. (2013). The Classroom Observation Protocol for Undergraduate STEM (COPUS): a New Instrument to Characterize University STEM Classroom Practices. *CBE-Life Sciences Education, 12*(4), 618-627. https://doi.org/10.1187/cbe.13-08-0154

93 Chi, M. T. H. & Wylie, R. (2014). The ICAP Framework: Linking Cognitive Engagement to Active Learning Outcomes. *Educational Psychologist, 49*(4), 219-243. https://doi.org/10.1080/00461520.2014.965823

94 Jaggars, S. S., & Xu, D. (2016). How do online course design features influence student performance? *Computers & Education*, 95, 270–284. https://doi.org/10.1016/j.compedu.2016.01.014

Analysis

Interviews were conducted via Zoom and recorded and transcribed (except for one instructor interview, for which we did not have permission to record). Prior to analyzing instructor, faculty, and student responses from interviews and focus groups, we developed a priori codes based on our analysis of fall interviews with scholars and practitioners, literature on OER, OEP, and CRE, the study research questions, the spring interview protocol, and the final report's tentative outline. These codes informed the framework we used to collect information on:

- Instructor and administrator understanding of and goals around OER, OEP, and CRE, including how these concepts are intertwined,

- Classroom practices, including course features like materials and assignments/assessments, as well as aspects of culturally responsive education and OEP,

- Institutional context, such as institutional goals and networks of support for OER and OEP, and

- Student experiences in classes that use OER, OEP, and CRE, including students' perceptions of these classes and how engaged they are.

The final coding framework is included in Appendix C.

The research team coded four common transcripts to check for interrater reliability and then adjusted the coding schema. Once coded, interview data were organized and analyzed by code and subcode. Classroom observation data collected for the five OEP practices (student agency & ownership, inclusive content, generating new knowledge, critical consciousness, and classroom culture) were included with the interview data for those codes, respectively, and analyzed together. Codes were then grouped into the four original research questions. For each question, researchers summarized interview and classroom observation findings, identifying key quotes associated with these overarching ideas, and identifying themes. We used these summaries to create 20 individual memos that either corresponded with a single code or group of related codes within the framework.

The research team collectively reviewed and discussed the implications of findings for the memos. Each discussion focused on a single research question and identified key takeaways from relevant memos that would help to answer the corresponding research question.

Appendix B: Site Recruitment Questionnaire

Achieving the Dream (ATD), with support from the Hewlett Foundation, has retained SRI International to conduct research on teaching and learning with open educational resources (OER) in community colleges, including minority-serving institutions (MSIs). If you are interested in having your college participate in the study, please submit this questionnaire by February 5, 2021. **Please note that partially completed questionnaires cannot be saved.**

If you have questions, contact:

- Dr. Rebecca Griffiths, Principal Investigator, SRI International: rebecca.griffiths@sri.com
- Dr. Richard Sebastian, Director, Open & Digital Learning, Achieving the Dream: rsebastian@achievingthedream.org

1. What is your full name?

2. What is your position(s) at your institution?

3. What is your email address?

4. Are you interested in participating in the OER Teaching & Learning study? [skip logic]

    a. If yes, 6

    b. If no, 5

5. Thank you for letting us know. Can you briefly share why you are not interested? [exit survey]

6. Briefly describe your institution's OER efforts. When did they begin? What is the approximate scale (e.g., in terms of number of OER course sections offered or instructors involved)? Is there anything important we should know about the OER program at your institution?

7. Is transformation of teaching and learning an important goal for your institution's OER program?

    a. Yes

    b. No

    c. Not sure

8. [If yes] Please describe your institution's teaching and learning goals for the OER program.

9. Do you know of instructors who use open educational practices or open pedagogy in their teaching?

    a. Yes (go to 10)

    b. No (go to 11)

    c. Not sure (go to 11)

10. Approximately how many instructors use these practices?

11. Briefly describe your institution's supports for OER:

    a. What kinds of training/professional development does your institution offer for teaching with OER?

    b. What kinds of supports does your institution provide instructors to help them convert their courses to include use of OER and/or open educational practices?

    c. Do these supports make any explicit connections between OER, open education practices, and culturally responsive teaching and/or pursuit of racial equity?

12. Please describe your college's plans for offering in-person versus remote courses in spring 2021 and summer 2021 (if known).

    a. Will your college offer any in-person or hybrid courses during this time frame?

    b. If yes, would your college be open to hosting site visitors?

Appendix C: Coding Framework

Parent Code	Child Code	Grandchild Code (if applicable)	Definition
Understanding and goals around OER, OEP, and CRE			How individual participants understand OER, OEP, and CRE, and how they understand any connection across these concepts.
	OER understanding/ goals	-	How participants conceptualize OER, how to use OER, and/or their goals around using OER in their practice.
	OEP understanding and goals	-	How participants conceptualize OEP, how to use OEP, and/or their goals around using OEP in their practice.
	OEP's connection to OER (conceptual)	-	Extent to which participants see a connection between OEP and OER (explicit and implicit connections).
	CRE/equity connection to OEP/ OER (conceptual)	-	Extent to which participants see a connection between OEP/OER and culturally responsive education (CRE), social justice, or equity-focused instructional practices. Can include how participants define CRE.
Classroom Practices			Instructors' instructional practices, the extent to which instructors' OEP, OER and CRE practices are connected, and instructor-level barriers to using OEP.
	Course features	-	Type of course feature: course design, materials, practices, assignments & assessments, and classroom interactions.
		Course design	Course feature related to course design (e.g., course vision, planning, structure, grading policies).
		Materials	Course feature related to course materials (e.g., texts, PPTs, and other materials).
		Practices	Course feature related to instructional practices (e.g., questioning strategies, lesson structure, how instructors use class time).
		Assignments & assessments	Course feature related to course assignments and assessments (e.g., homework, assignments, class activities, assessments.)
		Interactions	Course feature related to interpersonal interactions (e.g., how instructors and students interact) both online (discussion boards) and in person.
	Aspect of CRE/OEP		Extent to which course features relate to aspects of CRE and/or OEP.
		Student agency & ownership	Course allows for student agency or ownership (e.g., student has voice, choice, or leadership over learning).
		Inclusive content	Course contains inclusive content (e.g., brings in diverse perspectives, tailors to students' backgrounds, needs or interests).
		New knowledge	Course allows opportunities for students to generate new knowledge (students may apply or develop new theory, contribute to renewable or generative assignments).
		Critical Conscious	Course aims to develop students' critical consciousness and/or emancipation (e.g., real world assignments, decolonized curriculum).

Parent Code	Child Code	Grandchild Code (if applicable)	Definition
		Classroom culture	Course has strong culture or relationships (e.g., safer space, ethics of care, respect between students and instructor, inclusive environment).
		Non-OEP or non-CRE	Course feature does not contain evidence of OEP or CRE.
	OER connected to OEP/CRE (practice)	-	Extent to which participants' implementation of OEP or CRE is related to use of OER.
	OER/OEP barriers (non-institutional)	-	Barriers to OEP that are outside of the institution, such as the quality/availability of OER materials.
Institutional Context			Features of institutional context that support or hinder instructors' adoption of OER, OEP or CRE practices, including collaboration, institutional goals/vision, institutional supports, institutional barriers, and remote learning.
	Collaboration/ network of supports for OER/OEP		Extent to which instructors or administrators collaborate with other instructors on developing shared OER/OEP practices (e.g., designing a course), working in a community of practice/ network on OER/OEP (e.g., asking for help on OER design).
	Institutional goals and vision around OER, OEP, or CRE	-	Institution's goals and vision for OER, OEP, and CRE, and how goals/vision connect with OER/ OEP/CRE work at the institution (e.g., alignment with institutional goals/vision, leadership support for the work)
	Institutional supports for OER, OEP, or CRE		How institutional policies, practices, or resources support implementation of OER, OEP, or CRE (e.g. time, money, support personnel, trainings, culture).
	Institutional barriers to implementing OER, OEP, or CRE	-	How institutional policies, practices, or resources (or lack thereof) present challenges to implementation of OER, OEP, or CRE. (e.g., time, money, lack of trainings, lack of supportive culture).
	Online/remote learning	-	Ways in which remote/online facilitated or hindered use of OER, OEP, or CRE.
Student Experience in OER/OEP/CRE Classes			Students' perceptions of courses using OER, OER, or CRE, students' performance or sense of belonging in these classes, and how performance or belonging connects to instructors' use of OER, OEP, or CRE. Experience could be described by instructor or the students themselves.
	Academic performance	-	Students' academic performance (e.g., grades, work completion, work quality) in classes that use OER, OEP, or CRE classes, and/or how performance connects to instructors' use of OER, OEP, or CRE.
	Engagement, agency, & belonging	-	Extent to which students felt belonging, agency, engagement, motivation, attendance etc. in classes that use OER, OEP, or CRE, and/or how this connects to instructors' use of OER, OEP, or CRE.
	Perceptions of OER/ OEP classes	-	Students' perceptions of classes that use OER, OEP, CRE and/or how they compare to other classes (e.g., relevant content, class activities, utility of class for future). May include students' perceptions that OER/OEP is lacking in the class.

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