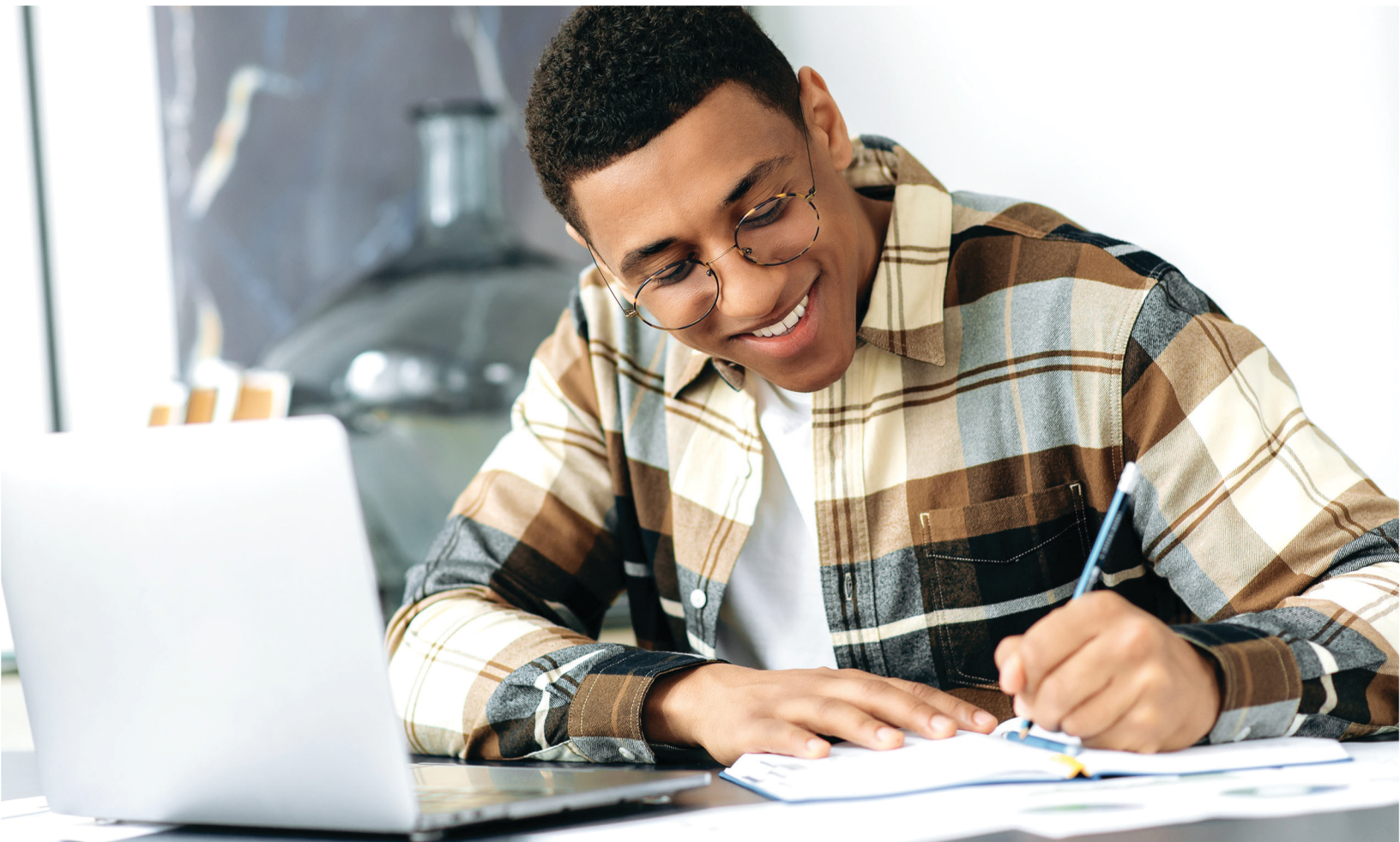




COLORADO RISES:

Transforming Education Practices

through Open Educational Resources



2022

The Colorado Department of Higher Education
Report to the Colorado Commission on Higher Education,
Joint Budget Committee and Education Committee of the
General Assembly of Colorado

Statute: CRS 23-1-135



**Prepared and submitted by
the Colorado Department of Higher Education with the OER Council
under the Executive Leadership of Dr. Angie Paccione
Pursuant to the statutory authority of §23.-4.5-103**

November 2022

1600 Broadway, Suite 2200, Denver, CO 80202

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Colorado Rises: Transforming Educational Practices through Open Educational Resources
COLORADO DEPARTMENT OF HIGHER EDUCATION



1600 Broadway, Suite 2200
Denver, CO 80202

Jared Polis
Governor

Dr. Angie Paccione
Executive Director

Dear Members of the Colorado General Assembly and the Colorado Commission on Higher Education:

It is with great pleasure that we submit the 2022 Open Educational Resources Report – Transforming Educational Practices through Open Educational Resources — pursuant to CRS 23-1-135.

Data continues to suggest earning a postsecondary credential improves an individual's earning potential and offers a robust return on investment. While the cost of college or technical school remains a barrier for many, containing costs for students in higher education is a significant priority for both the Colorado Department of Higher Education and the State of Colorado. To that extent, the Department and OER Council champion OER as a strategic means of meeting the demand for low-cost, high-quality learning and teaching materials for Colorado students.

Since 2018, the concerted effort has resulted in growth and expanded expertise in the Open Education field, as well as cost savings to students throughout Colorado. Thus far, OER has resulted in more than **\$20.5 million in cost savings for students**. This figure represents an **astounding eightfold return on the state's investment** in OER and is clear evidence of the dedicated efforts of the higher education institutions' faculty and staff. This far exceeds our goal of a 3x return on the state's investment.

OER not only saves students money but offers opportunities for inclusive approaches to curriculum and course design, setting the stage for improving student success while making a clear case for OER in the pursuit of equity. To date, nearly 1,000 courses have been developed by OER grantees, reaching more than 124,000 students who have enrolled in courses utilizing OER over a three-year period.

As the rapidly evolving needs of students, staff, and faculty continue to unfold after the pandemic, Open Education and OER remain a strategic priority for making higher education more affordable and promoting innovation and equity in higher education in Colorado.

Signed,

A handwritten signature in black ink that reads 'Dr. Angie Paccione'.

Angie Paccione
Executive Director
Colorado Department of Higher Education



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Executive Summary

Open Educational Resources, free and openly licensed learning materials, make education more affordable for students and enable innovation in classrooms. With the 2021-2022 grant cycle, Colorado students have now saved more than \$20.5 million from a \$2.425 million investment from the State. The COVID-19 pandemic continued to be a defining backdrop to the OER grant program in year three. Moving courses online propelled interest in adopting OER and the pandemic was a motivating factor for many faculty. However, many grantees discussed COVID fatigue and staff turnover as reasons for slower progress and multiple institutions noted lower enrollments impacting their data in final reports.

Though the role of Open Education and OER has been a priority for the Colorado Department of Higher Education (CDHE) since 2018, the proliferation of OER during the time of online learning was accentuated; proving an invaluable strategy for providing more affordable, high-quality, accessible, and equitable learning materials as well as approaches to instruction. With respected entities such as UNESCO calling for the expanded use of open education to help maintain access for students learning remotely¹, Colorado stands proud as a champion of open education and OER as key components to best serve students and educators under these circumstances. OER are a key step in the Department's Roadmap to Containing College Costs and Making College Affordable².

Colorado is a national leader in educational attainment, ranking 2nd for bachelor's degrees and 7th for advanced degrees amongst all states³. Despite this, Colorado is the 19th most expensive state to obtain a degree from a public institution⁴. OER offers Colorado a means to help improve affordability and continue to support high educational attainment and talent development. Thanks to the support of the legislature and professionals dedicated to making education more readily accessible, Colorado is fast becoming a leader in OER development, and the high quality resources produced and adapted through this program are sure to enhance affordability and accessibility of education in Colorado and beyond.

Containing costs for students in higher education remains important to CDHE and the State of Colorado. Although data suggest that earning a postsecondary credential improves individual earning potential and offers robust return on investment⁵, the cost of college or technical school remains a barrier for many

¹ UNESCO-290 million students out of school due to COVID-19:

<https://en.unesco.org/news/290-million-students-out-school-due-covid-19-unesco-releases-first-global-numbers-and-mobilizes>

² CDHE Roadmap to Containing College Costs:

<https://higher.ed.colorado.gov/Publications/Reports/Roadmap-to-Containing-College-Costs-and-Making-College-Affordable.pdf>

³ US Census Bureau: <https://data.census.gov/cedsci/table?q=educational%20attainment&tid=ACST1Y2019.S1501>

⁴ National Center For Education Statistics: https://nces.ed.gov/programs/digest/d19/tables/dt19_330.20.asp

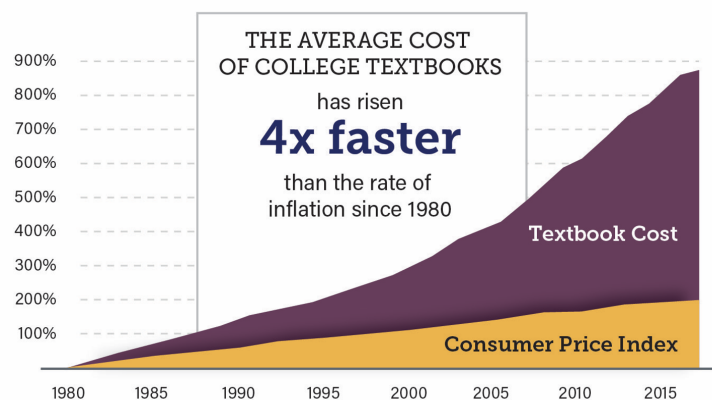
⁵ CDHE Annual Return on Investment Report: https://higher.ed.colorado.gov/Publications/Reports/Legislative/ROI/202008_ROI.pdf

Coloradans. In fact, tuition is up more than 60% in Colorado, and several other states, since 2008⁶. To this end, CDHE is building capacity for wide-scale implementation of OER, which, according to state definition, are resources which permit free use and repurposing by others. Pursuing this cost containment strategy was borne out of H.B. 18-1331, a bill that created a statewide OER Council and grant program that was informed by a 2017 CDHE report, and expanded in 2021 with S.B. 21-215.

What's clear is OER saves students money, but this investment matters beyond the financial benefit. OER and open education practices help educators redesign approaches to teaching through innovative methods, ultimately supporting the transformation of education for the future of learning. The work inspired by the OER legislation is important to educators and Coloradans everywhere.

As emphasized in Figure 1, over the last half century, textbook and higher education prices have increased at an unparalleled rate compared to all consumer goods, contributing to the rising cost of college overall. In the last decade, the average cost of college textbooks has risen four times faster than the rate of inflation⁷. National organizations, the state of Colorado and Colorado institutions of higher education estimated that college students should have budgeted between \$1,000 to \$1,800 for books, supplies, and course materials for the 2021-22 academic year⁸.

FIGURE 1: Consumer Price Index based on Bureau of Labor Statistics data



Since 2018, CDHE has been working to assist public higher education institutions in lowering learning material costs by developing and expanding the use of OER in tandem with the Colorado OER Council, pursuant to H.B. 18-1331. Moreover, the Department's support for open educational practices aims to continue to address access and equity issues in Colorado's higher education system.

In the first year of the OER Grant Program, institutional grantees reported savings of more than \$3.9 million to the students of Colorado at their respective institutions, \$2.4 million in the second year of

⁶ Center on Budget and Policy Priorities- *State Higher Education Funding Cuts Have Pushed Costs to Students, Worsened Inequality*: <https://www.cbpp.org/research/state-budget-and-tax/state-higher-education-funding-cuts-have-pushed-costs-to-students>

⁷ US PIRG Open 101 Report: <https://uspirg.org/news/usp/release-new-report-open-101>

⁸ College Board: Average Estimated Undergraduate Budgets 2022:

<https://research.collegeboard.org/media/pdf/trends-in-college-pricing-student-aid-2022.pdf>. State Student Budget Parameters 2018-19:

<https://highered.colorado.gov/Finance/FinancialAid/Policy/2018-19-Student-Budget-Parameters.pdf>. Campus websites such as

<https://www.csupueblo.edu/student-financial-services/cost-of-attendance.html> and <https://finaid.mines.edu/Cost-of-Attendance-Undergraduate/>.

the grant, and \$3.6 million in year three. Moreover, these savings are calculated by institutions of higher education over the course of one academic year, meaning students in Colorado might continue to save this amount with continued use of OER year-over-year. As a direct result of the first three cycles of this program, the total estimated savings are believed to be near \$10 million in the last year and more than \$20.5 million total⁹; numbers which are only expected to grow as this program continues. The potential for OER in Colorado is outstanding. This \$20.5 million figure continues to represent more than a eight fold return on the State's investment into this initiative¹⁰.

Key Findings

Over the last four years, CDHE and the OER Council have established a community of learning, practice, and innovation for educators exploring open education. Key findings suggest a meaningful current impact and promising future. Most significantly the below findings demonstrate the impact and potential of open education and OER in Colorado:

Current performance measures indicate a striking return on the State's initial investment. In addition to an estimated \$20.5 million in student savings from \$2.425 million in grant funding¹¹—over an eight fold return on investment—awareness and enthusiasm have increased through capacity-building.

Key Performance Indicators:

- Statewide, a total of \$3.9 million in student savings occurred during the initial implementation of the first grant cycle with an additional \$2.4 million in student savings occurred during the second grant cycle. In the third grant cycle, \$3.6 million in student savings was reported. Assuming OER from the first and second cycles continue to be used with similar enrollments, those numbers are believed to have compounded year-over-year. It is estimated that more than \$20.5 million in total student savings have resulted from the program over the three reported years.
- Grantees addressed more than 100 courses in the first year through OER creation or adoption, and more than 300 courses in the second year of the grant program. This growth trend continued with 421 courses being addressed in the third year,

⁹ \$10 million and \$20.5 million figures assume the majority of OER from year one and year two course OER continue to be used with similar enrollment to that which was reported in 2020 and 2021. Reporting savings from continued use was not required in the reporting template but is assumed based on OER growth as a percentile of institutional course offerings.

¹⁰ The total allocation for grant monies in the first and second years of the OER grant program were nearly \$2,500,000 and are further detailed in the budget and institutional profile sections of this report.

¹¹ Total amount of estimated cost-savings for students is an aggregated total tallied from the final reports of grantees from cohorts one and two and include the summer 2019 through spring 2021 terms. Data regarding continued use was not collected, but is assumed based on reports of growth in OER across institutions.

and more than 64,000 students¹² reached in courses with OER materials funded by the grant program's third cycle.

2

National trends and local data suggest OER supports student learning outcomes while lowering costs for students. The majority of students and faculty who have used both OER and traditional textbooks believe OER are of equal or higher quality, making it increasingly challenging to justify the high price of commercial textbooks.

Key Performance Indicators: Most OER grantees have reported data demonstrating “improvements” or “no negative impact” to student learning and outcomes as a result of OER implementation with various campuses citing increased student engagement or enthusiasm when open education pedagogies are employed by instructors.

- Survey results indicate increases in awareness and large increases in the amount of OER champions on campuses, more institutions tracking student cost savings, and higher administrative support for OER¹³.

3

Building capacity and funding creates a statewide ecosystem for successful OER adoption. Fortunately in Colorado, both funding and support for OER implementation have been coordinated through the work of the OER Council and CDHE, providing the best opportunity for the broadest impact.

Key Performance Indicators:

- 87% of eligible institutions have received funding from the CDHE OER Grant Program¹⁴ overall, signaling both a great interest in this field, and an effort to build statewide collaboration¹⁵. In the third year of the grant program, only 75% eligible institutions were awarded a grant, but 100% remains the goal. It is believed that COVID affected some institutions applying during the third cycle.
- More than 120 faculty, staff, and advocates have been trained through the Open Education Ambassadors program, with more than 1,250 attendees at the June 2020 OER Virtual Summit. This year this interest continued with more than 300 registrants for the June 2022 OER Conference, and more than 20 Colorado faculty and librarians joining a Colorado cohort for the Creative Commons Certificate.

¹² Cumulative course titles, student impact, and savings as reported by year three grantees in their 2022 final reports.

¹³ Results when compared against 2020 and 2021 grantee surveys.

¹⁴ One community college and 3 Technical Colleges have not applied directly for funding despite belonging to the Colorado Community College System which has received funding in all three cycles. All other eligible institutions have received funding in either the form of a grant or professional development funding in the first three years of the program, either directly or as part of system-wide initiatives.

¹⁵ Note: several system or inter-institutional grant initiatives have been funded in the first two grant cycles. Since the University of Colorado system grant specifies all four University of Colorado campuses, these institutions are included in this data.

COLORADO OER DASHBOARD

Grant Years 1, 2 & 3:

INVESTMENT OF
\$2.425
 MILLION AWARDED

ROI goal

3x

8x

actual return on investment

\$3.6 million
 cost savings to
 students during the
 third grant cycle



421

course titles developed
 by OER grantees

64,000+

students enrolled in
 courses with OER

2021-2022 COHORT 3 GRANTEES

22

Institutional
 grants

5

small group
 grants

26

Colorado
 public
 institutions

75% of eligible institutions awarded a grant in 2021

18

OER council members
 representing 14 institutions
 and 3 state agencies

\$20.5

million estimated student
 savings over three years

300+

registrants for the
 2022 Colorado OER
 Conference

Recommendations

Acknowledging the progress so far, the OER Council recommends the below considerations for continued momentum in 2022. The recommendations below are followed by data points which indicate progress toward the vision of the OER Council and CDHE with regard to Open Education in Colorado higher education.

BUILD STRUCTURE

CDHE and the OER Council must continue statewide leadership. This group serves as the expert advisory stakeholder body and support OER growth and innovative educational practices throughout the state until they become the default at public institutions of higher education in Colorado.

- **Progress:** Through ongoing training sessions, offered both virtually and in-person, CDHE and the OER Council have fostered support through professional development. This includes national and international engagement collaborations¹⁶ providing those in Colorado with additional personal development opportunities.
- **Next Steps:** Maintain and continue building partnerships with national entities such as the Creative Commons and Open Education Network, and elevate the work and knowledge of Colorado OER advocates through a monthly professional development series in order to build sustainable training for long-term support of OER in Colorado.

Institutions must encourage and support campus-level infrastructure and staffing dedicated to the implementation and coordination of OER to propel this work at their respective campuses.

- **Progress:** Several campuses have not only designated OER within the portfolio of a specific staff or faculty member, but many have dedicated resources specifically to support a staff or portion of a staff member to administer OER specific projects¹⁷.
- **Next Steps:** Explore campus-level policies such as inclusion of OER in tenure and promotion criteria while supporting administrative initiatives with campus leadership.

¹⁶ CDHE and OER Council members hold various leadership positions within the Open Education Network, the Open Education Research Group, Creative Commons, the Open Education Conference and Open Education Global.

¹⁷ Known campuses who have dedicated such resources include PPCC, MSU-Denver, and CCCS.

BUILD CULTURE

Intentional efforts to build and foster a strong culture will help sustain open education efforts and prioritize more affordable and innovative education.

- **Progress:** In addition to granting nearly \$3.4 million to institutions for OER initiatives through four grant cycles, the CDHE OER Council has organized more than 20 trainings and workshops for faculty and staff while also adapting a self-paced *Zero Textbook Cost & Equity*¹⁸ professional development course; all freely available to faculty and staff.
- **Next Steps:** Deepen knowledge of OER and Open practices to include vision for equity, access, and affordability, moving beyond cost-savings benefits to include a comprehensive vision of Open Education.

CDHE and the OER Council must continue to foster a statewide community to meet their goals of 100% awareness of OER promoting improved quality of educational materials and encouraging the default exploration of OER in course design.

- **Progress:** Faculty, staff, and administrators are increasingly more aware of OER or open textbooks, with 100% of grantees saying the majority of their colleagues have at least heard of open textbooks. More than 80% of grantees said colleagues at their institutions are “aware,” or “very aware,” of open textbooks and how they are used¹⁹.
- **Next Steps:** Continued, focussed, and intentional efforts to target institutions who have not yet expressed interest in this grant program.

BUILD EVIDENCE

Measuring progress and impacts to student cost-savings, student learning and other dimensions of student success will help quantify and qualify the impact of OER in Colorado education.

- **Progress:** Though current data and reporting is restricted to OER Grantees²⁰, several data points indicate a positive impact on higher education through the work of the OER Grantees; most notably more than \$10 million anticipated savings for more than 60,000 enrolled students in Colorado over the past academic year alone²¹ with an overall estimated savings of more than \$20 million achieved during the life of the OER grant program. This is forecasted to surpass \$45 million in savings by the end of 2023.
- **Next Steps:** Partner locally and nationally to establish a more sophisticated and comprehensive data-collection framework for Open Education in Colorado.

¹⁸ As part of Governor Polis’ ZTC Challenge, see course at: <https://lor.instructure.com/resources/0530de6019704726a00ae6b3947113b0>.

¹⁹ Based on survey results from 2021.

²⁰ OER metrics are not part of any standardized state reporting and are not part of the annual SURDS reporting required of institutions of higher education in Colorado. For this reason, the Department can only require OER-specific reporting from grantees.

²¹ \$10 million savings and 50,000 enrollment statistics assume first and second year OER are still in use with similar enrollment to prior year reports.

Assessing how and why OER are being used will help inform the agenda of both this initiative and the CDHE to meet the goals of supporting all learners in all parts of the state.

- **Progress:** Survey results from the OER Grantees indicate gains in several areas, including awareness and support from institutional administration.
- **Next Steps:** Expand surveys to include further perspectives on OER in Colorado and administer focus-group level data collection in order to assess quality of experiences for individuals in classrooms around the state.

In addition to the OER Council and institutional recommendations, the 2022 Grantee Reports and Survey indicate further recommendations for CDHE to pursue in moving the Open Education initiative forward for the State of Colorado. These include further support for institutions in the creation and adoption of OER, identifying and differentiating OER and other low-cost or Zero Textbook Cost initiatives, and better facilitation of cross institutional collaboration.

Why OER?

Containing Costs

The wide-scale implementation of OER saves students money by helping contain costs, expand access, and improve equity. While financing postsecondary education continues to be a barrier for many, research suggests earning a postsecondary credential is still the most viable path for improving an individual's earning potential²². Thus, containing costs is essential to expanding opportunities and addressing the needs of Coloradans.

Access to and Equity in Educational Resources

OER has been cited as a catalyst of lifelong and continuous learning, as well as a tool to increase access, equity, equality, and inclusiveness in learning materials and classroom practices²³. Because OER have the potential to expand the access to lifelong learning opportunities and establish frameworks that promote social justice, collaboration and intentional partnerships, open

"Greater availability of OERs will help increase my learning with no stress. Having OERs takes away the necessity of tons and tons of money for books you only end up using for about a semester. It simply provides accurate and helpful information in order to teach students the same things they would learn if they paid 100 dollars for a textbook."

- METROPOLITAN STATE UNIVERSITY
OF DENVER STUDENT

²² "Colorado Department of Higher Education's Annual Return on Investment Report":
https://highered.colorado.gov/Publications/Reports/Legislative/ROI/201907_ROI.pdf

²³ OER and OEP for Access, Equity, Equality, Quality, Inclusiveness, and Empowering Lifelong Learning:
<https://www.ijoe.org/oer-and-oep-for-access-equity-equality-quality-inclusiveness-and-empowering-lifelong-learning/>

education can be used as a strategy to achieve higher quality and relevance of learning materials in education. Clearly, OER and open education practices offer exciting opportunities for improving equity within course materials, providing an incentive for pursuing these measures that goes beyond the cost savings for students. CDHE has recognized this value through several projects, initiatives and actions taken by faculty around the state, in which open education is leveraged to further equity and representation in the course materials.

Case Study: Open Roadrunners - Metropolitan State University of Denver²⁴

Metropolitan State University of Denver has saved students of \$1 million in OER.

Over three years of grants, Metropolitan State University of Denver has prioritized high impact adoption of OER in general studies courses. In the past year, 8,652 students were enrolled in grant-funded OER courses that meet at least one general studies requirement. As a result, 80.7% of all students at Metropolitan State University have experienced a grant-funded OER course in the prior year.

Metropolitan State University of Denver performed a detailed analysis of no- and low-cost material sections by general studies category in fall 2021. The table below illustrates trends in enrollment in general studies courses with materials that are full cost, low-cost, and no-cost. Students surveyed in a no-cost, OER first semester general chemistry course reported being overwhelmingly satisfied with the course (74% extremely satisfied, 18% somewhat satisfied) and 76% reported greater availability of OER courses would have benefits to them, including decreased financial stress, more money available for tuition, and an ability to enroll in more courses. It is anticipated to see enrollment in no-cost material courses to grow in the coming years due to the development by Metropolitan State University's Open Roadrunners funded by the OER grant program.

Students in Sp21 & F21	%_Full_Cost	%_Low_Cost_Materials	%_No_Cost_Materials	General Studies Category
3791	20.60%	2.20%	77.20%	Oral Communication
9701	70.80%	6.90%	22.40%	Natural & Physical Sciences
3859	68.00%	11.90%	20.10%	Written Communication
9835	88.40%	5.40%	6.20%	Social & Behavioral
6064	85.30%	9.90%	4.80%	Arts & Humanities
3438	95.80%	3.10%	1.00%	History
2871	83.10%	16.30%	0.60%	Quantitative Reasoning

FIGURE 2: Table from spring 2021 and fall 2021 General Studies courses at MSU Denver by Materials Cost

²⁴ This case study was derived from Metro State University of Denver's narrative reporting and the supplemental documentation they provided.

Spanish Program OERs developed through the OER grant program by Metro State University Denver instructors are also being utilized by cooperating high schools participating in the concurrent enrollment program. Averaging 150 students per academic year, these materials should save approximately \$13,500 for Denver Public Schools and \$10,000 for MSU Denver university students every year moving forward.

Student Experiences

Metropolitan State University of Denver estimates that from three years of grant support, their students have experienced \$896,620 in student savings with an additional \$200,060 in savings from OER implemented without direct grant support, for a total of \$1,096,680 in savings from OER.

When surveyed, students shared the following about how OER impacts their learning and choice of courses:

"Being able to have the access to the resources I need to success without having to worry about the cost or if it will come in time at the beginning of the semester."

"Not having to pay for textbooks would be very beneficial to me. Sometimes textbooks can cost as much as half a month's of rent and being able to save that much would help my financial situation significantly."

"I would be able to focus more on school, because I would not have to spend as much money which means I would not be required to work as often."

"It would make going to school easier and cheaper. It would make me less worried about the materials needed in order to take a class, and me more focused on the class I am taking."

Faculty Engagement at MSU Denver

Dr. Emily Ragan led four Open Education Network style trainings at Metropolitan State University in fall 2021 and spring 2022. The goals of these workshops were to expose faculty to the affordability crisis in higher education and introduce the Open Education Network as a place to explore openly

licensed textbooks available for use in courses. Twenty-one faculty attended a workshop during this funding period and eight wrote a public review for a book in the Open Education Network library. Additionally, Dr. Ragan developed an OER-themed faculty learning communities (FLCs). The fall 2021 faculty learning community had 11 participants and there were nine participants in the general spring 2022 OER FLC.

Case Study: AA & AS to Z Degree - Community College of Denver²⁵

“By focusing on providing a zero cost option for each requirement of our AA and AS degrees, we can create a pathway for students to earn their degree at zero additional textbook cost.”

OER development is a critical component of Community College of Denver’s 2025 strategic plan to target access, success, and equity. As of 2022, Community College of Denver has 80 unduplicated OER or no textbook courses. In one year, the institution includes its OER and no textbook courses from 4% of the overall course offerings to 16%. Currently 13,936 students at Community College of Denver benefit from OER each school year. The estimated cost savings at Community College of Denver in three years is more than \$1.5 million.

Community College of Denver is pursuing associate of arts and associate of science Z-degrees that will require no textbooks costs to complete. At the conclusion of year three of the OER grant, Community College of Denver is one literature course away from offering a full associate of arts Z-degree. During year three, Community College of Denver began pursuing the conversion of the associate of science degree and is now five courses away from a full AS to Z degree. By focusing on providing a zero cost option for each requirement of the institution’s AA and AS degrees, Community College of Denver is creating a pathway for students to earn their degree at zero additional textbook cost – and reduces the overall cost for students pursuing other degree paths that utilize AA and AS courses.

Faculty for each grant funded course have the opportunity to work with an instructional designer and digital accessibility specialist at Community College of Denver.

“It is our hope that, with an increased focus on design and digital accessibility, students will benefit from improved content, and the Community College of Denver will see improved student pass rates.”

²⁵ This case study and all quotes within were derived from Community College of Denver’s narrative report.

Positive Impact on Student Learning Measures

In many cases, traditional student learning and success outcomes and metrics see either no change or even positive gains when comparing courses that used OER to those that have not. For example, according to a recent study²⁶, OER:

1. Addresses affordability, completion, attainment gap concerns and learning
2. Improves end-of-course grades
3. Decreases DFW (*D, F, and Withdrawal letter grades*) rates for all students
4. Improves course grades and decreases DFW rates at greater rates for students who receive Pell grants, part-time students and populations historically underserved by higher education.

More recently, a meta-analysis on OER efficacy indicates that, with minor limitations, use of OER saves students money without decreasing their learning. Researchers note that 1) more than 95% of published research indicates OER does not lead to lower student learning outcomes, and 2) most students and faculty who have used both OER and traditional, more expensive textbooks believe OER are of equal or higher quality. Given this research, it is increasingly challenging to justify the high price of textbooks²⁷.

In the grant recipients' reports for the 2021-2022 academic year, many institutions reported similar pass rates for OER and non-OER courses over the prior year. Further, methodology for reporting comparative student outcomes has been inconsistent across institutions. It is further unclear whether instructors remained consistent across these reported sections. It is therefore challenging to draw concrete conclusions from submitted data. As in 2020 and 2021, these data are still proving challenging for institutions to collect, but in 2022 the OER Council will make revisions to the reporting template to produce more reliable data collection going forward. The goal will be for future reporting, particularly when there are fewer complicating variables, to support an interpretation of the data indicating OER have no negative or positive impacts on student success as is typically reported in the existing literature²⁸.

Innovations in Educational Practices

Open Education can benefit learners and educators in ways beyond cost savings by allowing for further innovations in teaching, learning and collaboration. Current and future trends suggest open educational practices can also empower faculty to embrace diversity and advance equitable approaches in educational settings. They even allow for students to play a role in shaping the

²⁶ "The Impact of Open Educational Resource on Various Success Metrics": <http://www.isetl.org/ijtlhe/pdf/IJTLHE3386.pdf>.

²⁷ "Open educational resources, student efficacy, and user perceptions: a synthesis of research published between 2015 and 2018": https://link.springer.com/epdf/10.1007/s11423-019-09700-4?author_access_token=-ddomufEBgUef598h7OMr_e4RwlQNchNBiy7wbcMAY7Pc0s0IGF-oGj1mZ6ESdUvOUJiqYj22TE1JccfmQDtOsHp4hmgFRolpHETD9LeituM3KNAZkDtGVAqFQhKDE4zH7K4ww4TJh9PPUIBmuMA%3D%3D

²⁸ "Open educational resources, student efficacy, and user perceptions: a synthesis of research published between 2015 and 2018": https://link.springer.com/epdf/10.1007/s11423-019-09700-4?author_access_token=-ddomufEBgUef598h7OMr_e4RwlQNchNBiy7wbcMAY7Pc0s0IGF-oGj1mZ6ESdUvOUJiqYj22TE1JccfmQDtOsHp4hmgFRolpHETD9LeituM3KNAZkDtGVAqFQhKDE4zH7K4ww4TJh9PPUIBmuMA%3D%3D

education they are experiencing²⁹. Such approaches include the co-creation and localization of curriculum and open pedagogical approaches to classroom facilitation and instruction—all hallmarks of the OE movement. In the three years of the OER grant program, many faculty members are pursuing these kinds of student-centered projects. Both faculty and students have voiced their intrigue and engagement around this approach to teaching and learning³⁰.

Alignment with State Goals

OER are notable as a data-supported emerging best practice in higher education, and wide-scale use and implementation of OER aligns with the goals put forth in the statewide plan for higher education. In the state’s strategic plan, *Colorado Rises: Advancing Education and Talent Development*, the scaled implementation of OER aligns with several strategic goals, especially Goal Four: Commit to Affordability, Cost Containment and Innovation³¹. Moreover, as part of its broader discussion of responsive learning systems, the [Colorado Education Leadership Council’s](#) (ELC) 2018 report cites the expansion of OER directly as a strategy for leveraging technology to provide access to high-quality educational opportunities³². Finally, with cost containment at the heart of Colorado’s higher education agenda, it is clear OER provide an opportunity to meet the needs of individual students while maximizing state investment.

OER SUPPORTS COLORADO RISES GOALS

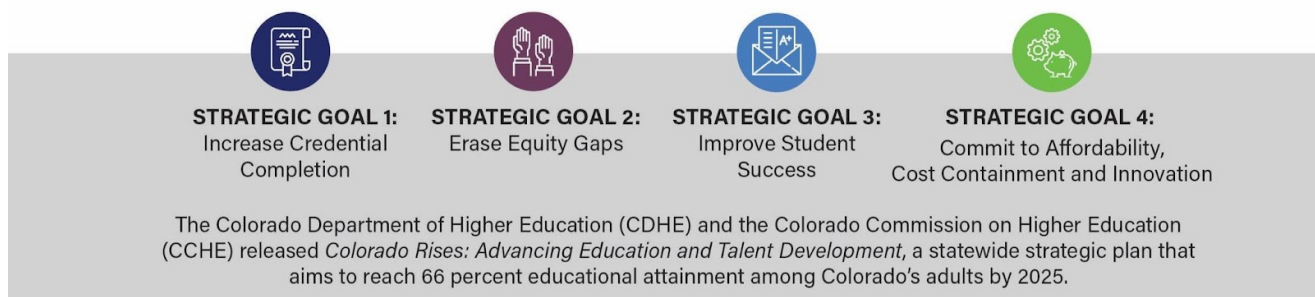


FIGURE 3: Strategic Plan Goals from the CCHE & CDHE

²⁹ “Expanding the Scope: Illustrating the Impact of OER”: <https://sparcopen.org/news/2019/expanding-the-scope-illustrating-the-impact-of-oer/>

³⁰ Instructors reported this strategy at a recent OER conference while students reported their participation at the CDHE’s meeting with the Community College System’s State Student Advisory Council meeting.

³¹ “Colorado Rises”: <http://masterplan.highered.colorado.gov/goal-4-invest-in-affordability-and-innovation/>

³² “The State of Education”: <https://drive.google.com/file/d/16tofb4KjSaCYqfPKI6w3PnDKsY83FDyL/view>

Effects of the Pandemic

COVID-19 Impact on Higher Education and OER Grantees

Beyond the devastating direct impacts of the COVID-19 pandemic, the response and effort to slow it have impacted countless aspects of daily life over the past two years. While the stay-at-home orders early in the course of the pandemic required a rapid response from educators, the lasting impacts have reshaped the perceptions surrounding online learning, remote instruction, and highlighted the needs for flexibility and accessibility of resources in ways previously unconsidered. OER, as inherently adaptable materials, are well suited to the new modes of teaching and uncertain paths forward as Colorado and the world, as a whole, continue to grapple with the reality of living in the times of a global pandemic.

The COVID-19 pandemic has also placed a spotlight on inequities, both global and local. Limitations in access to resources, whether through geography or socioeconomic status, are at the forefront of our collective consciousness. OER offer a means for educators to help reshape barriers and improve access to resources among and beyond those directly impacted by their instruction. Despite an increased interest in OER, the pandemic burnout experienced by many faculty have slowed progress in year three grants. Pandemic related hurdles delayed completion, or in some cases, derailed planned projects. Fortunately, grant receiving institutions responded quickly and adjusted plans to accommodate new needs and redistribute funds. As such, it is expected to see an increase in student savings from year three grants when projects are implemented later in the 2022-23 academic year.

The global pandemic also caused a number of additional needs for learners and educators across the state -- chief among them access to personal devices, such as computers, and the internet. Similarly, national trends suggest the current climate is primed for further adoption and implementation of OER due to a number of factors. Data and recent publications confirm that initiatives to raise awareness of OER are working³³, while the pandemic and recession are factors driving greater interest in the high quality, low cost materials³⁴. Clearly, economic and accessibility needs, as well as the need for the technologies (internet, personal devices, etc.) that enable them, have expanded the need for OER.

³³ See Bay View Analytics and WCET joint report: <http://onlinelearningsurvey.com/oer.html>.

³⁴ Window of Opportunity for OER: <https://www.insidehighered.com/news/2020/08/13/pandemic-drives-increased-interest-open-educational-resources>

Student Perspectives

"It was easier to use and I liked the fact that I didn't have to buy a textbook or lug around a heavy book. It saved me a lot of time too because no matter where I was I could access it which made my life a lot easier and less stressful."

"I'm 57, so am used to [traditional text] books, however, this is a fabulous opportunity to lower the cost of higher education. So thank you very much"

"They were very positive. I told them they were saving \$90 and mentioned that they could do the math to calculate savings for 55 students. One student...told me he was glad two of his professors were using OER materials."

The perspectives of students in the 2017 report³⁵ led to resounding support for a statewide OER initiative. With the majority of survey respondents identifying as students, more than 89% of people surveyed in 2017 agreed with this statement: *"Textbook costs have become a serious affordability barrier to students attending Colorado's colleges and universities."* Since then, and as an outcome of the resulting legislation, campuses continue to survey students formally and informally on their perceptions of textbooks and associated costs; this includes traditional survey methods, as well as ad hoc focus groups in student centers and libraries (see related images below).

Student enthusiasm for making college accessible and affordable remains a driving factor in 2022. Many campuses have also cited the student perspectives as primary driving factors for Open Education work. Moreover, qualitative narratives submitted by community college students as part of a class assignment include the following anecdotes:

³⁵ See 2017 report at: https://highered.colorado.gov/Publications/Reports/legislative/OER/OER_Nov2017.pdf

"The most effective aspect of this course was the lesson sheet (OER) we would fill out for each class. This format allowed me to easily be able to study for the exams and clear up any confusion I had on the homework assignments."

-Colorado Mesa University Student

"As a student that is a Dreamer, without assistance, depending solely on scholarships, I think not having to pay for books in English class would be beneficial. For one, English is one of the courses that every student needs to take, therefore buying a new book every semester because it is a new edition is unnecessary especially if only a few changes were made."

-Community College of Denver Student

Several grantees from the CDHE OER Grant Program have also engaged students in various feedback activities in the libraries. For example, students from a public four-year institution, when asked what they would spend their money on if they did not have to use it for costly textbooks, reported such competing priorities as food, healthcare, and childcare. In the 2021 #RealCollege Survey³⁶, a survey administered by Temple University that was completed by more than 200 institutions and 195,000 students, found the following Basic Needs Insecurity Rates:

38 PERCENT

of respondents were food insecure in the prior 30 days

52 PERCENT

of respondents were housing insecure in the previous year

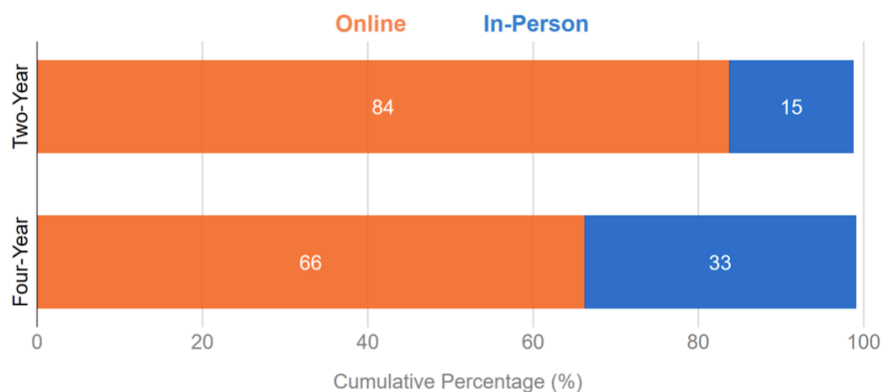
14 PERCENT

of respondents were homeless in the previous year

The Colorado Community College System, Colorado Northwestern Community College, and Colorado State University were among the institutions that participated in the #RealCollegeSurvey. The survey also highlighted the technology gaps and suitable internet access experienced by students most notably during COVID remote education, including by students in Colorado.

³⁶ College and University Basic Needs Insecurity: A National #RealCollege Survey Report: <https://hope4college.com/wp-content/uploads/2021/real-college-2021.pdf> and <https://hope4college.com/realcollege-2020-five-years-of-evidence-on-basic-needs-insecurity/>

ONLINE VERSUS IN-PERSON CLASSES, BY SECTOR



SOURCE | 2020 #RealCollege Survey

NOTES | Rates above do not include students who did not know how they would be taking classes in the fall as institutions navigated the realities of on-campus study during second wave of the pandemic. Cumulative percentages may not add up to 100 due to rounding.



Many students [at my community college] do not have access to updated technology to be able to excel in school. I have had a lot of internet connectivity issues and have been told that is not an excuse to not complete work.”

– a student in Colorado

FIGURE 4: Figure from the #RealCollege Survey highlighting the percentage of students enrolled in online courses in 2020.

The student perspectives on this matter are essential to the story of OER and are the primary force behind this movement. This is because OER saves students money while also providing them high-quality learning experiences. Containing costs and improving learning by leveraging OER is a major motivation for scaling this practice in higher education. For this reason, the Department plans to continue to engage students in the dialogue to help inform current practices, and future decisions. CDHE will continue to further examine students’ classroom perspectives on OER in the coming year through surveys and focus groups.

Faculty Perspectives

Nationally published survey data³⁷ from the Western Interstate Commission for Higher Education's Cooperative for Educational Technologies (WCET) suggests OER initiatives are having a measurable impact on the number of faculty members using OER materials in their courses. The study cites results which indicate that faculty members who are aware of one or more OER initiatives are much more likely to be adopters of OER, regardless of institution, course level and other variables.

This national trend also appears to be true for Colorado educators, as the recent reports from CDHE OER grantees indicate similar sentiments in the form of faculty feedback. As the program is now entering its fourth year, overall awareness of OER has grown, as evidenced by the following. Faculty, staff, and administrators are increasingly more aware of OER or open textbooks with 100% of grantees saying the majority of their colleagues have at least heard of OER and open textbooks and 88% of grantees said colleagues at their institutions are “aware” or “somewhat aware” of OER and how they are used.

Generally, how aware are the majority of faculty, staff and administrators at your institution of open educational resources (OER) or open textbooks?

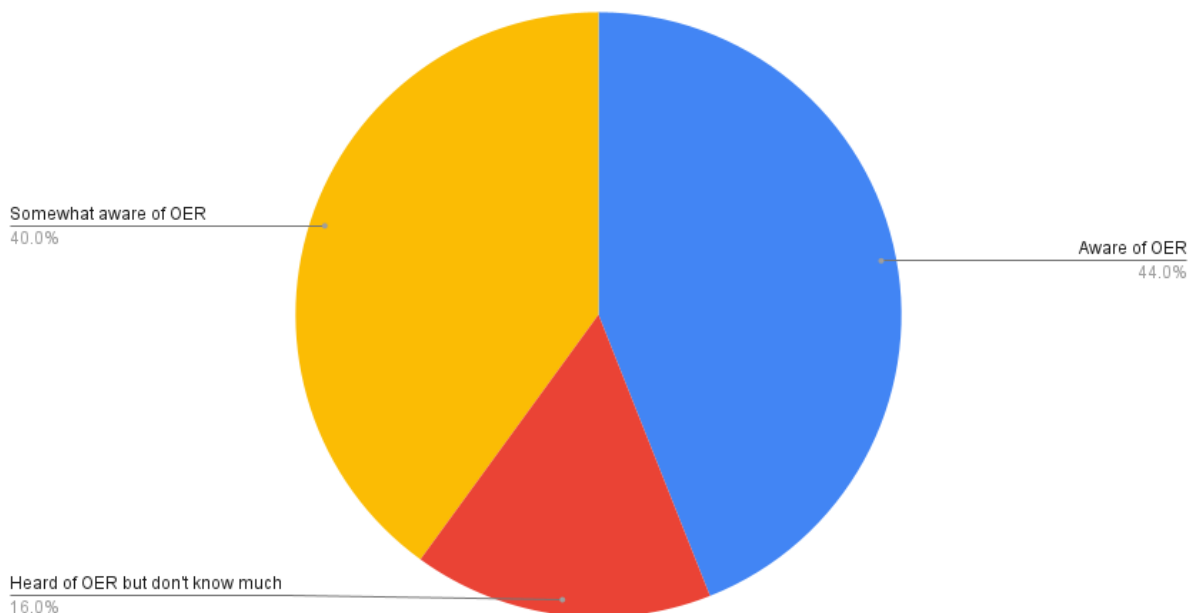


FIGURE 5: Survey responses demonstrating the growth in OER awareness in Colorado.

³⁷The Impact of OER Initiatives on Faculty Selection of Classroom Materials: <http://onlinelearningsurvey.com/reports/impactoforinitiatives.pdf>

This is an increase over last year's survey, and an even greater change from a similar survey in 2017, before the grant program was created. This data represents progress in seeding widespread awareness of OER, thereby encouraging a further widespread culture of utilization of OER in classrooms across Colorado. The survey, discussed later in this report, also indicates an increase in support of faculty from administrators, increase in OER activities, and consideration for OER-related policies.

"Cultivating OER champions has really paid off. We need to stay visible on campus and celebrate faculty who participate. We need to take a team approach to our initiative instead of depending on one person. After [staff] departure it became evident that the work needs to be split among a team so all things can get done properly."³⁸

Involving faculty is essential to the success of this work for several reasons. First, they can advocate for the use of OER over costly traditional textbooks when discussing the selection of course materials with decision-makers on their campuses. Furthermore, as evidenced in the aforementioned case study, faculty can and do enhance their courses and the learning experiences for students when they take advantage of Open Education as a tool to champion inclusive teaching practices. For these reasons, supporting campuses and their faculty by funding the infrastructure necessary to adopt OER is essential for successful statewide OER implementation efforts. The Department should continue to bring faculty perspectives into the conversation for the Open Education agenda in Colorado, both through the OER Council and by other means as opportunities present themselves.

³⁸ Quote taken from CSU-Pueblo's final report submitted by OER Grantees in 2022.

Background

Prior Legislation and Reports

In 2017, to address the issue of textbook/course material affordability and gauge interest for OER in Colorado, the legislature and the Governor, through [S.B. 17-258](#), called for the creation of a statewide Open Educational Resources Council charged with developing recommendations for an OER initiative serving higher education in Colorado. The 2017 report on OER found overwhelming support for further exploration and implementation of OER in the state, particularly from the student respondents who comprised a significant fraction of survey respondents. Based on the findings of the statewide survey, a broad survey of the national landscape, and expert opinion informed by data, the Council and Department made the following recommendations in their 2017 report³⁹:

Scale the use of OER through targeted grant funding, including:

1. Institutional grants to campuses for establishing an OER task force, setting their own OER priorities and disbursing grants in support of these priorities; and
2. Individual or small-group grants for faculty and staff, especially at institutions without an institutional grant or OER initiative, to support OER creation, adoption and promotion.

Support knowledge-sharing, professional development, and community-building by offering opportunities such as:

1. Regular virtual meetings of selected OER interest groups; and
2. An annual OER conference of and for stakeholders from around the state, with keynotes and workshops on specific practical issues.

Establish enabling structure and staffing at the state level with:

1. A standing State OER Council to set statewide policy, oversee grant programs and act as conference organizing committee, among other duties;
2. A full-time staff member in the CDHE to support the above activities and to maintain information resources such as websites and collateral materials; and
3. An annual report to the Legislature describing COER activities and reporting on various metrics of success.

The report, containing the above recommendations, was presented to the Joint Budget Committee (JBC), Education Committee and Colorado Commission on Higher Education for approval prior to considering legislative action. The overwhelming consensus from these governing authorities, as well as the institutions of higher education, was to pursue a statewide OER initiative.

³⁹ Report to the Joint Budget Committee and The Education Committees of the General Assembly Open Educational Resources in Colorado November 2017: https://highered.colorado.gov/Publications/Reports/legislative/OER/OER_Nov2017.pdf

Legislation from 2018

In 2018, [H.B. 18-1331](#), sponsored by Representatives Rankin and Young and Senator Lundberg, was signed into law by Governor Polis. Consistent with many of the recommendations of the Council, this bill appropriated funds for the work of the OER Council including a dedicated staff member the Department, continued existence of the OER Council and required appointment of Council members through fall of 2021. Dedicated funds for the OER Council's work and the statewide grant program were laid out through 2020, with the overall aim of increasing affordability of higher education in Colorado. Officially, the bill's purpose was "expanding the use of open educational resources at public institutions of higher education, and, in connection therewith, creating the Colorado open educational resources council, creating a grant program to support the creation and use of open educational resources, and making an appropriation."⁴⁰ As part of executing the identified responsibilities of this legislation by building a culture around open education as a best practice in Colorado institutions of higher education, Department staff have set forth an agenda to provide staff and faculty with professional development and engagement opportunities at the state level.

Legislation from 2021

Funding for the OER grant program was set to expire with the third cohort in November of 2021. Due to the success of the program so far and the incredible return on Colorado's investment, the Colorado General Assembly deemed this program worthy of continued support stating "that it is in the best interests of the state to continue and expand the open educational resources grant program to support the continued creation and use of open educational resources for individual courses and to support the creation and replication of zero-textbook-cost degree programs."⁴¹ State Senators Chris Hansen, Bob Rankin and Dominick Moreno and House Members Leslie Herod and Julie McCluskie introduced [S.B. 21-215](#) to the Colorado General Assembly in April 2021 to revise Statute 23-4.5-106 moving the repeal date from November 1, 2021 to November 1, 2026. In May of 2021, S.B. 21-215 was signed into law by Governor Polis. This bill also appropriated \$1,108,200 to the grant program for the 2021-2022 state fiscal year, with funds allocated for dedicated staff within the department to manage this program. OER are certain to influence the future of higher education; as many OER programs across the state are in early stages of implementation, continued support from the State is necessary to accelerate adoption and propel Colorado forward as a leader in this area.⁴²

⁴⁰ Higher Education Open Educational Resources: <https://leg.colorado.gov/bills/hb18-1331>

⁴¹ Use Of Open Educational Resources In Higher Education: <https://leg.colorado.gov/bills/sb21-215>

⁴² Concerning the Use of Open Educational Resources at Institutions of Higher Education, and, In Connection Therewith, Making an Appropriation: <https://leg.colorado.gov/bills/sb21-215>

OER Grant Program

Summary

Perhaps most notably from the 2018 legislation, the statewide grant program allocated \$500,000 for the first-year grant cycle for public institutions of higher education in Colorado to initiate and expand the use of OER. The budget was later adjusted to award nearly \$550,000 worth of grants to institutions, with the Council and Department staff deciding this increased allocation of resources to the campuses would offer a larger return on investment. In 2019, the second round of grant funding included \$1 million; the third round included \$875,000 in 2020; and the fourth round included nearly \$1 million in 2021 to Colorado institutions of higher education to continue to build the OER and Open Education initiatives seeded in year one of the legislation. The OER Council selected 32 projects for funding in the second cycle; 27 in the third cycle; and 20 in the fourth cycle to accelerate and continue to enhance the innovative landscape of higher education through Open Education work. 2020-2021 was the closing year as initially enacted in H.B. 18-1331; the success of the program to date and demonstrable return on investment inspired S.B. 21-215 which extended the program for another five years.

Upon initiating the program, the OER Council outlined a grant request for proposals to encourage participation in its first year and to elevate work around OER with the intent of fostering collaboration at the institutional and state levels. This continued into the second year of grants, with a commitment to foster innovation on campus by avoiding prescriptiveness in parameters of the grant; thereby encouraging proposals to meet local needs while allowing for entrepreneurial approaches to Open Education implementation. This has proven to be a strength of the program given the diverse range of needs of various campuses and student populations around the state.



THE PRIMARY PURPOSES AND OUTCOMES OF THE GRANT PROGRAM ARE TO:

- **Address Affordability**
- **Elevate OER**
- **Encourage Innovation**
- **Align institutional and departmental actions with the CCHE Strategic Plan**



Structure of Request for Proposals and Key Dates

As the organizing body, the OER Council in conjunction with CDHE staff, outlined the structure of the Request for Proposals (RFP) and timeline for the third grant cycle which mirrored the first two cycles. To expand reach and compound the grant fund impact, the Council set broad parameters in the RFP to encourage proposals and continue to elevate the conversation around OER. The swift work of the Council resulted in a launch of the grant in early fall 2019, followed by several information sessions for interested applicants, a comprehensive review period and a refined list of recommendations for CCHE consent at the first 2020 meeting. Important dates throughout the process for grant cycle year two included the dates on right.

The RFP was structured in such a format to encourage anything from professional exploration and development with a focus on OER to incentives for creation, adaptation, and/or adoption of OER by faculty, staff, or administrators in institutions of higher education. For the first-year grant cycle, there were two levels of grants, primarily organized by targeted applicant pools and associated requested dollar amounts.

This process was deemed successful and duplicated for the third grant cycle in the fall of 2020 with updates to the timeline to account for delays due to the pandemic. The same process was followed for the fourth round of grant funding that was administered in the fall of 2021⁴³. In 2022 the request for proposals will undergo additional updates to reflect the growth of the grant program.

GRANT TYPES

	Institutional grants Those from public institutions of higher education to support and expand creation, adoption, adaptation, and promotion of the use of OER across the institution and among multiple institutions; ranging from \$10,001-\$100,000
	Individual and small group grants Those from faculty and/or staff of public institutions of higher education, individually or in small groups, to support the creation, adoption, adaptation, and promotion of OER for specific courses, disciplines or programs; ranging from \$250-\$10,000

⁴³ In 2021, significant updates to the Request for Proposals have been made under the guidance of the OER Council to account for maturation of this program and new leadership.

Open Licenses and Accessibility

Pursuant to statute, priorities were clearly noted in the RFP and taken into consideration during the process of holistic proposal reviews. As terms of receiving the funds to support their OER projects and initiatives, grantees have agreed to:

1. Openly license and share, under the broadest possible license, any open educational resources developed or adapted using the grant;
2. Post new or adapted open educational resources to an open repository in editable file formats or with source code; and
3. Comply with the federal "Americans with Disabilities Act of 1990," 42 U.S.C. sec. 12101 et seq., as amended, to enable persons with disabilities to access the open educational resources developed or adapted using the grant.

These points of emphasis allow for the broadest possible foundation for sharing useful material in an inter-institutional approach. Open licensing and accessibility were reiterated as points of emphasis for grantees, both during the proposal and review process, and continuing through the professional development activities sponsored by the CDHE. For example, sessions at the statewide trainings and conferences addressed both accessibility and open licensing to help develop a better understanding and address these topics for educators pursuing OER. CDHE also sponsored seats in the Creative Commons Certificate course in 2022 to provide additional training to faculty and librarians on open licensing. Furthermore, CDHE and several campuses have continued dialogues with national organizations, specifically the Open EducationNetwork, to propose a working group on accessibility in OER⁴⁴. Undoubtedly, these priorities remain intact with the continuation of grant funding, exemplifying the importance of these topics in pursuing the OER initiative.

Year Three Grantees

In year three of the OER Grant Program, 27 project proposals were granted funds to pursue various OER initiatives at their respective campuses. This includes 22 institutional-level initiatives as well as five individual or small group projects.

Moreover, it should be noted in this section that many original proposal responses to the RFP from the campuses articulated larger sums of money for their grant projects. However, again to expand the reach of this year's funding, many proposals were meticulously and intentionally reviewed and suggested for revision in order to avoid redundancy of OER development for common, statewide needs, and to spread as much funding across the state as possible. This is evidence that the continuation of the OER Grant program for the next several years is not only a good idea, but is necessary to meet the potential vision and intent of the educators and institutions in the state of Colorado.

As mentioned previously, preliminary implementation of projects funded by the OER Grant Program have significant projected impact in aggregate cost-savings for students. Institutional grantees have estimated savings of more than \$3.6 million to the students of Colorado at their respective institutions

⁴⁴ Note, through the CDHE, Colorado has become a consortial member of the OTN, affording educators in our state training opportunities and affiliation with national memberships to address important issues such as accessibility in OER.

from the third cycle of grants, and a total of more than \$20.5 million in savings for students from \$2.425 million in funding. The realized student savings represent an estimated 745% return on the State's initial investment (ROI) into this cycle of the program alone. Additionally, assuming most funded OER adapted, adopted, or created in the first three years with the assistance of this grant continued to be used with similar enrollment, the student savings impact will exceed \$45 million in 2023. With continued use of the OER implemented and funded through this program, these figures will continue to compound. Based on feedback, the reporting template will be revised to better capture the continued impact of previous grant cycles.

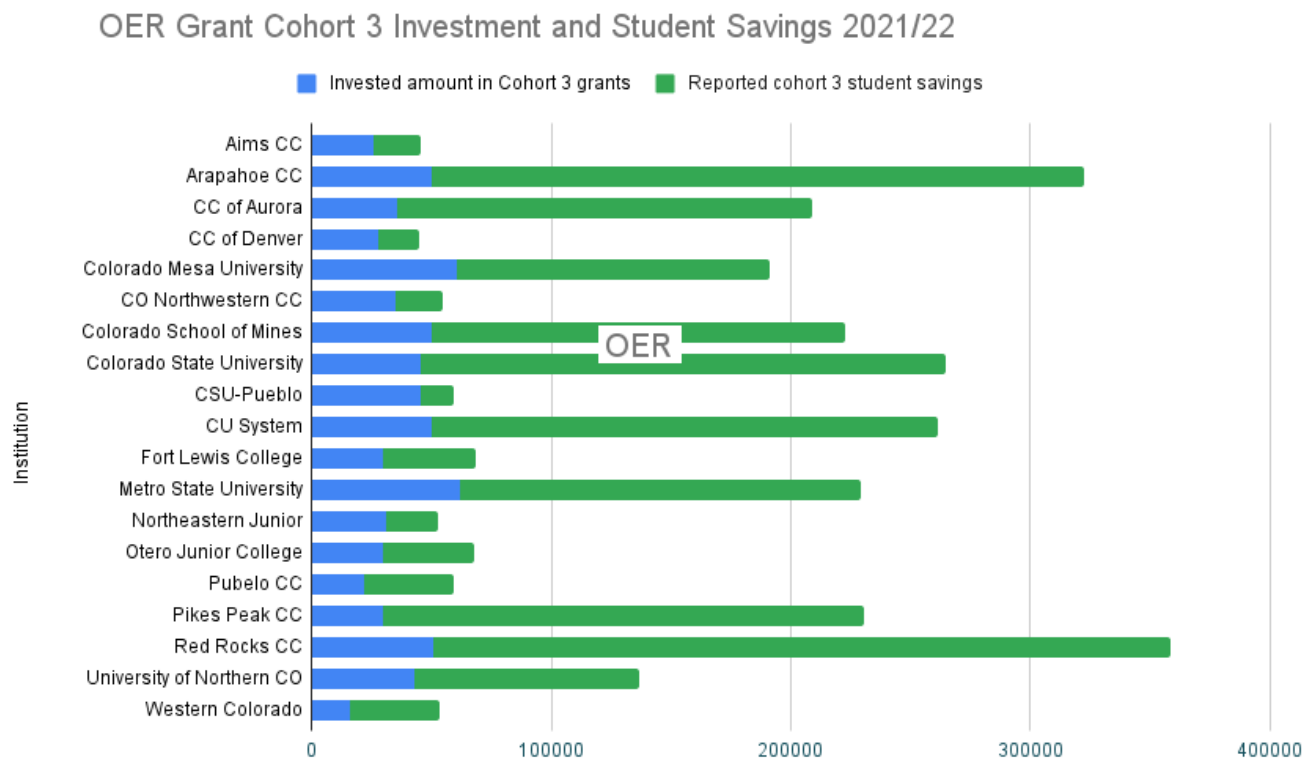


FIGURE 6: The invested amount into cohort 3 grants and the reported student savings.
 Note: This figure does not include two Colorado Community College System grants.

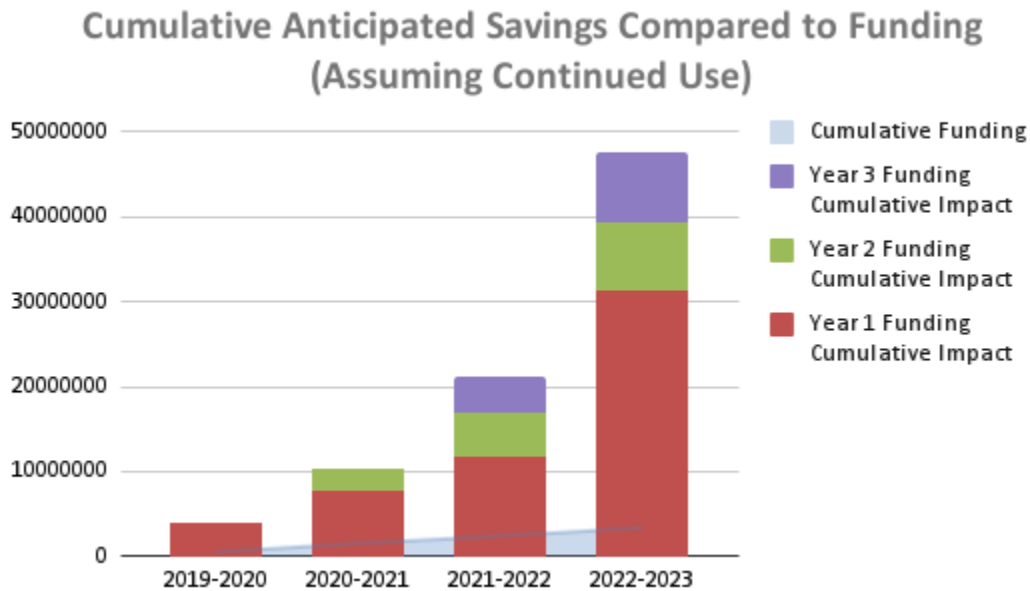


FIGURE 7: Compounded Savings from Grant Funded OER

As noted above, 27 grantees received grants as part of the third cohort, with projects ranging from small group/faculty proposals, to third year, multi-institutional approaches to comprehensive programs. Preliminary projections of student cost savings from cycle three cohort are showing at least a 300% return on the State's dollars, not accounting for continued cost-savings from annual reimplementations of prior funded projects. More importantly, the projects in the third cohort continue to demonstrate the diversity and assets of institutions throughout Colorado.

OER included in strategic plans at Colorado institutions

Aims Community College identified increased adoption of OER as a tactical goal under its five year strategic plan to reduce barriers to access of educational materials. Aims Free-to-Student initiative is charged with increasing OER use in Guaranteed Transfer pathway, high DFW, high student enrollment, multi-sections and Career and Technical courses.

Within the Community College of Denver's 2025 strategic plan, OER development is one of eight strategic initiatives to support the goals of access, success and equity.

Large growth of OER courses offered at institutions across the state

Colorado Mesa University has nearly 300 courses that are low cost or OER in 2022, which represents 12% of their overall courses offered.

At Colorado State University, ECON 204 enrolls over 400 students per semester equates to \$56,000 in student savings every spring and fall. PSY 252 is replacing a textbook that costs \$180 for over 200 students per semester.

Western Colorado University has leveraged OER in the School of Business, which impacts 25% of their overall student population.

In Fall 2022, CSU Pueblo will launch its Spanish Z-degree. The Spanish degree and minor courses will have zero textbook cost.

Increased faculty participation

In the third year grant, Colorado Northwestern Community College experienced increased faculty involvement from 25% to 50% of full-time faculty who will participate in this OER grant compared to the second year grant. CNCC reported that this uptick is anticipated to impact 30%-50% enrollment of students and 100% of high-enrolled arts and sciences courses at CNCC based on historic enrollment data. As of Fall 2022, 90% of arts and sciences guarantee transfer courses are OER as of Fall 2022. This is compared to 53% of courses that were already OER in arts and sciences in spring 2021.

Year Four Grantees

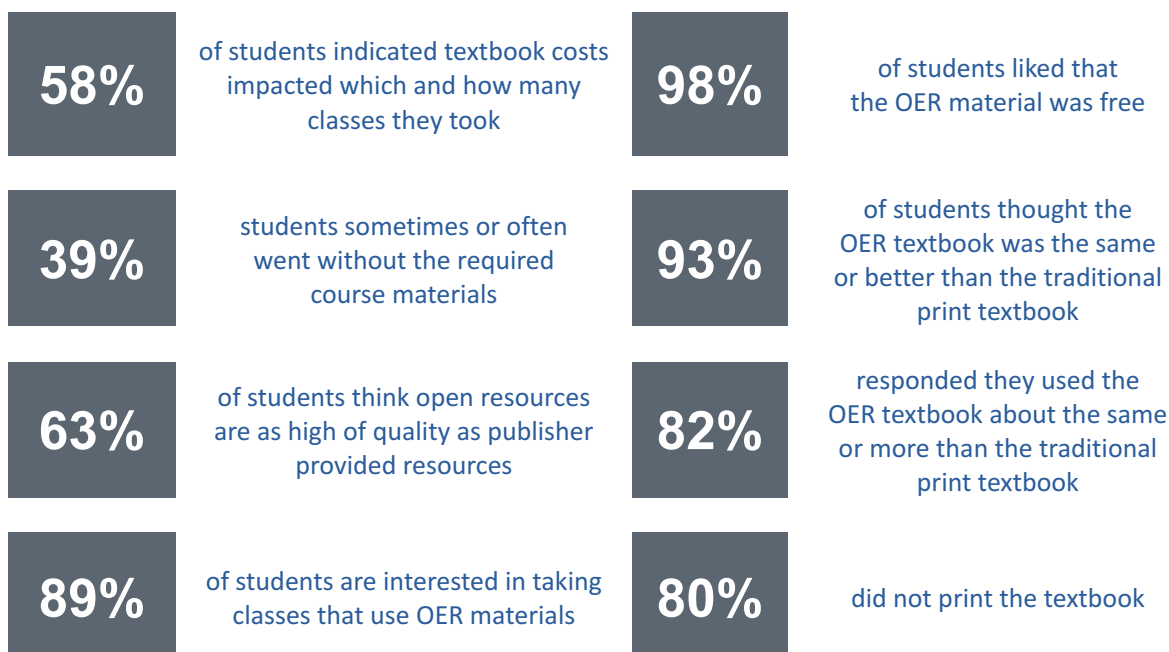
At the close of the RFP in January 2022, there were 29 submissions for the grant, totaling more than \$1.2 million in proposed projects. This is important to Department staff and the OER Council because of the identified goal of 100% awareness of OER in Colorado. Work remains to encourage participation from the remaining five institutions who have yet to directly receive funding. Cycle four proposals were for 19 institutional grants and 10 individual or small group grants. Additionally, for the first year the OER grant program offered the option of applying for two year grants. Out of the 19 institutional proposals, 11 grants requested two years of funding with a total requested amount for year two of \$724,061. \$968,803 was budgeted for the cohort 4 grant cycle and 20 projects were awarded funding.

The OER Council and staff completed a month-long review period in which a comprehensive review and evaluation of each proposal took place. As noted in the RFP, there is a standard expectation and requirement for OER Council members to recuse themselves from reviewing proposals associated with their home institutions and systems. Department staff made pre-notifications of shortlisted proposals available to applicants in February 2022. This afforded institutions an opportunity for future planning with the understanding that final approval of their grant status would take place at the March 2022 CCHE meeting.

OER Grantee Feedback and Themes from Reports

Grantees have given the Department high quality feedback to refine the OER Grant program, while also maintaining the current level of support, which has generally been deemed essential to the work. Most specifically, the grantees are grateful for the State resources dedicated to propelling this work on their campuses. There are also suggestions to improve the operational aspects of the program itself, as well as feedback on strategic alignment of the Open Education work in Colorado. Department staff are taking the feedback into consideration for future iterations of the grant program. Recommendations include a greater focus on the equity aspects of Open Education, continued State leadership of Open Education efforts, a focus on continued support for OER in Guaranteed Transfer Pathways courses, support for further implementation of zero textbook cost initiatives, and enhanced statewide communication of Colorado-relevant OER.

Several campuses collect their own data and feedback via institutional surveys of students and faculty. For example, a self-reported student feedback survey from Arapahoe Community College in 2020 collected the following perceptions.



78%

of students liked or really liked the OER textbook

58%

of students indicated they did not have any difficulties using the OER textbook

These surveys, among others collected by grantees on their own campuses, indicate growth in awareness, receptiveness and affinity for OER and Open Education on various campuses in Colorado. Though each campus and community has different needs, perceptions, and a varying level of implementation of OER efforts, it can be said a growing awareness is one major outcome from the CDHE's efforts with Open Education.

Survey Results & Analysis

Prior grant receiving institutions were surveyed on their Open Education and OER perceptions and current efforts as part of the CDHE's final report on Open Education in Colorado. In 2022, institutions were again surveyed via OER grantees to both assess progress and inform future decisions with regard to Open Education and OER in Colorado.

Metrics with current data and projections

Specific Metric	Measures from 2021 Report	Updated Measures from 2022 Report
Estimated amount of student savings that resulted from using the open educational resources	Actual cost-savings to students from year 1 grantees initial implementations were estimated to be \$3,925,488. Year 2 grantees estimated they saved students an additional \$2,411,695, and preliminary estimates for OER that will be implemented in the 2021-22 academic year from the second cycle grant predict an additional savings of \$358,984. The estimated impact provided by year 3 grantees predicts an additional savings of at least \$918,615, as well as an additional estimated \$1.7 million for non-grant funded OER. In total we estimate Colorado students will	Year 3 grantees estimated they saved students an additional \$3,619,867, which is anticipated to grow as more completed OER from this cycle of grants are implemented in classrooms in fall 2022 and spring 2023. In total we estimate Colorado students will collectively save over \$20,500,000 due to OER with the expectation of continued use of prior funded projects. Assuming continued use, the impact of the first three years of the grant will exceed \$45 million in cost savings for Colorado students.

	collectively save over \$9,000,000 due to OER use in the forthcoming academic year with the expectation of continued use of prior funded projects.	
Measures of the effectiveness of the grant project	Preliminary effectiveness measures of the grant project include number of public institutions participating in the grant program (26/30 eligible public institutions), number of Open Education Ambassadors trained to further OER efforts in their communities (124 representing 27 different institutions ⁴⁵) and number of courses addressed (650) as well as student enrollments impacted (63,809 per year) by this initiative including grant cohorts 1 and 2, and projections from cohort 3 ⁴⁶ .	26 out of 30 eligible institutions have participants in the grant program. This year brings the total number of courses addressed by the OER grant program to over 1,070. The annual student impact of the grant exceeds 60,000 students per grant year based on enrollment data reported by grantees.
Number of students affected by open educational resources	Preliminary aggregated student enrollment for OER courses utilizing grant funding total 63,809 statewide. Additionally, non-grant funded OER courses reported by institutions on a voluntary basis include an additional 14,921 enrollments for a total of 78,730 enrollments overall.	Preliminary aggregated student enrollment for OER courses utilizing grant funding total 64,677 statewide. This number is likely higher for total OER used in non-grant funded OER courses, and for grantee courses without complete data at the time of reporting.
The degree to which all public institutions of higher education are adopting open educational resources support programs and ensuring universal awareness of open educational resources among faculty and students;	There is an increase in institutions adopting OER policies. In 2020, 8% of survey participants reported having institutional OER policies. In 2021 11% of grantees reported having policies in place regarding the use, publication or implementation of OER while another 7% mentioned their institution currently working on	There is an increase in institutions adopting OER policies. 16% of grantee survey participants reported have institutional OER policies. 2022 grantees also reported that 100% of faculty, staff, and administrators at their institution have at least heard of OER. 44%

⁴⁵ The Open Education Ambassador program is part of membership with Open Education Network, two training sessions were included with joining, no further sessions have been held.

⁴⁶ Aggregated data assumes OER from the previous cycle remain in use with similar course enrollment.

	creating a policy or including OER in other ways i.e. master plan. 2021 grantees also reported that 100% of faculty, staff, and administrators at their institution have at least heard of OER and 37% are "aware" or "very aware." Also, only 7% said their campus and administrators were not actively adopting OER support programs, while 67% were somewhat actively, or actively adopting OER support programs.	are "very aware" and an additional 40% are "aware."
The number and percentage of the courses offered by the public institutions of higher education that use open educational resources as the primary resources for the course;	Though many grantees were still unable to respond or did not know, 15 reported between 1-53% of courses use OER. 11 grantees reported between 1-10% of campus courses use OER, 1 said over 10%, 1 said 25%, and 1 said 53% of Guaranteed Transfer Arts and Sciences courses. ⁴⁷	Though many grantees were still unable to respond or did not know, 9 reported between 5-20% of courses use OER. ⁴⁸
The open educational resources created and shared by grant recipients;	The referatory is up on the CDHE OER homepage ⁴⁹ with over 300 resources listed. The referatory is in the process of being updated with the links to the resources created or adapted by year 2 grantees ⁵⁰ .	The referatory is up on the CDHE OER homepage ⁵¹ . The referatory is in the process of being updated with the links to the resources created or adapted by year 3 grantees ⁵² , and options to expand to an OER repository or website to showcase the resources created and shared by grant recipients is being explored in 2023.

⁴⁷Several reporting institutions did not differentiate between OER and no/low cost textbook course, likely inflating these numbers. Numerous grantees claimed this was an estimate, many are working on more comprehensive surveys. Designating courses as low or no cost prior to registration is anticipated to help with data collection going forward.

⁴⁸Several reporting institutions did not differentiate between OER and no/low cost textbook course, likely inflating these numbers. Numerous grantees claimed this was an estimate, many are working on more comprehensive surveys. Designating courses as low or no cost prior to registration is anticipated to help with data collection going forward.

⁴⁹ CDHE OER Homepage Available at: <http://masterplan.highered.colorado.gov/oer-in-colorado/>

⁵⁰ Referatory currently available at:

<https://docs.google.com/spreadsheets/d/1YbvFA-xQm9Q23dHfYeRdkeDYo5SRkuySgpCC4IXbQNM/edit#gid=1251208961> .

⁵¹ CDHE OER Homepage Available at: <http://masterplan.highered.colorado.gov/oer-in-colorado/>

⁵² Referatory currently available at:

<https://docs.google.com/spreadsheets/d/1YbvFA-xQm9Q23dHfYeRdkeDYo5SRkuySgpCC4IXbQNM/edit#gid=1251208961> .

For public institutions of higher education that receive a grant or that employ faculty or staff that receive a grant, the course enrollment, completion, and pass rates for courses that use open educational resources compared to courses that do not use these resources

Though more grantees (14) were able to report on such metrics, and outcomes generally skewed toward positive or neutral, many said due to the pandemic and campus closures these metrics do not paint an accurate comparison to previous, non-OER sections of courses.⁵³

Though more grantees (21) were able to report on such metrics, and outcomes generally skewed toward positive or neutral, but many respondents noted COVID impacts and lower enrollment may be affecting comparison to previous, non-OER sections of courses still.

20 PERCENT

of courses at Aims Community College are OER

17 PERCENT

of Arapahoe Community College courses are OER

16 PERCENT

of Community College of Denver courses are OER

Grant Analysis

In the continued reporting of progress coordinated by the CDHE, grantees were required to identify successes, challenges, and barriers to the current work of their local OER initiatives and projects. A qualitative review of this self-assessed feedback to the grant administrators revealed the following themes first identified in the 2020 report remain true.

Support in the form of resources, training and grants are integral to the success of a scaled approach to OER.

Some are still resistant to change and need further support as they explore OER as a potential fit for their curriculum.

Incentives for participation in OER make for the greatest impact.

CDHE and the OER Council have now gleaned feedback from the first, second, and third cohorts of grantees, as well as those who have participated in other statewide activities, to help inform iterative improvement of both the grant program and all associated activities. The outlined feedback from the campuses, coupled with that of the Commission, shall guide CDHE staff and OER Council in future revisions to processes, offerings and structure. The goal is to ensure a widespread and profound impact from pursuing OER for Coloradans. With the current data and trends that have been reported, it is clear further efforts for supporting and enabling local authorship of the administration of OER activity is of the utmost importance.

⁵³ In all but 5 institutions, results were not found statistically significant using standard comparative error calculations, of those found significant 3 (60%) reported improved pass rates and 2 (40%) reported increase in DFW rates, both of whom were comparing OER to pre-COVID sections.

2022 Colorado OER Conference

The Colorado OER Conference returned in June 2022. The hybrid conference was hosted in person in Denver, and virtually on Zoom. There were more than 300 registrants for the conference. The conference featured the keynote address “Be a Light: A Celebration of the OER Community in Colorado,” from Dr. Tanya Spilovoy, Director of Open Policy for the Western Interstate Commission for Higher Education; a panel spotlighting the work of Colorado faculty; and six breakout presentations.



Dr. Tanya Spilovoy delivered the conference keynote encouraging open education advocates to "be a light" for open education in Colorado and beyond.

Charting the Future of OER in Colorado Session

The conference concluded with a one hour session framed around the following four questions with the goal to gain feedback from conference attendees to determine future open education priorities in Colorado. The session asked attendees to engage with the following questions:

- If there were no limitations, what would OER look like for you, your institution, and Colorado?

- What will make you feel more connected to the Colorado OER community? What community connections do you want to develop to support your OER work?
- What professional development support do you need to meet your OER goals?
- How do we articulate the value of Open pedagogy beyond cost savings?

The feedback collected during the sessions will navigate the work of the OER Council and Department in the coming year. The following themes emerged from written and verbal answers to the session questions.



Zero Textbook Cost as the default

The most common response to the question about no limitations was a variation of zero textbook cost being the default for all courses. Attendees discussed the desire for an educational culture that no matter the size of an institution, faculty would make their work available to others, institutions would recognize OER in promotion and tenure, and there would be open education awareness from pre-k through graduate school levels.



Community Connection

Attendees expressed a desire to connect with others in the Colorado open education community through a common area to exchange information, identify needs, crowd source expertise, and cultivate projects across institutions; working groups that are based on disciplines and/or institutional types; a discipline networking track at the annual state conference, and a conversational channel to engage with others working on OER in Colorado.



Recognition

Recognition of open education work, particularly at the institutional level with recognizing open education in promotion and tenure, was a frequently expressed desire of attendees. Ultimately, conversation steered toward centering the people producing open education work over platforms and tools, providing funding and time release to these individuals, and recognition occurring at institution and state levels for contributions to open education.

Statewide Training and Development Activities

Over the course of the last three years, CHDE and the OER Council facilitated and coordinated professional development opportunities for faculty, staff, and educational administrators as prescribed in legislation. The imperative for appropriately preparing educators to pursue OER and open educational practices in their disciplines derives from a holistic approach to providing resources as well as support for large scale change in approaches to educational resources and implementation of OER. Despite the challenges posed by the pandemic, CDHE saw growth in participation during the annual convening (which was converted from an in-person meeting, to the OER Virtual Summit) as well as continued participation in the Open Education Ambassadors program, which grew by nearly 100% during the second year of the program.

Over the course of the last year, and in addition to the Grant Program, several activities were executed by both Department staff and the Colorado OER Council in alignment with the innovation and capacity-building goals inspired by statute. Broadly, the Department and Council have provided ongoing training through several means. This includes remotely available development sessions, intensive professional training, traditional conference learning and peer-led best practice demonstrations of approaches to OER.

Beyond CDHE and OER Council's efforts, individual campuses have held faculty development sessions for their educators to learn more about using Open Education and OER their courses. This includes facilitating local introductory level training via the Open Education Network "train the trainer" model, which CDHE hosted at Front Range Community College in October 2019 for the Open Education Ambassadors. Local training sessions have taken place at Adams State University, Auraria Campus, Aurora Community College, Colorado Northwestern Community College, Colorado Mesa University and the University of Colorado, to name a few among many campuses conducting local activities.



2021-22 OER Council Activities and Securing Program Continuation

Though the OER Council slowed many outward-facing activities in light of the added strain due to the pandemic and the problems associated with planning activities that may need to change on short notice, the Council worked steadfastly and purposefully to ensure the continued success of this program. The Council's unwavering passion for the Open Education movement and making education more affordable has been a driving factor propelling this movement forward in Colorado since the inception of this organization pursuant to H.B. 18-1331. They have worked tirelessly to support grantees and have been integral in selecting quality proposals to build the program into the success story it has thus far been. As representatives of higher education and grant receiving institutions, these stakeholders have built a robust community and developed intra-institutional relationships, fostering a sense of community around the Open Education movement.

In addition to supporting grantees and assisting with the administration of the grants, the Council has been integral in securing continuation of this valuable program. Over the past year, the OER Council has been hard at work meeting with legislators and preparing documentation to make the case for the continuation of this program. The five year continuation of this program as passed in S.B. 21-215 is thanks in no small part to the OER Council's careful management of the monies from this program and passion for the demonstrable and sizable impacts this program is having on students. Council membership is voluntary; the tireless efforts to promote and solicit the continuation of the OER Grant Program are true testaments to the value of this program and the dedication of Council members. Many original OER councilmembers completed their appointment in the last year, and six new members joined the OER council in 2022.

Staff & Council Recommendations

In 2022, the OER Council's recommendations remain largely the same as in the previous year. An assessment of the landscape of open educational resources and current system or statewide movements, the Department commends the work of the OER Council as progressive, unifying and motivating for change in the future. In fact, beyond CDHE, the OER Council has been commended nationally for its work in OER as they were recently awarded Western Interstate Commission for Higher Education Collective for Educational Technology (WCET) Outstanding Work Award (WOW Award)⁵⁴. This recognition acknowledges both the CDHE and OER Council's commitment to OER work in Colorado and solidifies the impact a unified initiative can have.

As highlighted previously, the OER Council and CDHE recommend the following considerations for continued momentum regarding OER in Colorado:

BUILD STRUCTURE

CDHE and the OER Council must continue statewide leadership. This group will serve as the expert advisory stakeholder body and support OER growth and innovative educational practices throughout the state until they become the default at public institutions of higher education in Colorado.

Institutions must encourage and support campus-level infrastructure and staffing dedicated to the implementation and coordination of OER to propel this work at their respective campuses.

BUILD CULTURE

Intentional efforts to build and foster a strong culture will help sustain open education efforts and prioritize more affordable and innovative education.

CDHE and the OER Council must continue to foster a statewide community to meet their goals of 100% awareness of OER promoting improved quality of educational materials and encouraging the default exploration of OER in course design.

⁵⁴ For award profile, visit: <https://wcet.wiche.edu/initiatives/wcet-awards/wow/media-release-2019>.

BUILD EVIDENCE

Measuring progress and impacts to student cost-savings, student learning and other dimensions of student success will help quantify and qualify the impact of OER in Colorado education.

Assessing how and why OER are being used will help inform the agenda of both this initiative and the CDHE to meet the goals of supporting all learners in all parts of the state.

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Image Credits

FIGURE 1: Consumer Price Index based on Bureau of Labor Statistics data

Source - [Inflation-adjusted Textbook Pain Multiplier for Decision-Makers](#) by Jonathan Poritz is licensed under [CC BY-SA 4.0](#)

FIGURE 2: Table from spring 2021 and fall 2021 general studies courses at MSU Denver by materials cost

Source – Metro State University, Denver

FIGURE 3: Master Plan Costs from CCHE & CDHE

Source – Colorado Department of Higher Education

FIGURE 4: Figure from the #RealCollege 2021 Survey highlighting the percentage of students enrolled in online courses in 2020

Source - The Hope Center

FIGURE 5: Survey responses demonstrating the growth in OER awareness in Colorado

Source – Colorado Department of Higher Education

FIGURE 6: OER grant cohort 3 investment and student savings 2021/22

Source – Colorado Department of Higher Education, data from 2022 OER grantee reports

FIGURE 7: Compounded savings from grant funded OER

Source – Colorado Department of Higher Education, data from 2022 OER grantee reports

FIGURE 8: Survey responses demonstrating the growth in OER awareness in Colorado

Source- Colorado Department of Higher Education survey of OER Grantees 2020

FIGURE 9: Compounded Savings from Grant Funded OER

Source- Colorado Department of Higher Education based on grantee submissions in 2020 and 2021 final and 2021 progress reporting

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