



COLORADO RISES:

Transforming Education Practices

through Open Educational Resources



2021

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



COLORADO
Department of
Higher Education

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

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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 2021 Open Educational Resources Report--*Transforming Education Practices through Open Education Resources*--- pursuant to CRS 23-1-135.

This has been a grant cycle like no other- the COVID 19 pandemic has redefined our need to be agile and transformative to ensure that students continue to have high-quality learning experiences, while continuing to be flexible, responsive, and accessible amid this unprecedented public health crisis. The use of Open Educational Resources (OER) has emerged as a continued best practice and an investment that truly matters- particularly in uncertain times.

Data continues to suggest earning a postsecondary credential improves an individual's earning potential and offers 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 (CDHE) 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, this 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 **\$10.2 million in cost-savings for students**. That figure represents **an astonishing sixfold 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, more than **500 courses** have been developed by OER grantees, reaching more than **60,000 students who have enrolled in courses utilizing OER**.

As the rapidly evolving needs of students, staff, and faculty continue to unfold in the recovery from the pandemic, Open Education and OER remain a strategic priority for saving learners money and promoting innovation and equity in higher education in Colorado. This investment matters.

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

The COVID 19 pandemic has been the defining backdrop of the 2019-2021 grant cycle. With millions of students and families impacted by school closures and changes to operations, the global community has felt the impact as educators and governments continue to mobilize solutions for meeting students' ongoing needs in light of rapidly changing recommendations and directives. In Colorado, institutions of higher education have acted with agility to respond adroitly and safely in order to continue providing learning opportunities in the face of an unprecedented public health crisis. Moving courses into online environments rapidly, while continuing with the academic calendar, was a strategy employed by many to provide safe learning environments at the outset of this pandemic. Impressively, institutions of higher education have been working tirelessly to provide students with high quality learning experiences despite the need for flexibility in uncertain times; this includes further exploration of Open Educational Resources (OER) and practices.

Though the role of Open Education (OE) 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 OE to help maintain access for students learning remotely¹, Colorado stands proud as a champion of OE 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 nationwide 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 offer Colorado a means to help improve affordability of education 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 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](#).

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://highered.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=ACSST1Y2019.S1501>

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

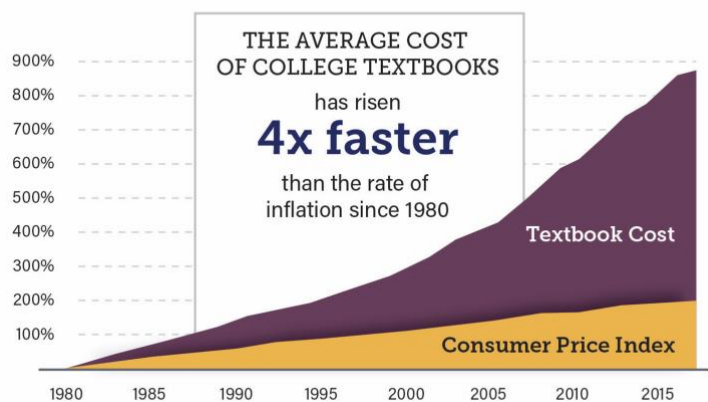
⁵ CDHE Annual Return on Investment Report: https://highered.colorado.gov/Publications/Reports/Legislative/ROI/202008_ROI.pdf

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>

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 \$900 to \$1,800 for books and course materials for the 2018-19 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. As a result of this second year of funding, institutional grantees have reported realized savings estimates totaling more than \$2.4 million and anticipate more than \$350,000 in additional savings in the forthcoming year as more funded projects are completed and implemented. 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 two cycles of this program, the total estimated savings are believed to have exceeded \$6 million in the last year and \$10 million total⁹; numbers which are only expected to grow as this program continues. The potential for OER in Colorado is outstanding. This \$10 million figure continues to represent more than a six fold return on the State's investment into this initiative¹⁰.

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

⁸ College Board: Average Estimated Undergraduate Budgets 2018-19: <https://trends.collegeboard.org/college-pricing/figures-tables/average-estimated-undergraduate-budgets-2018-19>. State Student Budget Parameters 2018-19: <https://higher.ed.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/>.

⁹ \$6 million and \$10 million figures assume the majority of OER from year one continue to be used with similar enrollment to that which was reported in 2020. 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 \$1,550,000 and are further detailed in the budget and institutional profile sections of this report.

With these successes and the demonstrable return on investment, the Colorado State Assembly saw fit to extend the OER grant program for five more years. [Senate Bill 21-215](#) was introduced in April of 2021 and passed in May of 2021. With an appropriated budget of \$1,108,200 for the 2021-2022 state fiscal year, this grant is well positioned to continue to make education more affordable for students at institutions across the state.

Open educational resources, practices and philosophy have inspired educators to innovate by reinvigorating curricula, starting free textbook campaigns and more. This is a direct result of two key factors for institutional capacity: 1) State-supported OER grant funding and training opportunities and 2) the willingness of expert educators from all disciplines to continue to innovate their educational practices for the learning and financial benefit of the students. With support from the state, the open education movement in Colorado is radiant, and the potential is just as bright.

Key Findings

Over the last three 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:

1

Current performance measures indicate a striking return on the State's initial investment.

In addition to an estimated \$10.2 million in student savings from \$1.55 million in grant funding¹¹—over a six 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; that number is believed to have compounded year-over-year. An additional \$2.4 million in student savings occurred during the initial implementation of the second grant cycle. Assuming OER from the first cycle continue to be used with similar enrollments, it's estimated that more than \$10.2 million in total student savings have resulted from the program thus far over the two reported years.
- In the first year, grantees addressed more than 100 courses, more than 300 courses in the second, and in the third, it is predicted at least 98 more courses will utilize OER funded by this program, reaching more than 60,000 anticipated enrollments in courses with OER materials funded by this grant program in the forthcoming academic year.

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.

2

National trends and local data suggest OER support 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, but not all, OER grantees have reported data demonstrating improvements or no negative impact to student learning and outcomes as a result of OER implementation¹²; with various campuses citing increased student engagement or enthusiasm when open education pedagogies are employed by instructors¹³.

- Survey results indicate increases in awareness and large increases in the amount of OER champions on campuses, institutions tracking student cost savings, and administration support for OER¹⁴.

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 Program¹⁵, signaling both a great interest in this field, and an effort to build statewide collaboration¹⁶.
- 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.

¹²9 out of 14 institutions reported statistically insignificant changes to pass rates, 3 out of 14 reported statistically significant positive changes, 2 out of 10 reported statistically significant declines in pass rates, though in such cases institutions were using pre-COVID statistics for comparison. Overall the data trends toward positive outcomes. Reports skewed even more toward positive in response to institutional OER initiatives.

¹³ See Arapahoe Community College student feedback survey.

¹⁴ Results when compared against 2020 grantee survey.

¹⁵ 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. This statistic has been revised from last year and represents an improvement in engagement.

¹⁶ Note: several system or inter-institutional grant initiatives have been funded in the first two grant cycles.

COLORADO OER DASHBOARD

**Grant Cycle:
Years 1 and 2**

**INVESTMENT OF
\$1.55
MILLION AWARDED**

Return on
investment goal

3x

6x

► Actual Return on Investment

\$10.2 million

Cost-savings to students during
grant cycle one and two.

500+
COURSE TITLES
Developed by OER grantees

60,000
Students enrolled in courses
with OER grant materials



2021 NUMBER OF GRANTEES

24

Institutional
grants

8

Small group
projects

2

Professional
development

87% of eligible institutions of higher education participated in the grant program

16

OER Council members
representing 14 institutions and
2 state agencies steering
OER work in Colorado.

120

Open Education Ambassadors
were trained

*Representing 35 institutions
inclusive of 2-year, 4-year,
technical, public and private
as well as K-12 educators.*

1,250

Registrants for the
2020 OER Virtual Summit

*The online format boosted participation
by educators wanting to learn more about
OER during the pivot to online learning.*

Recommendations

Acknowledging the progress so far, the OER Council recommended the below considerations for continued momentum in 2019. The recommendations below are followed by data points which indicate progress toward the vision of the OER Council and CDHE with regard to OE in Colorado higher education.

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.

- **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 collaborations¹⁷ providing those in Colorado with additional personal development opportunities.
- **Next Steps:** Maintain and build partnerships with national entities such as the Creative Commons and Open Education Network to build sustainable relationships and 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 projects¹⁸.
- **Next Steps:** Explore campus-level policies such as inclusion of OER in tenure and promotion criteria while supporting administrative initiatives with campus leadership.

¹⁷ 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.

¹⁸ 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 more than \$2.4 million to institutions for OER initiatives through three grant cycles, the CDHE OER Council have organized more than 20 trainings and workshops for faculty and staff while also adapting a self-paced *Zero Textbook Cost & Equity*¹⁹ professional development course; all freely available to willing 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. Over a third of grantees said colleagues at their institutions are “aware,” or “very aware,” of open textbooks and how they are used²⁰.
- **Next Steps:** Continued, focused, 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 Grantees²¹, several data points indicate a positive impact on higher education through the work of the OER Grantees; most notably more than \$6 million anticipated savings for 50,000 enrolled students in Colorado over the past academic year²².
- **Next Steps:** Partner locally and nationally to establish a more sophisticated and comprehensive data-collection framework for Open Education in Colorado.

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.

¹⁹ As part of *Governor Polis' ZTC Challenge*, see course at: <https://lor.instructure.com/resources/0530de6019704726a00ae6b3947113b0>.

²⁰ Based on survey results from 2021.

²¹ 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.

²² \$6 million savings and 50,000 enrollment statistics assume first year OER are still in use with similar enrollment to prior year reports.

In addition to the OER Council and institutional recommendations, the 2021 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 potential²³. 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 practices²⁴. 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 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.

I had many students reference the OER readings in their reflection papers, discussion posts, and during writing workshops. Especially during the first weeks, having the OER immediately available let students begin learning from it from the first week of class, where traditional for-profit textbooks usually take a few weeks for students to start using. Also, the variety of OER material let me tailor extra readings directly to student's stated needs and interests, particularly in areas of their writing they wanted to improve. Finally, having the OER materials available on a regular website with no paywall meant that students could and did access them from a variety of devices and places outside campus, which was essential for online teaching.

- ARAPAHOE COMMUNITY COLLEGE FACULTY MEMBER

²³ "Colorado Department of Higher Education's Annual Return on Investment Report":

https://highered.colorado.gov/Publications/Reports/Legislative/ROI/201907_ROI.pdf

²⁴ 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/>

Case Study: Open Access - University of Colorado, Denver²⁵

The cost for high-quality peer reviewed materials is rapidly rising. In the most recent Association of College and Research Libraries (ACRL) survey of academic libraries, ongoing subscriptions to serials accounted for an average of 82.6% of materials budgets across all institution types equating to an average \$4.6 Million for subscriptions per library at doctoral institutions²⁶. On a national level, this places the cost of serial subscriptions well over a billion dollars per annum and accounts for hundreds of dollars per student in tuition. Open Access (OA) publication helps to alleviate some of the budgetary strain felt by institutions in their efforts to obtain relevant and timely academic materials all while enhancing equitable access.

Though this report largely focuses on the realized financial benefits and student success related to the OER grant program, numerous projects produced through grant funding have far less measurable, but no less meaningful, impacts. One such project at the University of Colorado Denver was granted funding in 2020 to build an OA press to enable publication and dissemination of open works, ThingPress. The inaugural activity of ThingPress was to create an open journal titled *Cases on Leadership for Equity and Justice in Higher Education* (CLEJHE). This publication fills a need for affordable access to timely cases on leadership in education and offers doctoral students a venue to publish their works and experience peer review first hand. In this way, the journal improves access to affordable quality resources, helps to disseminate the very values driving the OER movement, and offers students a chance to learn some aspects of a scholastic career and distribute their work, enhancing career prospects post-graduation.

The last year of development was focused on acquiring the necessary publication and access software, building web pages, developing standards for the journal, and peer reviewing articles. The first issue of CLEJHE is prepared and ready for publication with an anticipated publication date of September 30, 2021. After publication to the primary page hosting this journal, the issue will be submitted to two OER repositories, Merlot and OER Commons.

Grant funding has been instrumental in developing this program. While financial impacts are difficult to assess, the benefits of this project are certain to be widespread and lasting. As such, this project offers a sample of the potential for OER to transform higher education beyond textbook replacement.

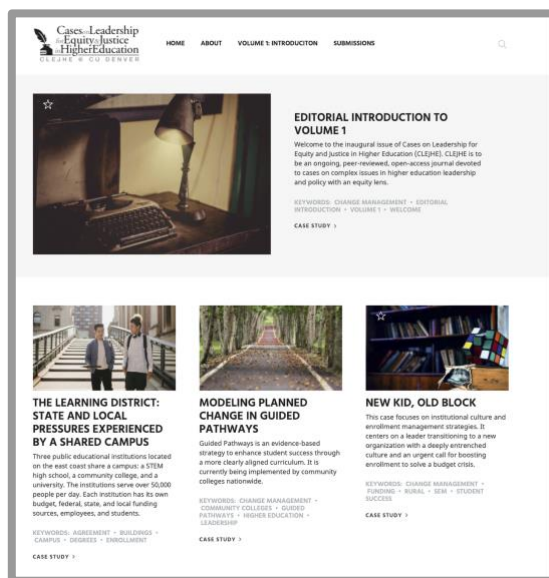


FIGURE 2: Homepage for *Cases on Leadership for Equity and Justice in Higher Education*

²⁵ This case study was derived from the University of Colorado, Denver's narrative reporting and the supplemental documentation they provided.

²⁶ The 2019 ACRL Academic Library Trends and Statistics Annual Survey: Mapping results to the ACRL Standards for Libraries in Higher Education. *College & Research Libraries News*— <https://doi.org/10.5860/crln.82.2.87>

Case Study: A Multi-Faceted Approach to Gaining Faculty Buy-In - Metropolitan State University of Denver²⁷

There is no one-size-fits-all solution to OER promotion. Most campuses need to raise awareness of OER. Further, some faculty may require incentives to encourage adoption, adaptation, or creation of OER. With adequate funding and broad institutional support, there is no reason that many of these hurdles cannot be addressed. For the 2019-2021 grant cycle, Metropolitan State University of Denver (MSU) was awarded \$76,000 and contributed nearly \$25,000 of their own funds to cast a broad net and quickly fill many of these needs in their Running the Open Road II: Second year of the Open Roadrunners program.

For the second cycle of this grant MSU had four primary foci for their OER program expenditures:

- Open Textbook Review Workshops- Rather than simply promote OER, MSU adopted a novel approach. It is difficult to comprehend how or where OER might be used without a thorough understanding of the offerings. To help faculty build this comprehension, MSU offered a stipend of \$200 to any faculty who attended Open Textbook Review Workshops and posted a public review of an OER. While this does not guarantee these faculty will utilize OER in their courses, it does improve their awareness of the resources and incentivises their close examination of at least a single resource. This not only might help to improve the OER they have chosen to review, but also increase the chances they will adopt OER in the future having seen the quality of such items first-hand. Over the course of this grant year MSU has had 36 workshop attendees, 27 of whom completed the review requirement to receive the \$200 stipend.
- OER Faculty Learning Communities (OER FLCs)- To build awareness and community surrounding the OER initiatives at MSU, faculty were incentivised to participate in FLCs. The structure of the program was such that faculty would receive \$500 for attending at least five of seven OER FLC meetings which included accessibility training and opportunities for cross-campus collaboration. Through the 2020-2021 academic year there were 19 participants in the OER FLC program. About FLCs, one faculty member was quoted saying,

"I am also working with a faculty member in statistics. We are sharing material and resources. We met through the FLC."

- OER Adoption Grants- Small incentives can have a massive impact on student expenditures. It is no secret that converting courses with high enrollment to OER will have a greater financial impact than those with low enrollment. What's more, these same high enrollment courses are usually lower level, introductory courses. A vast existing library of OER supports introductory, high-impact courses. In such courses, adoption projects can be as simple as switching textbooks and require little incentive to encourage faculty to do so. MSU funded 48 such adoption projects over the past year with small \$750 incentives. About adopting an OER, one instructor noted,

"I don't think the OER resource itself is substantially different than what I otherwise would use. However, I do think having the main textbook available for free allowed more students to stay up to speed with the readings."

²⁷ This case study and all quotes within were derived from Metropolitan State University of Denver's narrative report.

- Multi-section OER adaptation or creation projects- In these nascent stages of OER, there are certainly gaps in subject area coverage within extant resources. Sometimes OER must be heavily modified or purposefully created to fill these gaps. Additionally, multi-section courses demand more attention and care than single session courses because cohesion between multiple sections is critical to student success. This is a far greater undertaking than mere adoption; as such, MSU funded these projects at higher rates than OER adoption. Because of the cost and temporal commitment to such projects, MSU specifically targeted high-impact courses for this facet of the grant. Faculty working on such projects were granted three credits of reassigned time or equivalent value (\$3,600) in salary supplement. Additionally, several projects were awarded additional funding to build or create new OER.

Through taking numerous approaches, MSU has managed to facilitate one of the most impressive cost savings among year two grant recipients. In total they estimate over \$1 million dollars in annual savings for their students from OER, of which more than 80% or \$819,000 is, at least in part, attributable to this grant. Further the grant has impacted more courses at the institution than any other grant receiving institution this cycle, with 71 distinct courses reportedly using grant funded OER. Additionally, they have reported gains in student learning outcomes and success measures over traditional course materials in most all impacted courses.

One instructor reported,

“Students felt that [the OER] provided a good base for reading the other more complex and advanced articles and videos. They felt it was easy to read and follow and provided good definitions and context for the course.”

In these early stages of OER program development, it is critical to build institution-wide engagement and awareness. The more engagement options offered to faculty, the more likely the movement will catch their attention, if only for a small reward. The success at MSU demonstrates the power of diverse and innovative approaches to faculty outreach and engagement and the extraordinary potential for this program.

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 study²⁸, 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 textbooks²⁹.

In the grant recipients' reports for the 2020-2021 academic year, many institutions stated COVID-19 has complicated comparisons between OER and non-OER or prior year courses. Further, methodology for reporting comparative student outcomes has been inconsistent across institutions; of those who were able to retrieve such data, 14 grant recipients in total, some reported sections in the same academic year who used non-OER materials, while others reported on prior year pass rates for the same courses. It is further unclear whether instructors remained consistent across these reported sections. It is therefore challenging to draw concrete conclusions from submitted data. Nevertheless, nine Colorado OER grantees that had implemented OER in place of commercial textbooks reported metrics indicating OER had statistically insignificant impacts on student success measures, while three grantees reported metrics indicating statistically significant positive impacts³⁰. Notably, Red Rocks Community College reported a pass rate of 89% for OER sections compared to 75% for non-OER sections. Further, MSU reported seeing higher rates of enrollment in ZTC courses. In their narrative reports, no institution reliably reported worse overall student success with OER across campus³¹. Despite the trend toward no-impact or improvement, likely due to overall declines in student success surrounding the COVID 19 Pandemic in 2020-2021, two grant recipients provided metrics for grant funded OER indicating a statistically significant decline in DFW rates for funded OER courses compared to past year pass rates. Community College of Aurora was one such institution, though in the narrative they reported institution-wide OER success rates were statistically insignificant as compared to prior success measures despite an institution-wide decrease in pass rates of 7% over the 2020-2021 academic year, indicating what may be an increase in student success, despite the appearance of neutral or negative relative outcomes.

²⁸ "The Impact of Open Educational Resource on Various Success Metrics": <http://www.isetl.org/ijtlhe/pdf/IJTLHE3386.pdf>.

²⁹ "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_e4RwlQNchNByi7wbcMAY7Pc0s0IGF-oGj1mZ6ESdUvOUJiqYj22TE1JccfmQDtOsHp4hmgFRolpIHETD9LeltuM3KNAZkDtGVAqFQHkDE4zH7K4ww4TJh9PPUIBmuMA%3D%3D

³⁰ Statistical significance was calculated using standard comparative error calculations based upon sample size and deviation from the mean.

³¹ Fort Lewis College reported a decline in pass rates relative prior year pass rates in non OER courses (80% compared to 88%) but stated the pandemic is the culprit, not OER. All other institutions reported positive, insignificant differences, or refrained from reporting.

As in 2020, these data are proving challenging for institutions to collect; with the help of the OER Council and the incoming director of open education and learning innovation, revisions to the reporting template are planned 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 literature³².

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 education they are experiencing³³. 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 learning³⁴.

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 Innovation³⁵. 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 opportunities³⁶. 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.

In 2020, OER was included in Governor Polis' *Roadmap to Containing College Costs and Making College Affordable*³⁷ as a key strategy to expand access and lower textbook and course material costs. In this light, the work of the OER grantees and the Department's work with the OER Council is crucial to making this Roadmap a reality for learners across the state. As explained by Governor Polis during the launch of the Roadmap:

³² "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_e4RwlQNchNBiyi7wbcMAY7Pc0sOIGF-oGjl1mZ6ESdUvOUJiqYj22TE1JccfmQDtOsHp4hmgFRolplHETD9LeituM3KNAZkDtGVAqFQHkDE4zH7K4ww4TJh9PPUIBmuMA%3D%3D

³³ "Expanding the Scope: Illustrating the Impact of OER": <https://sparcopen.org/news/2019/expanding-the-scope-illustrating-the-impact-of-oer/>

³⁴ 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.

³⁵ "Colorado Rises": <http://masterplan.highered.colorado.gov/goal-4-invest-in-affordability-and-innovation/>

³⁶ "The State of Education": <https://drive.google.com/file/d/16tofb4KjSaCYqfPKI6w3PnDKsY83FDyL/view>

³⁷ See Roadmap at: <https://highered.colorado.gov/Publications/Reports/Roadmap-to-Containing-College-Costs-and-Making-College-Affordable.pdf>

“We know that when Coloradans have more access to affordable educational opportunities, they thrive, and the benefits ripple across our state and help our economy. This roadmap lays out ways we can lower costs while maintaining high standards. We must work together to help bring down college and community college costs, encourage innovation, and support the next generation of students³⁸.”

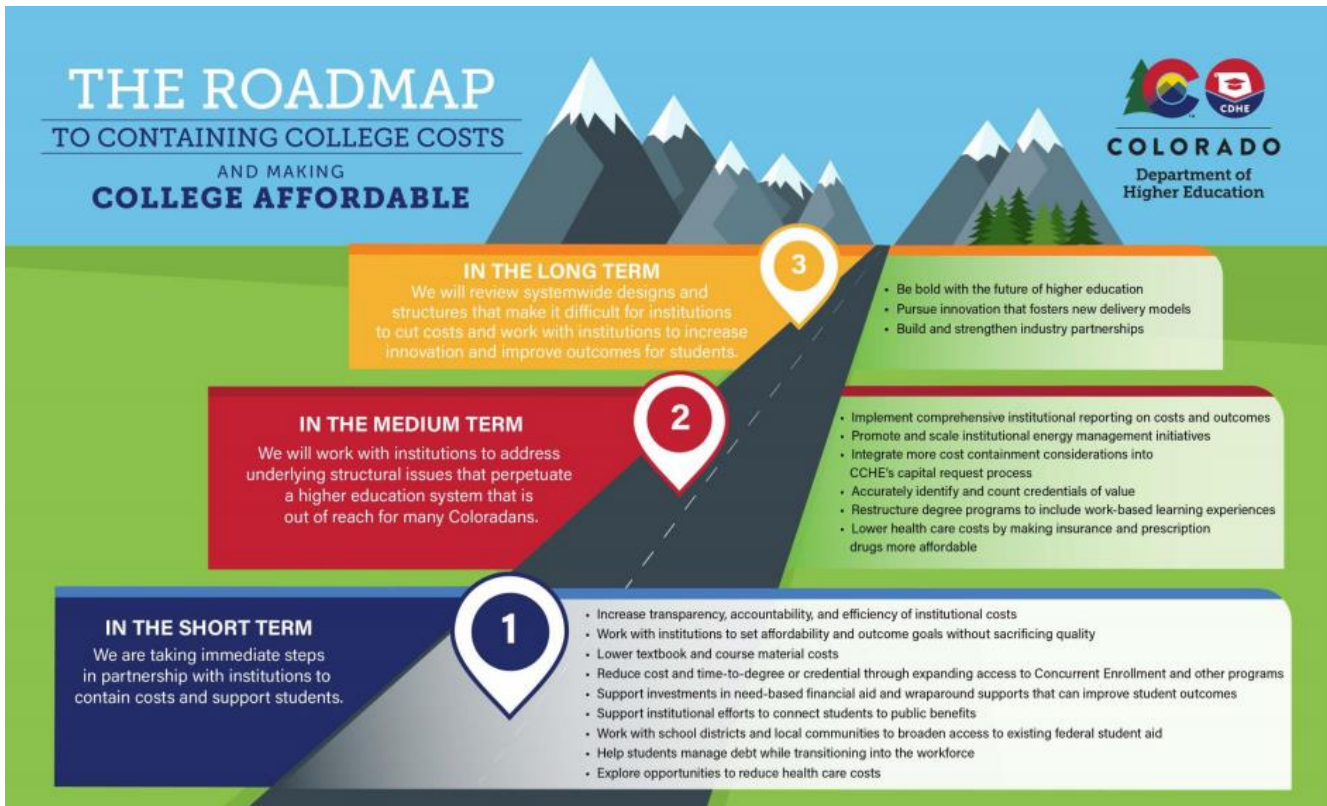


FIGURE 3: Image of the Affordability Roadmap

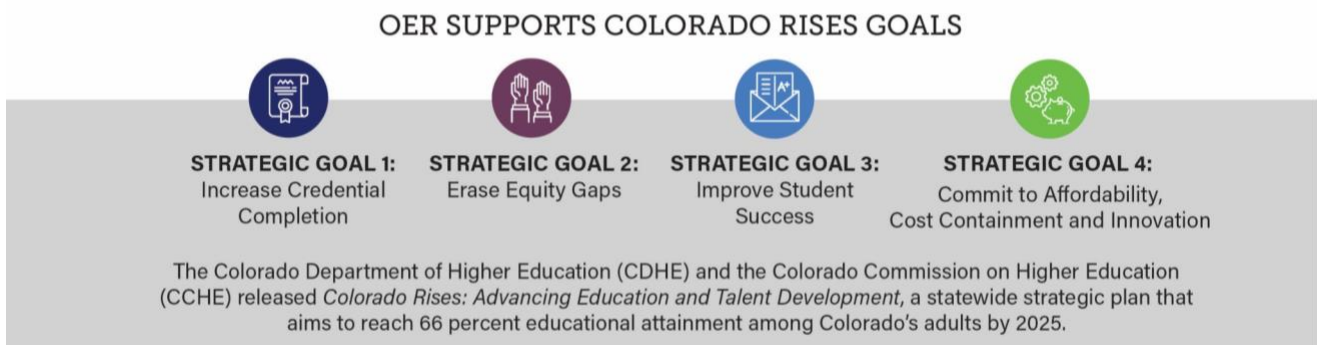


FIGURE 4: Master Plan Goals from the CCHE & CDHE

³⁸ Quote via: <https://source.colostate.edu/gov-polis-announces-roadmap-to-build-on-college-affordability-efforts-for-colorado/>

Effects of the Pandemic

COVID-19 Impact on Higher Education and OER Grantees

Beyond the devastating direct impacts of the COVID-19 virus, the response and effort to slow it have impacted countless aspects of daily life over the past 18 months. 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 a confluence that may have increased interest in OER, the pandemic disrupted some planned OER projects for Year 2 grantees. For many institutions, sabbaticals were placed on hold and adjusting courses to new formats placed additional strains on educators. These new 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, more than \$350,000 in additional savings are expected from the second cycle of the grant as delayed projects are completed and implemented in the forthcoming scholastic 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 working³⁹, while the pandemic and recession are factors driving greater interest in the high quality, low cost materials⁴⁰. 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.

In an effort to address these needs in real time, CDHE staff and the OER Council recommended that the Colorado Commission on Higher Education (CCHHE) act to approve a proposed reallocation of OER conference funds, in the amount of \$40,000, to expand access to essential technologies for students in greater need due to the COVID-19 crisis. This proposal was taken as a formal agenda item during the April 2020 Commission meeting and approved unanimously. The below passage is an excerpt from the agenda item presented to the Commission outlining the proposed change in budget usage⁴¹.

³⁹ See Bay View Analytics and WCET joint report: <http://onlinelearningsurvey.com/oer.html>.

⁴⁰ Window of Opportunity for OER: <https://www.insidehighered.com/news/2020/08/13/pandemic-drives-increased-interest-open-educational-resources>

⁴¹ Original agenda item can be found in the CCHHE meeting archive at: <https://highered.colorado.gov/about-cche/general-information/2020-meeting-schedule>.

Like everyone in the world, those in higher education and state government were challenged while responding to and administering appropriate actions to address the new needs caused by COVID-19. Colorado was no exception as institutions of higher education transitioned to remote or online instruction. This transition allowed them to continue to provide high-quality educational experiences to Colorado students, while not compromising the health and wellbeing of the individuals and communities we serve. During this transition, our most vulnerable students were at risk of being left behind if they lacked access to sufficient technology and equipment to adequately engage in online and remote learning.

Given this challenge, Dr. Angie Paccione and Department leadership convened the chief executive officers (CEOs) of the institutions of higher education throughout the state to identify their immediate needs. Following that conversation, the Department administered *Institutional Technology Need Survey*, to assess the technological needs of institutions in moving to fully online instruction for the remainder of the academic year (and potentially beyond). The survey results revealed a significant need for technology-related supplies such as laptops, cameras, monitors and hotspots to enable remote learning. One CEO response from the survey reads:

To address these needs, the Department stood up its new initiative called *No Lapse in Learning* to ensure further access to such technologies for students in need. Preliminary projections based on the survey responses suggest a need for over 1,200 laptops in addition to other supplies.

Because many OER are digitally accessible, the OER Council has taken a special interest in helping support institutions as they scale online learning rapidly. In addition to compiling and disseminating practical open education-related resources and supporting online instruction at their home campuses, the OER council feel that is in alignment with their mission to support the *No Lapse in Learning* initiative financially.

In collaboration with Department staff, the OER Council initially budgeted \$40,000 for the 2020 Statewide OER Conference, set to take place June 4 and 5 at Colorado School of Mines. Due to the public health crisis facing Colorado and the United States, the OER Council postponed the annual OER Conference to October 2020. Therefore, the OER Council reallocated this budget of \$40,000 to the *No Lapse in Learning* initiative.

As noted in the letter from the OER Council chairs:

"...We are all adapting to remote instruction, so too are students who are looking for ways to access these new course formats...Educators are charting new territory as our higher education institutions seek to deal with COVID-19 and we recognize that, while the transition to remote instruction may be necessary, our students are at risk of being left behind because they don't have access to the required technology. Providing access to technology, such as laptops and hotspots, is consistent with the objective of open educational resources: the cost of education should not be a barrier for students. "

This proposal embodies the spirit of open education and expanding access to education for Colorado students. The OER Council's report, submitted to this Commission, the Joint Budget Committee and the Education Committee, found increased adoption of freely available teaching and learning materials could significantly benefit students through cost savings, improved learning and higher student retention. HB18-1331 created the statewide OER Council and grant program that was informed by a 2017 CDHE Report. 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. The OER Council strives to make education more accessible and equitable through freely available teaching and learning materials. While the Council's plans for the year have shifted due to the extreme circumstances, we are excited to support this program to ensure Colorado students continue to receive a high-quality education.

By approving the redirecting of these funds, the Commission helped meet the following needs in alignment with the goals of *Colorado Rises*:

- **Erasing Equity Gaps:** Furthering access for students in need of technologies not only helps meet an immediate need for technology, but also demonstrates a long-term commitment to open education infrastructure in Colorado institutions of higher education.
- **Improving Student Success:** Expanding access to necessary technologies helps support student success in online and remote learning, ensuring access to high-quality experiences provided by institutions.

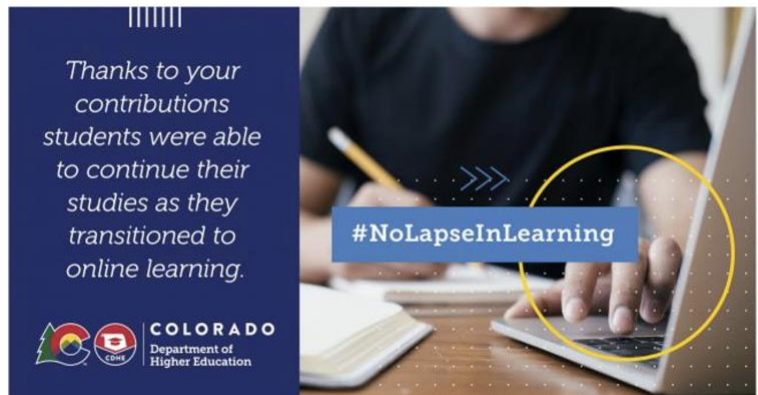


FIGURE 5: Image from the #NoLapseInLearning campaign

- **Containing costs and pursuing innovation:** Expanding access to technologies and further enabling the use of OER on campuses is consistent with the longstanding mission of this initiative, while affording student access to necessary technologies helps to contain costs for their educational and everyday needs.

Reallocation of the conference funds to support the *No Lapse in Learning* initiative extends the spirit of expanded access to open educational resources both for the immediate needs of students learning online and in the long-term investment to enable infrastructures necessary for sustainable open education work. Already awarded OER Grants will remain untouched and supported to their full effect as institutions continue to incorporate OER in everyday instructional practices.

The response from grantees was highlighted by continued action, and requests for flexibility with regard to the grant program requirements. In particular, the pivot to online learning added additional, unexpected responsibilities for many of the OER advocates who are also experts in digital learning. Thus, CDHE made adjustments to reporting deadlines, and allowed for further adjustments to budgets to expand the use of OER while meeting the needs of the newly mandated online environment. The excerpts below highlight the grantees' response to the use of OER during the pivot to online learning and also offers some perspectives on further challenges.

"We know there is still a lot of work to be done. The pivot to online learning in the middle of Spring 2020 semester confirms for us the importance of OER. That so many of our students are financially impacted by COVID, and likely will be for a while, gives us more interest in promoting our work." -FRCC Grantees

"May 2020 the [local] OER ambassador offered a 2-day intensive in-service and one-on-one training sessions with faculty to emphasize Task Force and grant goals. The original plan was to offer this face-to-face at each campus but due to COVID this was offered remotely." -CNCC Grantees

"OER links were incredibly useful when we switched to remote teaching. I did NOT want students to have to pay any additional fee when we moved to remote learning. I shared these resources with my colleagues across [the institution], the week before we went to remote teaching." -CU Grantees

Though OER seemed to support educators in the transition to online learning, as noted previously, the impacts of the pandemic have continued to prove cumbersome for some of the actual grant program processes. Though the CDHE granted additional time and flexibility in reporting and also extended deadlines and timelines related to the grant process, in order to meet the required reporting date for this October 1 report, campuses were stretched even more to align with statutory expectations.

As the research concludes, both national and local findings demonstrate the value of OER and their relevance to meet the many challenges facing higher education institutions and students today. Thanks to strong state investment, the scaled use and implementation of OER and open educational practices will continue to contain costs and drive innovation in a broad array of learning environments.

Student Perspectives

"I think it is better because it is always accessible to me and I do not have any pent up anger towards it because it is free."

"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 report⁴² 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).

"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."

⁴² See 2017 report at: https://highered.colorado.gov/Publications/Reports/legislative/OER/OER_Nov2017.pdf

Student enthusiasm for making college accessible and affordable remains a driving factor in 2021. Moreover, Department staff engaged with the CSGC to launch a student-facing campaign in which students could share their perspectives on OER in Colorado. The campaign created a survey and toolkit for students to complete in order to share their opinions and have their voices heard on the matter of OER and the cost of learning materials in Colorado. The Department created a dedicated webpage to the effort, which is called *S'MOER: Saving Money through Open Educational Resources*⁴³. This open relationship with the students will help the initiative maintain a focus on the learner-focused, educator-centered approach to this initiative.

Many campuses have also cited the student perspectives as primary driving factors for Open Education work. At Western Colorado University, faculty who implemented OER in their course as a result of the grant funding were asked, “*How did your students respond to OER when you told them what you were doing?*” Responses from instructors were candid and are captured below:

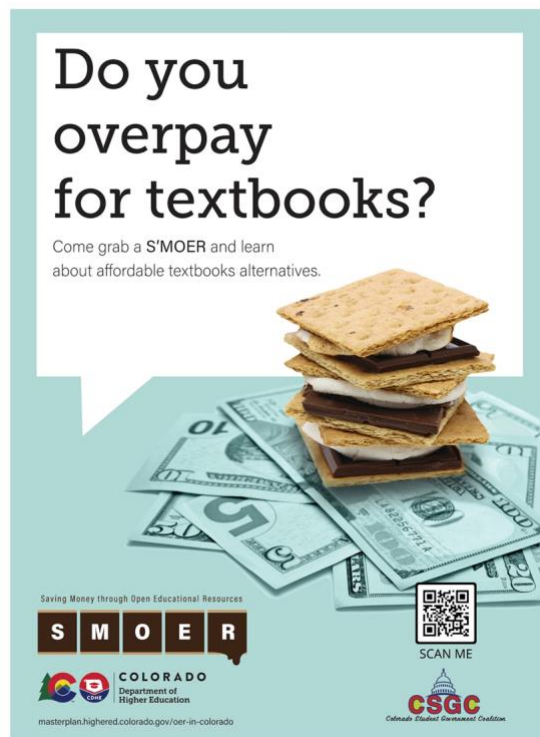


FIGURE 6: Image from the student campaign with CSGC

“Surprise; almost universal expression of being pleased with the option (when polled).”

“They seemed excited to not have to spend money on a text⁴⁴.”

“There was an audible sigh of relief when I announced this in class.”

“They seem quite grateful. One student emailed me recently and said, ‘I certainly appreciate the downloadable files to help save costs!’”

Moreover, qualitative narratives submitted by community college students as part of a class assignment include the following anecdotes:

“I think that the option not to pay for textbooks at this college would be beneficial and helpful. The cost for textbooks for only two classes was pretty overwhelming and ridiculous...even for USED BOOKS. They were so expensive that I looked for an alternative, which I did through Amazon...Though I did find a cheaper alternative, it was still money that was taken away from rent, groceries, and tuition that I pay every month.”

-CCD 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.”

-CCD Student

⁴³ See the dedicated webpage at: <http://masterplan.highered.colorado.gov/smoers/>.

⁴⁴ Source: July 2019 CDHE OER Grantee progress report.

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 student 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. This included holding two open meetings for students to submit feedback on the OER initiative and voice their suggestions for future work in this space in fall 2019 and maintaining a position on the OER Council for student representation.

CDHE acknowledges continuous engagement with students is one of the most effective approaches to informing the work of the Department as a whole, and therefore an area of growth in terms of research. For this reason, CDHE intends to further examine students' classroom perspectives on OER in the coming year through surveys and focus groups, with the aim of capturing the student voice to be included in the next edition of this report.

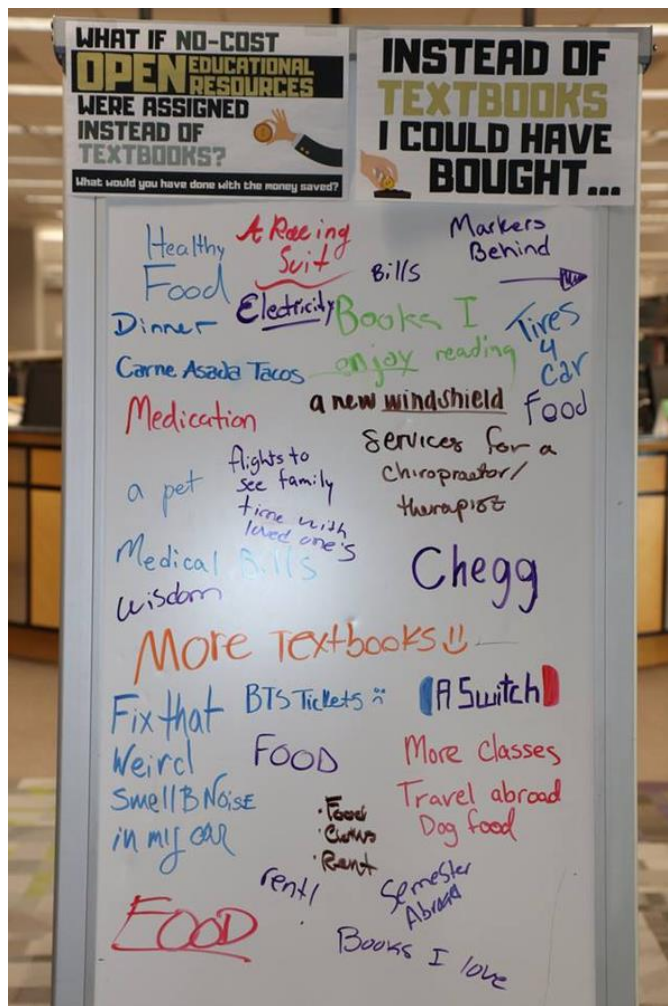


FIGURE 7: Students respond to prompts asking about competing financial responsibilities, making a greater case for OER.

Faculty Perspectives

Nationally, recently published survey data⁴⁷ 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 third 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 open textbooks and over a third of grantees said colleagues at their institutions are “aware,” or “very aware,” of open textbooks and how they are used.

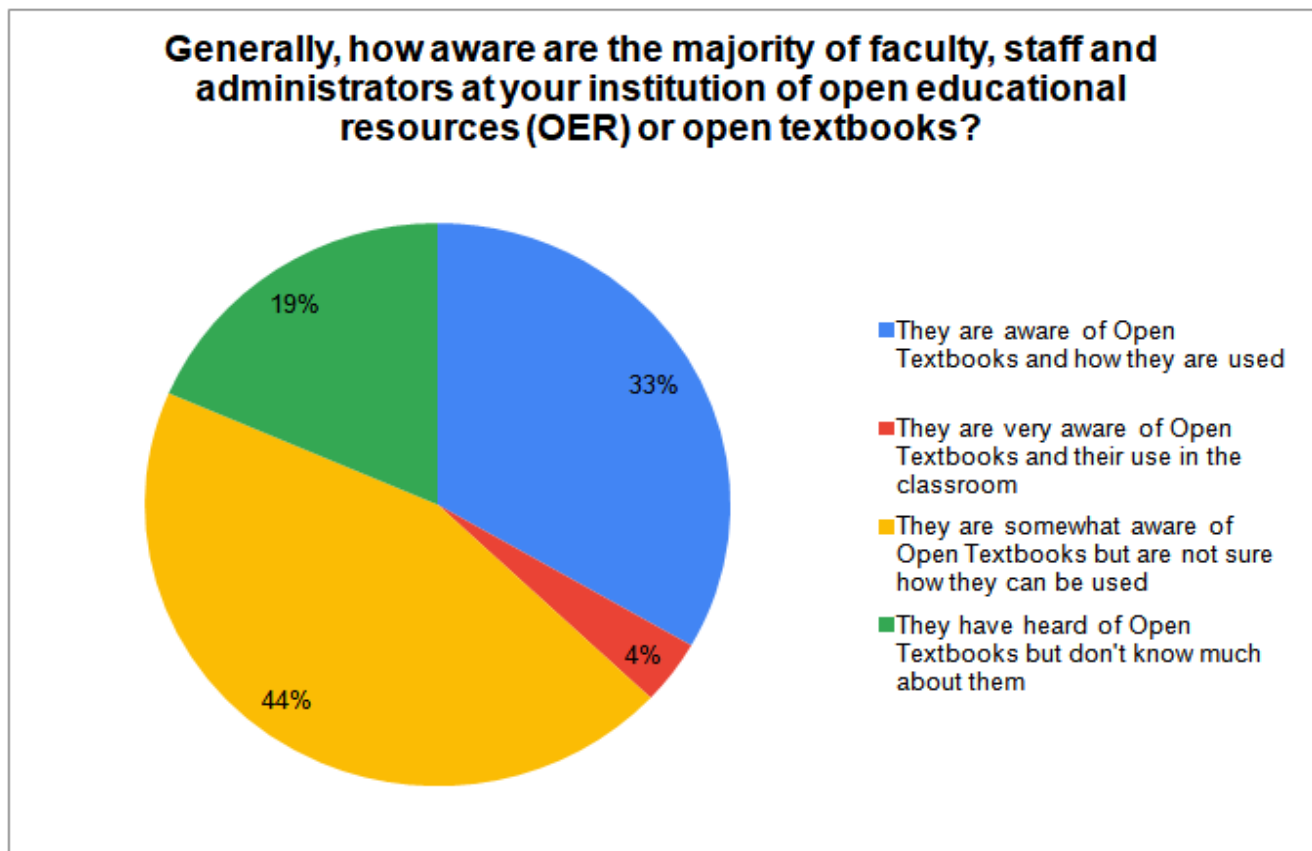


FIGURE 8: Survey responses demonstrating the growth in OER awareness in Colorado.

⁴⁷The Impact of OER Initiatives on Faculty Selection of Classroom Materials: <http://onlinelearningsurvey.com/reports/impactofuerinitiatives.pdf>

This represents a significant increase when compared to 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.

Below is a collection of feedback from various faculty around the state, specifically from those who have participated in the OER Grant program as part of their campus or department initiative.

“Finding appropriate and substantial OER materials for some discipline areas has been difficult, particularly science.”

“We also should address the fact that some faculty use some free to students resources in addition to OER and acknowledge how that is useful for students, but different from OER.”

“We would like to see more collaboration among institutions so we are not duplicating efforts and would encourage funds being earmarked towards statewide adoption of OER textbooks for core courses.”

“OER are saving MSU Denver students money, and in many cases faculty perceive they have also improved student learning outcomes.”

“The need for instructional design support is pressing. The reality is OER adoption involves intense curation of materials and remediation for accessibility.”⁴⁸

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.

⁴⁸ Quotes taken from final reports submitted by OER Grantees in 2021; specifically, from ASU, UNC, ACC, MSU-Denver, and CCD respectively.

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 report⁴⁹:

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.

⁴⁹ Report to the Joint Budget Committee and The Education Committees of the General Assembly Open Educational Resources in Colorado November 2017: https://higher.ed.colorado.gov/Publications/Reports/legislative/OER/OER_Nov2017.pdf

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.

Legislation from 2018

Ultimately, the bill was sponsored by Representatives Rankin and Young and Senator Lundberg. In late April of 2018, [H.B. 18-1331](#) was signed by the Governor. Consistent with many of the recommendations of the Council, this bill appropriated funds for the work of the OER Council including a dedicated FTE from 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 stated as “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.”⁵⁰ 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 within the text of the bill, “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.”⁵¹ 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 the Governor. This bill also appropriated \$1,108,200 to the grant program for the 2021-2022 state fiscal year, with funds allocated for a dedicated FTE 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. ⁵²

⁵⁰ Higher Education Open Educational Resources: <https://leg.colorado.gov/bills/hb18-1331>

⁵¹ Use Of Open Educational Resources In Higher Education: <https://leg.colorado.gov/bills/sb21-215>

⁵² 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 and, in 2020, the third round included \$875,000 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 and 27 in the third 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 Department staff, outlined the structure of the Request for Proposals (RFP) and timeline for the second grant cycle which mirrored the first. To expand reach and compound the grant fund impact in year two, 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 CCHC 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 will be followed for the fourth round of grant funding to be administered in the fall of 2021 (with updates to the content of the request for proposals)⁵³.

GRANT TYPES

1	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 \$10,000-\$100,000
2	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-\$9,999

⁵³ 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. To help address one of these concerns, a project funded by the third cycle of this grant at Colorado School of Mines, the Accessibility Course for Education or ACE, is an OER course designed to help educators learn tools and tricks to enable accessibility in their coursework and fulfil the accessibility requirements of this grant. Two sessions of ACE lasting three weeks each have been facilitated by Mines thus far, with 37 participants representing six public institutions across the state helping build an understanding of accessibility and a sense of community among OER grant receiving institutions. Furthermore, CDHE and several campuses have continued dialogues with national organizations, specifically the Open Textbook Network (OTN), to propose a working group on accessibility in OER⁵⁴. Undoubtedly, these priorities remain intact with the continuation of grant funding, exemplifying the importance of these topics in pursuing the OER initiative.

Year Two Grantees

In year two of the OER Grant Program, 32 project proposals were granted funds to pursue various OER initiatives at their respective campuses. This includes 24 institutional-level initiatives as well as eight small group projects. In addition to these grantees, the OER Council and CDHE decided to fund two institutions by means of providing funds to pursue professional development and statewide training opportunities related to OER specifically. This was a result of the decision to expand the second year of funding to as many campuses as possible, including those who did not receive an award for their initial proposal.

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

⁵⁴ 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.

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 \$2.4 million to the students of Colorado at their respective institutions from the second year grant alone. This number is predicted to increase as further projects are completed to more than \$2.75 million from this second round of funding in the 2021-2022 academic year. The realized student savings represent an estimated 240% return on the State’s initial investment (ROI) into this cycle of the program alone. When accounting for first-year grant projections, the total reported impact is more than \$6.3 million through initial grant-year implementation alone and the actual realized impact is estimated to be more than \$10 million assuming most funded OER adapted, adopted, or created in the first year with the assistance of this grant continued to be used with similar enrollment. The Department estimates no less than 400% ROI for the first two years of this grant program but believes the actual figure to exceed 600% ROI due to year-over year continued use.⁵⁵ 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.

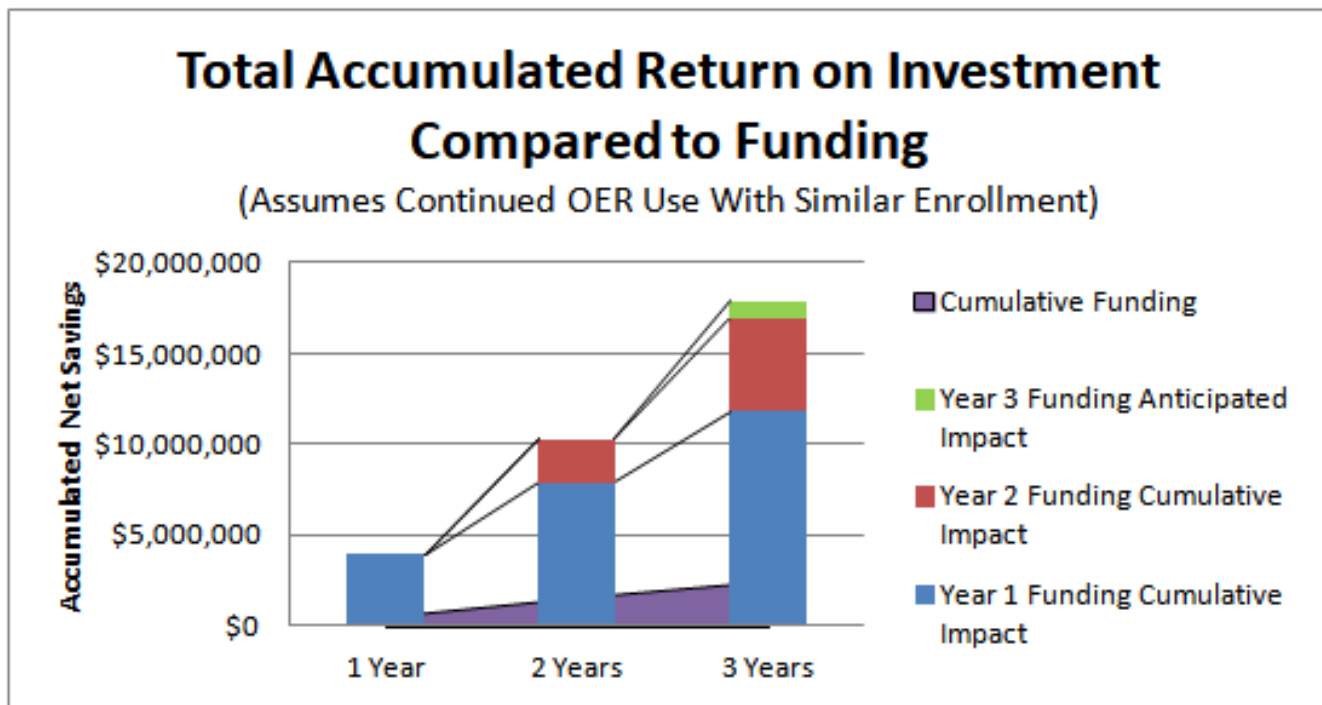


FIGURE 9: Compounded Savings from Grant Funded OER

⁵⁵ Estimates based on aggregate data collected from grantees and aggregated by CDHE Staff.

Year Two Grantee Profiles

This second year of grant funding for OER in Colorado yielded many creative projects from several academic disciplines and differing approaches to facilitation of open education. For example, Adams State University targeted adopting OER in courses in their Correspondence Education Program to improve student success amongst their incarcerated population of students with the aim of reducing recidivism. Colorado Mesa University used funding to build institutional OER capacity through professional development. These two projects represent only a fraction of the varied approaches to OER work from the grantees. Diversity in approach to OER implementation and subject matter expertise has strengthened the initiative, with CDHE providing intentional means for connecting faculty and staff to the current work being done by peers. The vision is for CDHE to continue to serve as a hub for coordinating and communicating efforts of campuses pursuing OER for the next several years. This includes the continued potential of identifying and communicating OER for general education and Guaranteed Transfer (GT) Pathways courses, concurrent enrollment courses, and high enrollment courses, all of which are prioritized in the Grant Program request for proposals (RFP).

Year Two Grant Progress

As noted in the timeline, grantees were required to report on their progress toward goals in July 2020. The institutional grantees were swift in their implementation of their outlined OER projects, with many replacing costly materials for students in the fall 2020 and spring 2021 terms. This attentive and agile response to the OER grant program exceeded the Department's expectations in terms of making an impact on student cost-savings from a short-term perspective. The OER Council and CDHE are planning efforts for sustainable support and approaches to lasting impacts of open education and the proliferation of OER in Colorado. This includes future strategic planning and goal setting, in alignment with the priorities of both the CCHE and State.

The 2017 OER report outlined how many similar statewide initiatives had returned three times the invested funds in cost-saving to students through replacing expensive courses materials and texts. Thus, the OER Council and CDHE articulated a similar ambition in terms of return on the State's investment. Colorado is now projecting to have saved students at least \$6.3 million upon initial grant-year implementation from the first two grant cycles and estimate total savings topple \$10 million over the two years this grant has been implemented thus far⁵⁶. This measure is often cited as a measure for the general financial impact of OER in a scaled approach to the work, so it is a positive measure for both institutions and students in Colorado.

Pursuant to HB18-1331 CDHE and OER Council have documented key metrics, though the grant program and OER initiative are still in nascent stages. In this preliminary reporting stage, several lag metrics cannot yet be reported, but are planned to be measured in future reporting in conjunction with the CDHE's research division. Metrics with current data and projections available include the list on page 17⁵⁷.

⁵⁶ Projections are reported by grantees and aggregated by Department staff. \$10 million dollar total estimated savings presumes continued use of first year grant funded OER at similar enrollment. Various levels of implementation depending on campus approach.

⁵⁷ Primary metrics to inform this list include the reports submitted by the OER Grantees during the 2019, 2020, and 2021 Progress Reports and 2020 and 2021 Final Reports.

Year Three Grantees

At the October 2020 CCHE meeting, the OER Council presented a comprehensive overview of the OER initiative. Department staff, in conjunction with the OER Council, outlined the structure of the Request for Proposals (RFP) and timeline for the third grant cycle and presented it to the Commission. Since then, the Department has collected the next cohort of applications, participated in a comprehensive review period, communicated required revisions to shortlisted candidates, and refined a list of recommendations for CCHE consent at the February meeting, the first of 2021.

The RFP was structured to encourage proposals ranging from professional exploration and development (with a focus on OER) to creation, adaptation, and/or adoption incentives of OER by faculty, staff or administrators in institutions of higher education.

At the close of the RFP in the fall of 2021, there were 39 submissions for the grant, totaling more than \$1.4 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.

Within the proposals for the third grant cycle, 22 were from institutions of higher education for institutional level grants and 17 for small groups or individuals; this also included proposals from 26 different institutions, including 15 community colleges, both urban and rural. 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. In these cases, a replacement reviewer was appointed by Department staff. Department staff made pre-notifications of shortlisted proposals available to applicants in January 2021. This afforded institutions an opportunity for future planning with the understanding that final approval of their grant status would take place at the February 2021 CCHE meeting.

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. With grantees from many institutions including the one additional institution which had not participated previously, the State has reached 87% of eligible institutions who have received OER grant funds from this program. Preliminary projections of student cost-savings from this cohort are showing at least a 100% 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 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 GTPathways 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.

58%

of students indicated textbook costs impacted which and how many classes they took

98%

of students liked that the OER material was free

39%

students sometimes or often went without the required course materials

93%

of students thought the OER textbook was the same or better than the traditional print textbook

63%

of students think open resources are as high of quality as publisher provided resources

82%

responded they used the OER textbook about the same or more than the traditional print textbook

89%

of students are interested in taking classes that use OER materials

80%

did not print the textbook

78%

of students liked or really liked the OER textbook

58%

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

In 2021 Arapahoe Community College once again surveyed students on their experiences with OER which yielded the following selection of quotes from their report:

“I liked the readability features in the online textbook, I liked that I could change how the textbook looked to fit my needs.”

“So far most of the textbooks I've read were for high school. This year I ended up doing a lot of textbook reading for my high school history class. The language and content of that textbook was very basic surface level and incredibly uninteresting. The OER textbook was far more informative and gave a more in-depth conversation. So I think the OER textbook was better than the traditional textbook.”

“In the format I received [the OER], it was split up into segments that were more easily digestible and navigable than a textbook.”

“The OER textbook allowed for quick and easy access to any information. A great tool was the notes section.”

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.

The below summary of the 2021 grantee survey documents this trend in further detail.

Survey Results & Analysis

In 2020, first-year 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. The survey was completed by institutional OER grant administrators as part of a data collection effort. In 2021, institutions were again surveyed via OER Grantees to both assess progress and inform future decisions with regard to Open Education and OER in Colorado. Themes gleaned during a review of the 2021 survey reveal the following trends.

Metrics with current data and projections

Specific Metric	Measures from 2020 Report	Updated Measures from 2021 Report
Estimated amount of student savings that resulted from using the open educational resources	Preliminary aggregated cost-savings to students were projected at \$1.6 million statewide as a result of second year grant-funded OER , an additional \$1.6 million for non-grant funded OER usage, ⁵⁸ and \$3.9 million from first-cycle funded OER. Accounting for only initial year implementation from each of these grants, this represents at least a three and a half times return on the State's investment into the institutions of higher education, neglecting the impact year one grant OER will have on student savings beyond the initial implementation.	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 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 (25/30 eligible public institutions ⁵⁹), number of Open Education Ambassadors trained to further OER efforts in their communities (124 representing 27 different institutions) and number of courses addressed (398) as well as student enrollments impacted (41,273) by this initiative including grant cohort 1 and projections from cohort 2.	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 ⁶⁰) 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 ⁶¹ .
Number of students affected by open educational resources	Preliminary aggregated student enrollment for OER courses utilizing grant funding total 41,273 statewide. Additionally, non-grant	Preliminary aggregated student enrollment for OER courses utilizing grant funding total 63,809 statewide. Additionally, non-grant

⁵⁸ Primary methodology for calculating cost-savings to students is reported as the cost of course materials replaced multiplied by the number of students enrolled.

⁵⁹ Number has been revised from the previous report to more accurately represent eligible independent institutions and grant recipients.

⁶⁰ 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.

⁶¹ Aggregated data assumes OER from the previous cycle remain in use with similar course enrollment.

	funded OER courses reported by institutions on a voluntary basis include an additional 8,109 enrollments for a total of 49,382 enrollments overall.	funded OER courses reported by institutions on a voluntary basis include an additional 14,921 enrollments for a total of 78,730 enrollments overall.
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;	In the 2020 report there was an increase in institutions adopting OER policies. In 2017, 0% of survey participants reported having institutional OER policies. In 2020 8% of grantees reported having policies in place regarding the use, publication or implementation of OER while another 28% mentioned their institution currently working on creating a policy or including OER in other ways i.e. master plan. 2020 grantees also reported that 100% of faculty, staff, and administrators at their institution have at least heard of OER and 28% are "aware" or "very aware." Also, only 4% said their campus and administrators were not actively adopting OER support programs, while 64% were somewhat actively, or actively adopting OER support programs.	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 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.
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;	In the 2020 final report 15 grantees reported 1-33% of campus courses using OER. 3 grantees said between 21-33%, 2 between 11-20%, and 10 between 1-10%.	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. ⁶²
The open educational resources created and shared by grant recipients;	As of the 2020 report, the CDHE had begun the process of creating a central referatory which will document the course materials adopted, used, or created by grantees.	The referatory is up on the CDHE OER homepage ⁶³ 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 ⁶⁴ .
For public institutions of higher education that receive a grant or that employ faculty or staff that	Upon receiving the Grantee Final Reports for the first cohort, only two campuses were able to report	Though more grantees (14) were able to report on such metrics, and outcomes generally skewed toward

⁶²Several 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.

⁶³ CDHE OER Homepage Available at: <http://masterplan.highered.colorado.gov/oer-in-colorado/>

⁶⁴ Referatory currently available at: <https://docs.google.com/spreadsheets/d/1YbvFA-xQm9Q23dHFYeRdkeDYo5SRkuySgpCC4IXbQNM/edit#gid=1251208961> .

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

on such metrics. **Both campuses reported marginal increases or no negative changes in student success metrics⁶⁵.**

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.⁶⁶

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. The Pandemic has continued to be a unifying challenge for all involved. CDHE is working tirelessly to maintain a responsive, stakeholder informed approach to support OER Grantees during this time and will continue to do so during the forthcoming recovery.

⁶⁵ PCC reported a .3% increase in pass rates for their summer OER course while PPCC reported 1% increased in DFW rates for two courses.

⁶⁶ 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.

Statewide Training and Development Activities

Over the course of the last two 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. In the last grant cycle, CDHE administered more than 20 trainings, reaching hundreds of professionals and addressing topics such as innovative approaches to learning technologies, inclusive pedagogical practices, and further guidance on OER implementation at the classroom level. All of the training sessions, workshops, and conferences have been archived for future reference via Google Docs, YouTube, and other sharing platforms.

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.



FIGURE 10: Governor Polis' Proclamation of Open Education Week in Colorado

Open Education Week

In the third year of CDHE’s contributions to this global event, growth in local participation grew for Open Education Week or OEWeek. OEWeek is a global interactive, week-long event established in 2013 to “raise awareness and showcase impact of open education on teaching and learning worldwide.” In collaboration with many from across the state, the OER Council hosted several professionally focused activities, beginning with [Open Education Week](#) (OEWeek) in March of 2019, 2020, and most recently 2021. During this week, national and local experts highlighted practical implementation workshops as well as strategic-level sessions as an offering to staff, faculty and administrators in Colorado. Over the past two years, all activities were recorded and archived on the [Department YouTube channel](#) for future utilization and access.

During OEWeek, the CDHE curated a variety of presentations, while local campuses acted as presenters and subject matter experts (while also conducting their own activities for local audiences). Additionally, the Governor issued an official proclamation for Open Education Week in Colorado, completing a comprehensive, multilayered approach to the week’s activities, which both symbolized and embodied the nature of Open Education.



Faculty & Staff Training

As designated by the legislative budget allocation associated with this initiative, the Department gained membership with the [Open Education Network](#) in March 2019 and has maintained that membership to the benefit of all institutions of higher education in the state. This affiliation in turn led to the first statewide training with this organization in May of 2019, and seeded further participation for activities in October and June of 2020. This training served as the foundation for the Open Education Ambassadors introduction to Open Education. More than 120 ambassadors engaged in these sessions, which aim to continue scalable OER implementation, as part of the launch of the Department's [Open Education Ambassadors](#) program. The ambassadors are now representatives who have the capacity and knowledge to train other faculty and staff on their campus to help expand the use of OER in various parts of the institutions. Ambassadors receive ongoing support and training from CDHE to continue to build a network of support and capacity for scaling OER throughout the institutions of higher education. In the two cohorts, representatives from public, private, two-year, four-year and technical schools attended the training.



FIGURE 11: Faculty and staff at Open Education Ambassadors training.



2021 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.

Staff & Council Recommendations

In 2021, 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)⁶⁷. 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.

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.

⁶⁷ For award profile, or visit: <https://wcet.wiche.edu/initiatives/wcet-awards/wow/media-release-2019>.

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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: Homepage for *Cases on leadership in Justice and Equity in Higher Education*

Source – University of Colorado, Denver

FIGURE 3: Image of the Affordability Roadmap

Source – Colorado Department of Higher Education

FIGURE 4: Master Plan Goals from the CCHE & CDHE

Source - Colorado Department of Higher Education

FIGURE 5: Image from the #NoLapseInLearning campaign

Source – Colorado Community College System

FIGURE 6: Image from the student campaign with CSGC

Source- Colorado Student Government Coalition; screenshot from CDHE website

FIGURE 7: Word cloud and sticky note responses documenting students' competing

Sources – Grantee reports from University of Northern Colorado, Community College of Denver, Aims Community College and University of Colorado

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

FIGURE 10: Governor Polis' Proclamation of Open Education Week in Colorado

Source- Colorado Department of Higher Education

FIGURE 11: Faculty and staff at Open Education Ambassadors training

Source- Colorado Department of Higher Education

FIGURE 12: Attendees at OER conference. From right to left: Representative Larson, Congressman Neguse, Representative McCluskie, Chancellor Garcia, Governor Polis, Executive Director Paccione, and OER Council members

Source- Colorado Community College System



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