



COLORADO RISES:

# Transforming Education Practices

*through Open Educational Resources*



**2020**

**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  
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under the Executive Leadership of Dr. Angie Paccione  
Pursuant to the statutory authority of §23.-4.5-103

October 2020

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Jared Polis  
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Data 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 **Open Educational Resources (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 **\$3.9 million in cost-savings for students**. That figure represents **an astonishing sevenfold return on the State's investment** in OER and is clear evidence of the dedicated efforts of the higher education institutions' faculty and staff.

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**. CDHE supports institutions of higher education in their relentless pursuit of innovation through OER centered trainings, workshops, and conferences, as 96% of eligible institutions have received funding from the CDHE OER Grant Program.

In 2020, the Department laid out its Roadmap to Affordability for learners in Colorado, reaffirming its commitment to OER. After two years of this work, CDHE's effort to build capacity and support **has created a statewide ecosystem for successful OER implementation** with more than **50 grantee projects** and more than **120 trained Ambassadors** championing work at the campus level.

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.

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

For the entire world, 2020 has been a generation-defining year. With millions of students and families impacted by school closures and changes to operations, the global community has felt the impact of the COVID-19 Pandemic as educators and governments attempted to mobilize solutions for meeting students' ongoing needs. 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 in Colorado. Impressively, institutions of higher education worked hard to provide students with high quality learning experiences despite the need for rapid change; this includes through further exploration of Open Educational Resources (OER) and practices.

Though the role Open Education (OE) and Open Educational Resources (OER) has been a priority for the Colorado Department of Higher Education (CDHE) since 2018, the proliferation of OER during this time of online learning was accentuated; proving an invaluable strategy for providing more affordable, high-quality, accessible, and equitable learning materials as well as approaches to instruction. With respected entities such as UNESCO calling for the expanded use of open education applications to help maintain access for students learning remotely<sup>1</sup>, Colorado stood proud to champion Open Education and OER as key components to best serve students and educators in this time of uncertainty. OER is a key step in the Department's so-called Roadmap to Containing College Costs and Making College Affordable<sup>2</sup>.

Containing costs for students in higher education remains important to the Colorado Department of Higher Education (CDHE) and the State of Colorado. Although data suggest that earning a postsecondary credential improves individual earning potential and offers robust return on investment<sup>3</sup>, 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 2008<sup>4</sup>. To this end, CDHE is building capacity for wide-scale implementation of open educational resources (OER), which, according to state definition, are free or very low-cost teaching and learning materials that live in the open domain. 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](#).

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.

<sup>1</sup> 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>

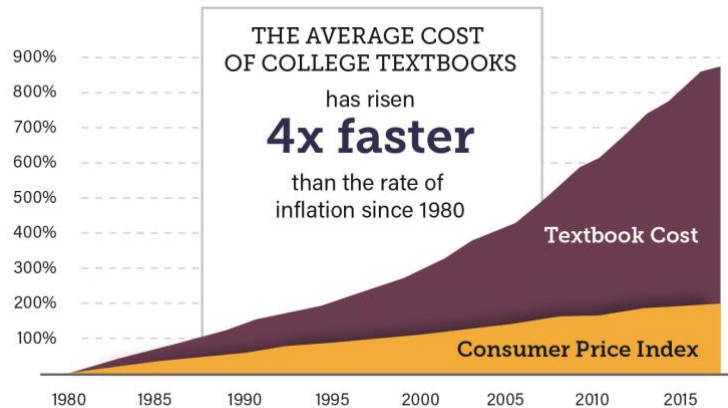
<sup>2</sup> CDHE Roadmap to Containing College Costs: <https://highered.colorado.gov/Publications/Reports/Roadmap-to-Containing-College-Costs-and-Making-College-Affordable.pdf>

<sup>3</sup> CDHE Annual Return on Investment Report: [https://highered.colorado.gov/Publications/Reports/Legislative/ROI/202008\\_ROI.pdf](https://highered.colorado.gov/Publications/Reports/Legislative/ROI/202008_ROI.pdf)

<sup>4</sup> 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>

As emphasized in the above, 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 inflation<sup>5</sup>. National organizations, the state of Colorado and Colorado institutions of higher education estimate that college students should budget anywhere from \$900 to \$1,800 for books and course materials in the 2018-19 academic year<sup>6</sup>.

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 higher education.

In the first year of the OER Grant Program, institutional grantees are reported savings of more than \$3.9 million to the students of Colorado at their respective institutions. This figure represents more than six times the return on the State's initial investment into this initiative<sup>7</sup>. Moreover, these savings are calculated by institutions of higher education over the course of one academic year, meaning students in Colorado could continue to save this amount of money with continued use of OER year-over-year. Truly the potential for OER in Colorado is outstanding.

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. The current state of the open education movement in Colorado is radiant, and the potential is just as bright.

<sup>5</sup> US PIRG Open 101 Report: <https://uspig.org/news/usp/release-new-report-open-101>

<sup>6</sup> 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://highered.colorado.gov/Finance/FinancialAid/Policy/2018-19-Student-Budget-Parameters.pdf>. Campus websites such as <https://www.csupueblo.edu/student-financial-services/cost-of-attendance.html> and <https://finaid.mines.edu/Cost-of-Attendance-Undergraduate/>.

<sup>7</sup> The total allocation for grant monies in the first year of the OER grant program were nearly \$550,000 and are further detailed in the budget and institutional profile sections of this report.

## Key Findings

Over the last two 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 \$3.9 million in student savings from \$550,000 in grant funding<sup>8</sup>—a nearly seven-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 first grant cycle; that number is expected to persist and grow year-over-year.
- In the first year, grantees addressed over 100 courses, reaching over 30,000 enrolled students with OER materials from the Grant Program.

2

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

Key Performance Indicators:

- Several OER grantees have reported specific data demonstrating improvements or no negative impact to student learning and outcomes as a result of OER implementation<sup>9</sup>; with various campuses citing increased student engagement or enthusiasm when open education pedagogical are employed by instructors<sup>10</sup>.
- 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 OER<sup>11</sup>.

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:

- 96% of eligible institutions have received funding from the CDHE OER Grant Program<sup>12</sup>, signaling both a great interest in this field, and an effort to build statewide collaboration<sup>13</sup>.
- Over 120 faculty, staff, and advocates have been trained through the Open Education Ambassadors program, with over 1,250 registered to attend the June 2020 OER Virtual Summit.

<sup>8</sup> Total amount of estimated cost-savings for students is an aggregated total tallied from the final reports of grantees from cohort one and includes the summer 2019, fall 2019 and spring 2020 terms. See appendix for charts.

<sup>9</sup> Data reported by PPCC and PCC in progress reports from 2019, and FRCC in final report from 2020.

<sup>10</sup> See Community College of Denver case study.

<sup>11</sup> See survey result section in appendix; results when compared against initial 2017 survey.

<sup>12</sup> Only two community colleges have not applied directly for funding; all other eligible institutions have received funding in either the form of a grant or professional development funding in the first two years of the program, either directly or as part of system-wide initiatives.

<sup>13</sup> Note: several system or inter-institutional grant initiatives have been funding in the first two grant cycles.

# COLORADO OER DASHBOARD

## Grant Cycle: Year 1

INVESTMENT OF  
**\$550,000**

awarded in grant cycle year one.

Return on investment goal

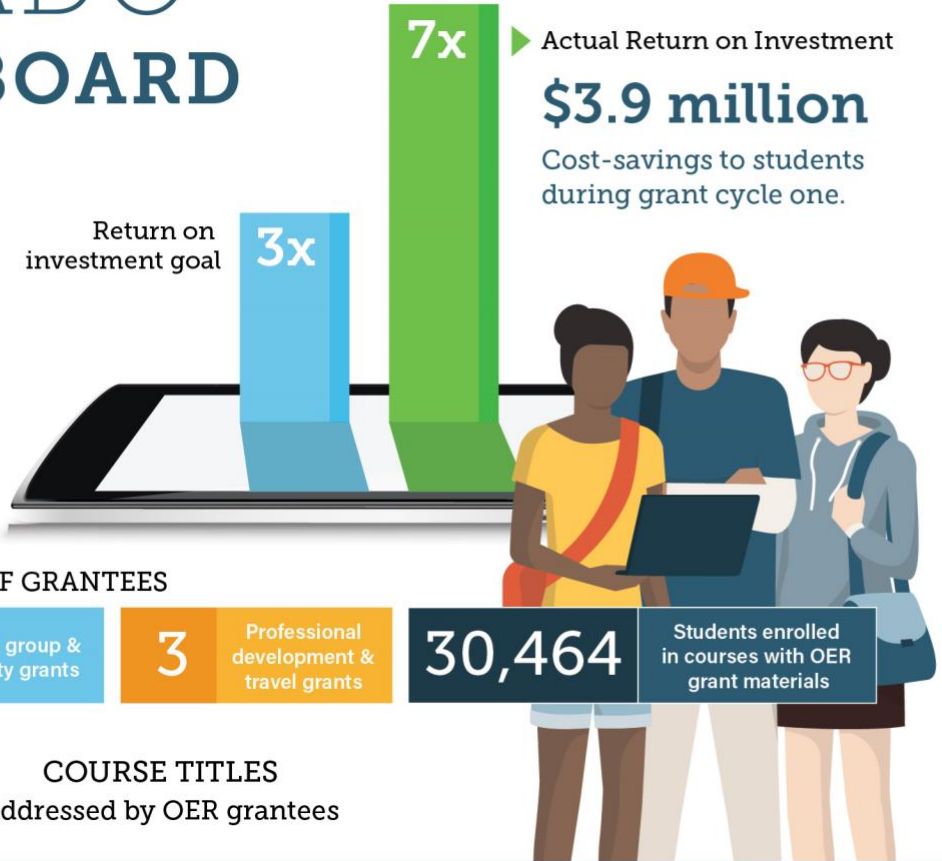
3x

7x

Actual Return on Investment

**\$3.9 million**

Cost-savings to students during grant cycle one.



### 2019 NUMBER OF GRANTEES

15

Institutional grants

5

Small group & faculty grants

3

Professional development & travel grants

30,464

Students enrolled in courses with OER grant materials

**100+**

COURSE TITLES Addressed by OER grantees

## Grant Cycle: Year 2

INVESTMENT OF  
**\$1 million**

awarded in grant cycle year two.

### 2020 NUMBER OF GRANTEES

22

Institutional grants

10

Small group & faculty grants

2

Professional development & travel grants

**205**

COURSE TITLES Addressed by OER grantees

Colorado OER received the nationally competitive WOW Award

**15**

OER Council members representing 12 institutions and 2 state agencies steering the OER work in Colorado.

**127**

Open Education Ambassadors were trained in year one

*Representing 35 different 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 trainings, offered both virtually and in-person, the CDHE and OER Council have fostered support through professional development. This includes national and international engagement collaborations<sup>14</sup> providing those in Colorado with additional personal development opportunities.
- **Next Steps:** Partner with national entities such as the Creative Commons and Open Education Network to build sustainable partnerships 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 projects<sup>15</sup>.
- **Next Steps:** Explore campus-level policies such as inclusion of OER in tenure and promotion criteria while supporting administrative initiatives with campus leadership.

*"I shouldn't have to be held back in a class because of an expense. My education should come to me not necessarily free, but easier than it is right now."*

- AIMS COMMUNITY COLLEGE STUDENT

<sup>14</sup> 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.

<sup>15</sup> 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 innovation education.

- **Progress:** In addition to granting over \$1.5 million to institutions for OER initiatives, the CDHE OER Council have organized over 20 trainings and workshops for faculty and staff while also adapting a self-paced *Zero Textbook Cost & Equity*<sup>16</sup> 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 comprehensive vision of Open Education.

CDHE and the OER Council must continue to foster a statewide community to meet their goals of 100 percent 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 quarter of grantees said colleagues at their institutions are “aware”, or “very aware”, of open textbooks and how they are used<sup>17</sup>.
- **Next Steps:** Continued, focused, intentional effort to target campuses that have not yet signaled interest or engagement with the statewide OER initiative.

## 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 Grantees<sup>18</sup>, several data points indicate a positive impact on higher education through the work of the OER Grantees; most notably over \$3.9 million savings for 30,000 enrolled students in Colorado.
- **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 individual in classrooms around the state.

<sup>16</sup> As part of *Governor Polis' ZTC Challenge*, see course at: <https://lor.instructure.com/resources/0530de6019704726a00ae6b3947113b0>.

<sup>17</sup> Based on survey results from 2017 and 2020; see appendix.

<sup>18</sup> 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.

In addition to the OER Council and institutional recommendations, the 2020 Grantee Reports and Survey indicate further recommendations for the CDHE to pursue in moving the Open Education initiative forward for the State of Colorado. These include further supports for institutions in the creation and adoption of OER, identifying and differentiating OER and other low-cost or Zero Textbook Cost initiatives, and a tangential recommendation of enabling broadband internet for all as a basic, underlying infrastructural necessity for all learners<sup>19</sup>.

## 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 potential<sup>20</sup>. Thus, containing costs is essential to expanding opportunities and addressing the needs of Coloradans.

*"Students would benefit from free textbooks because it would be a big burden off our backs. I've experienced not having a book on time because I didn't have the funds and it put me behind in class. Making textbooks free would be a very helpful thing to students."*

- COMMUNITY COLLEGE OF DENVER STUDENT

### 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 practices<sup>21</sup>. 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. The 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.

In effort to promote further implementation of OER for equitable pedagogical approaches and teaching practices, the CDHE and OER Council organized professional development opportunities for Colorado educators to learn more about this movement. During Open Education Week 2020, the CDHE hosted a workshop entitled *Beyond Free: Supporting Social Justice through Open Educational Practices*, in which novel practices in promoting social justice and equity were shared by international experts. The presentation was attended by dozens of educators and has been archived on the OER website and viewed by dozens more<sup>22</sup>.

<sup>19</sup> See survey results in appendix for more.

<sup>20</sup> "Colorado Department of Higher Education's Annual Return on Investment Report": [https://highered.colorado.gov/Publications/Reports/Legislative/ROI/201907\\_ROI.pdf](https://highered.colorado.gov/Publications/Reports/Legislative/ROI/201907_ROI.pdf)

<sup>21</sup> OER and OEP for Access, Equity, Equality, Quality, Inclusiveness, and Empowering Lifelong Learning: <https://www.ijoer.org/oer-and-oep-for-access-equity-equality-quality-inclusiveness-and-empowering-lifelong-learning/>

<sup>22</sup> Presentation available at: [https://www.youtube.com/watch?v=Sx8N1P\\_leEs](https://www.youtube.com/watch?v=Sx8N1P_leEs)

## Governor Polis Zero Textbook Cost Challenge

Following the momentum of the first year of OER Grants, the CDHE launched Governor Polis' Zero Textbook Cost Challenge<sup>23</sup> in effort to expand the number of faculty, departments, and academic pathways that include only freely available course materials for their students. Such initiatives inspired the term “zero textbook cost” or “z degrees” as shorthand for dedicated classes and academic pathways. Zero textbook cost initiatives and implementation of OER are an excellent strategy for addressing equity in higher education, by increasing access and affordability. As the OER movement continues to grow, data around the country suggests such practices are saving students money and improving their educational outcomes. Studies demonstrate an increase in course grade and a decrease in withdraw rates when professors adopt open education in the classroom<sup>24</sup>.

The CDHE and OER Council jointly adapted and co-created an advanced OE professional self-paced training course entitled “ZTC + Equity + Pathways for Colorado<sup>25</sup>”, as part of Governor Polis' Zero Textbook Cost Challenge. This course explores the fundamental connections between Equity, OER, Guided Pathways, and Zero Textbook Cost (ZTC) programs. The aim is to aid educators in understanding how OER supports equity and guided pathway efforts with the Departmental goal of equipping campuses with resources to advance their ZTC and OER efforts. Local champions for OER and open pedagogical practices have highlighted how the OER activities promoted by the CDHE have directly supported their local equity efforts<sup>26</sup>. Additionally, the Governor will recognize outstanding ZTC faculty, staff and programs with awards in Colorado in the fall of 2020<sup>27</sup>.

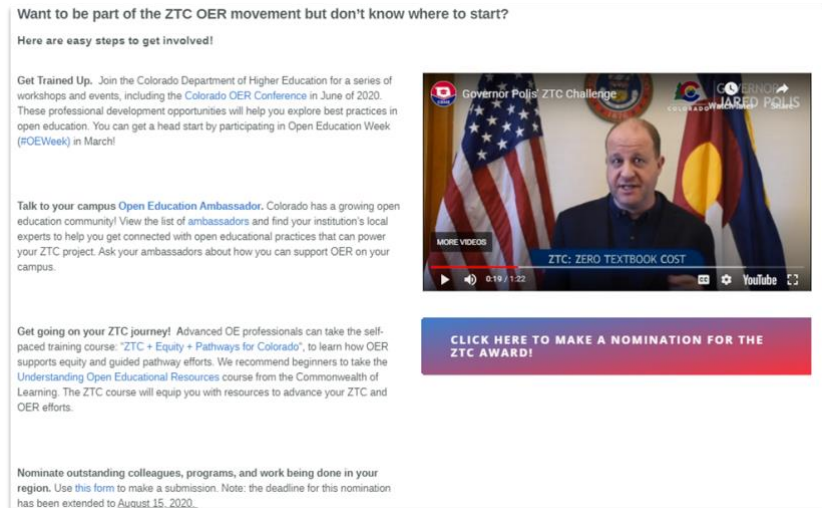


FIGURE 2: Screenshot of Governor Polis' ZTC Challenge webpage

<sup>23</sup> Learn more at: <http://masterplan.highered.colorado.gov/governor-polis-ztc-challenge/>

<sup>24</sup> Read studies by SPARC, University of Georgia, California Community Colleges, CDHE OER Council Report.

<sup>25</sup> Adapted from origin course created by California Community Colleges in 2019.

<sup>26</sup> Faculty from several campuses presented during the OER Virtual Summit on their approaches to open pedagogy.

<sup>27</sup> Nearly 30 individuals, departments and programs were nominated in the first year of the challenge.

## Case Study: Community College of Denver - Business Law

After receiving a grant in 2019, the Community College of Denver funded several local initiatives including multiple faculty OER development projects. One such project within this Grantee's portfolio included the conversion of a business law course resource into an OER. The grant accelerated years of efforts by local faculty to create a high-quality business law OER, in collaboration with hundreds of contributors from students to subject matter and academic experts. The end product, *Fundamentals of Business Law*<sup>28</sup>, was published in the fall of 2019 and promptly added to the national Open Textbook Library, a national archive of freely available, high-quality OER. According to the Grantees, this book has already saved students at CCD an estimated **\$144,000**<sup>29</sup>. That number should continue to grow year-over-year with the continued use of this textbook.

In recounting the process of co-creating this OER in collaboration with law colleagues and students at the Community College of Denver, Professor Melisa Randall explained the following highlights regarding the project:

*"This is an open pedagogy<sup>30</sup> project in which undergraduate business students edited, revised, and improved chapters in the OER textbook to ensure effective delivery to undergraduate business students. They even created graphics to convey the information in visual forms.*

*We asked professionals across disciplines to contribute their expertise to our book. Judges and attorneys provided practical advice to business students on how to avoid legal liability and maximize their success. Business professionals across disciplines peer reviewed chapters and gave us real life examples and applications of the legal principles in today's environment.*

***As an open pedagogy project, we have seen deeper learning, comprehension, and application of legal principles by our students. The retention rate has improved, as well as student performance. We have documented a 2.11% increase in final course grades across sections; with the number of "As" increasing from 38% to 46.4%.***

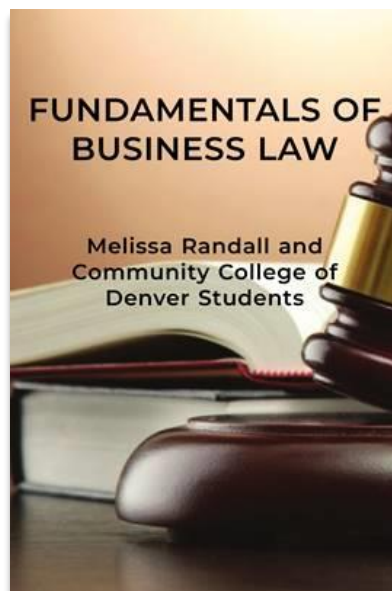


FIGURE 3: Fundamentals of Business Law textbook by M. Randall & CCD Students

<sup>28</sup> OER available at: <https://introductiontobusinesslaw.pressbooks.com/>.

<sup>29</sup> Estimated cost-savings reported by CCD.

<sup>30</sup> Open pedagogy is an inclusive teaching practice in which the students are engaged as creators of information rather than simply consumers. It's a form of experiential learning in which students demonstrate understanding through the act of creation.

*This increased success rate occurred during a time when we made the course more rigorous, countering our prediction of student performance. For example, we teach students how to read and analyze complete judicial opinions rather than heavily edited summaries found in most traditional textbooks. We have built our undergraduate business law class to be 100% OER as part of our initiative to convert our business department to OER over the next few years.*

*On a more personal note, this textbook started in a fit of desperation because the traditional textbooks we tried were not meeting the needs of our students. I spent so much time correcting the legal errors in the [traditional] textbooks and trying to build up my students who felt their failure was predetermined. I needed, and my students deserved, to spend their class time and tuition money on learning the law that would help them during their careers. I started by substituting the heavily edited cases from the textbook with complete judicial opinions and jury instructions. Our project took off from there. Open pedagogy was more of a practical solution than an intellectual concept for me. I needed my students to do some of the heavy lifting and to give me feedback about what worked and what was still confusing.*

*The last three years my students and I wrote a textbook to tackle the problem of connecting the dots between the OER resources we were using during class. My students have blown me away. They more than rose to the challenge and I saw students who started my class intimidated becoming confident, articulate students who took ownership of the material. Several have shared that they are interested in law school and pursuing educational goals that they thought were beyond them. Now instead of counseling my students not to give up, I spend that time dreaming with them. That has made all the hours and work worthwhile.*

***I have had at least half a dozen students this semester tell me that not having to buy a textbook kept them enrolled in my class. They can't afford to cover necessary bills, and textbook and course materials are "luxuries" that are beyond their means right now."***

Since publishing this textbook, this instructor has:

- been contacted by instructors from 6 states, who have reported adoption of the textbook, including teachers in CO, TX, CA, AR, MI, & MD.
- tracked at CCD estimated student savings of \$1.2 million so far.
- Created and shared auxiliary materials along with the corresponding PowerPoints to explain and give examples of the concepts in the textbook.
- Ensured and showcased the true accessibility of the textbook with peers.

Per the requirements of the Colorado OER Grant, the textbook was published with a CC BY 4.0 license to allow for maximum adaptation and use by other instructors and students. This case is an outstanding example of the potential impact Open Education and OER provide learners in Colorado. The CDHE applauds the efforts of these faculty at CCD and all Colorado OER Grantees for the amazing work they pursue to propel innovation and affordability of higher education in the state.

## Case Study: Multi-Institutional Approaches

Of the grantees selected over the course of the last two years, several have taken a multi-institutional approach to their work; meaning their efforts transcends campuses, leaning on the local needs and expertise of each community. Such approaches include collaborations among the University of Colorado System, as well as the Community College System, both of which have intentionally set forth on building a project that serves the needs of the local community, with a vision toward collective impact. This type of approach is encouraging for many reasons, and has demonstrated the strength of collaboration while helping to individual campus needs. The below contains excerpts from the two grantees reports, which demonstrates some of the success and challenges of a multi-institutional effort.

### **CCCS WeBWork Consortium: A Collaborative Data Source for Math Instruction**

“There has been an increased interest in affordability and the desire to implement open educational resources and open pedagogical practices into a broader selection of courses, due to the State of Colorado’s OER initiatives. Therefore, this project proposes expanding the infrastructure of WeBWork so that it may be successfully implemented at any Colorado Community College System College and to further the math curriculum problem set offerings. In the 2018-19 academic year, 12,560 students were registered in MAT 121 across CCCS. Based on conservative estimates of textbook and homework platform fees, as well as steady enrollment, an expansion of WeBWork to all CCCS institutions would save students in MAT 121 a projected \$1.2 million per year.

WeBWork is an open-source online homework platform for math and science, which allows institutions to deploy a high-quality assessment environment that is free to students. WeBWork was created by educators, is endorsed by the Mathematical Association of America and the National Science Foundation, and is used in over 1000 institutions around the world.

WeBWork was chosen for this project based on the successful pilot at RRCC, CCD, and CCCOnline, and for increased interest from around the state. Following this pilot, ten of the thirteen colleges in CCCS have expressed some level of interest in using WeBWork in their math departments. WeBWork also has the support from the Mathematical Association of America and OpenProblemLibrary, which features more than 35,000 problems reviewed by the OPL Editorial Board. WeBWork is stable, internationally renowned, and was awarded the 1999 International Conference on Technology in Collegiate Mathematics Award for Excellence and Innovation with the Use of Technology in Collegiate Mathematics, as well as numerous National Science Foundation grants<sup>31</sup>.”

### **Open CU: Expanding a Successful OER Initiative**

“The University of Colorado System developed a program that continued and significantly expanded its Open CU initiative, which received funding the previous year from the CDHE. The four campuses have worked together over the past several years to establish the community and infrastructure necessary to support scaled awareness and adoption of open educational resources (OER). In 2019, with state funding and our multi-campus team efforts, OER integration flourished in multiple disciplines and in such diverse areas as Urban Studies, English, Finance, and Global Health. Over 140 faculty members participated in workshops and

<sup>31</sup> Excerpt from the CCCS Grant Proposal for Cohort #2.

online, self-paced tutorials to discover and evaluate OER, and 42 of those have incorporated OER into their courses in the fall 2019 and spring 2020 semesters.

Nearly 2,000 students have been impacted by these efforts, realizing well over \$100,000 in savings in the cost of course materials. This extended Open CU program represents the University of Colorado's continued commitment to reducing barriers to OER adoption. This program has provided rich learning opportunities and financial incentives for educators who **adopted, adapted, and created** OER; it has also expanded **recognition** efforts; developed a new focus on **high school concurrent enrollment courses**; provided more opportunities for educators to **share** successes and challenges; and made strides toward the long-term **sustainability** of Open CU by integrating an OER mindset and ethos into the culture of the University.

All four campuses implemented a two-phase, incentive-based OER awareness and adoption program for educators as follows:

**CU Boulder Campus** - Fifty-one educators completed the awareness program that included a workshop and submission of an OER textbook review, and nine educators completed the adoption program that included one all-day workshop, two consultations with the OER Leads, adoption of OER into a Spring 2020 course, and a portfolio. CU Boulder also met goals for student financial savings and access by impacting 536 students with course OER implementation across 14 sections, for a total estimated cost savings of \$39,845.

**CU Denver Auraria Campus** - OER Jumpstart Faculty awareness sessions involved 31 faculty in the following content: background and discussion on the open education ethos; copyright/creative commons information; the worth of OER in fostering quality teaching and learning; OER discovery and evaluation practice; and group sharing of challenges and discoveries. Community of practice sessions involved 12 faculty with specific plans to adopt/adapt or create OER within the grant period, or in the near future and centered around intended projects as well as future work in adopting open teaching tools and potential OER creation.

**UCCS Campus** - Thirty faculty members completed the self-paced OER Pathway tutorial, in which they learned about how to identify OER resources, Creative Commons licensing, and rubrics for evaluating OER; and searched for and evaluated OER for potential use in their courses. Nine faculty members elected to adopt OER in their courses and spent the summer and fall curating those resources and redesigning their courses to be taught in the fall and spring. OER were adopted and implemented in 9 courses serving some 430 students with an overall savings of \$44,000 in course materials, with some of these courses being high enrollment, high DFW rate, and high textbook cost courses.

**CU Anschutz Medical Campus** - Thirty faculty members attended two 90-minute OER workshops that introduced concepts and practical knowledge on finding and evaluating OER, copyright and licensing issues, and instructional design tips for incorporating OER in course curricula. Twelve faculty members advanced to phase 2 of the program, where they were tasked with exploring OER availability specific to their disciplines and adopting OER in their courses when applicable or planning the development of OER resources when not available, affecting 740 students and realizing a savings of over \$9,000. Faculty shared their progress through regular community-of-practice meetings leading to fruitful cross-departmental conversations as well as more in-depth understanding of OER<sup>32</sup>."

<sup>32</sup> Excerpt from the CU System final grant report for cohort #1.



These two outstanding examples of multi-institutional collaboration demonstrate the high impact a collaborative effort may have within, but they are not without their challenges. Most evident to the Department staff is the need for a more sophisticated data and reporting system to help measure the impact of the OER implementation beyond the student cost-savings, as is discussed in the proceeding sections of this report. Department staff have identified a goal of developing a data collection framework that would address these campuses needs, and given the State a more comprehensive picture of the impact that Open Education has with regard to measure related to student learning, faculty course design, pedagogical practices and other dynamic aspects of this initiative. Collecting feedback from current grantees helps the Department shape the revision of the Open Education agenda from the State level perspective, to inform both immediate and long-term needs to sustain and nurture this work for improving student success and faculty innovations throughout Colorado.

## 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 study<sup>33</sup>, 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 decrease 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 percent 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 textbooks<sup>34</sup>.

In 2019, two Colorado OER grantees that had implemented OER in place of commercial textbooks reported no negative impact on student success measures. Both Pueblo Community College (PCC) and Pikes Peak Community College (PPCC) quickly replaced costly textbooks with grant-funded OER options in summer courses with no negative consequences to student success<sup>35</sup>. Those trends seemed to continue with regard to the following terms as both institutions reported impressive cost savings for students, as well as further enthusiasm for OER on their respective campuses<sup>36</sup>. This small sample size localizes the national trends and indicates a promising wide-scale impact for fellow Colorado institutions. The CDHE has noticed a trend in such improvements to student learning and/or no negative impact to learning as reported in the final reports from grantees in 2020<sup>37</sup>.

<sup>33</sup> "The Impact of Open Educational Resource on Various Success Metrics": <http://www.isetl.org/ijtlhe/pdf/IJTLHE3386.pdf>.

<sup>34</sup> "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\\_e4RwlQNchNByi7wbcMAY7Pc0sOIGF-oGjl1mZ6ESdUvOUJiqYj22TE1JccfmQDtOsHp4hmgFRolpHETD9LeltuM3KNAZkDtGVAqFQhKDE4zH7K4ww4TJh9PPUIBmuMA%3D%3D](https://link.springer.com/epdf/10.1007/s11423-019-09700-4?author_access_token=ddomufEBgUef598h7OMr_e4RwlQNchNByi7wbcMAY7Pc0sOIGF-oGjl1mZ6ESdUvOUJiqYj22TE1JccfmQDtOsHp4hmgFRolpHETD9LeltuM3KNAZkDtGVAqFQhKDE4zH7K4ww4TJh9PPUIBmuMA%3D%3D)

<sup>35</sup> PCC and PPCC data reported by each respective institution as required in the July 2019 OER Grantee progress report requirement. Note, these are the only institutions reporting full implementation of select courses in the summer 2019 term, hence the small sample size.

<sup>36</sup> See grantee profiles in appendix which include final reporting figures from all year one Grantees.

<sup>37</sup> See survey results in appendix.

## Innovations in Educational Practices

Moreover, 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 experiencing<sup>38</sup>. Such approaches include the co-creation and localization of curriculum and open pedagogical approaches to classroom facilitation and instruction—all hallmarks of the open education movement. In the first year of the OER grant program, we have learned of several faculty members pursuing these kinds of student-centered projects. Both faculty and students have voiced their intrigue and engagement around this approach to teaching and learning<sup>39</sup>.

## Alignment with State Goals

OER are a notable, 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 CCHE's master plan, *Colorado Rises: Advancing Education and Talent Development*, the scaled implementation of OER aligns with several strategic goals, especially Goal Four: Affordability and Innovation<sup>40</sup>. 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 opportunities<sup>41</sup>. 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.



**FIGURE 4:** Master Plan Goals from the CCHE & CDHE

<sup>38</sup> "Expanding the Scope: Illustrating the Impact of OER": <https://sparcopen.org/news/2019/expanding-the-scope-illustrating-the-impact-of-oer/>

<sup>39</sup> 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.

<sup>40</sup> "Colorado Rises": <http://masterplan.highered.colorado.gov/goal-4-invest-in-affordability-and-innovation/>

<sup>41</sup> "The State of Education": <https://drive.google.com/file/d/16tofb4KjSaCYqfPKI6w3PnDKsY83FDyL/view>

In 2020, OER was included in Governor Polis' *Roadmap to Containing College Costs and Making College Affordable*<sup>42</sup> 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 these Roadmap a reality for learners across the state. As explained by Governor Polis during the launch of the Roadmap:

***"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 students"***<sup>43</sup>.

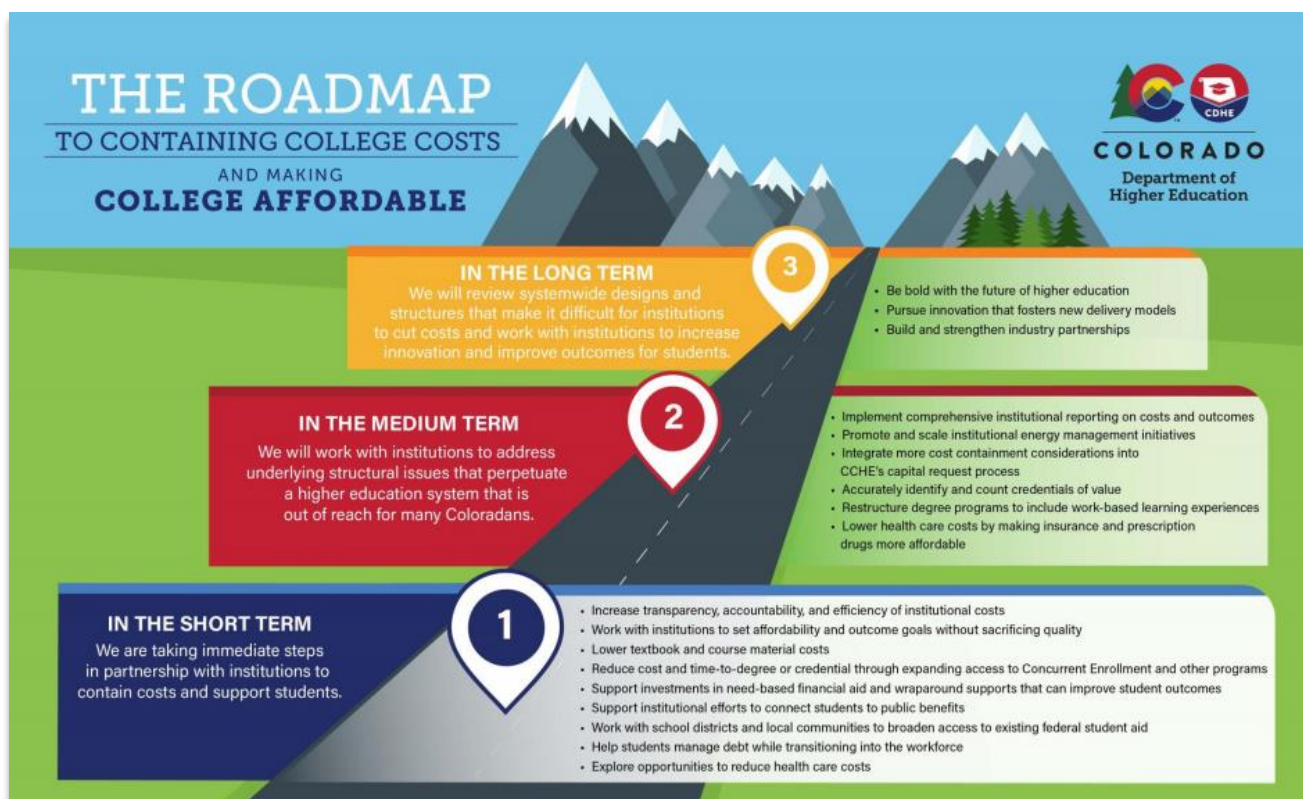


FIGURE 5: Image of the Affordability Roadmap

<sup>42</sup> See Roadmap at: <https://highered.colorado.gov/Publications/Reports/Roadmap-to-Containing-College-Costs-and-Making-College-Affordable.pdf>

<sup>43</sup> Quote via: <https://source.colostate.edu/gov-polis-announces-roadmap-to-build-on-college-affordability-efforts-for-colorado/>

## Effects of the Pandemic

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### COVID-19 Impact on Higher Education and OER Grantees

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The Global Pandemic caused a number of additional needs for learners and educators across the state: chief among them access to personal devices, such as computers, and 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 working<sup>44</sup>, while the pandemic and recession are factors driving greater interest in the high quality, low cost materials<sup>45</sup>. 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, the CDHE staff and OER Council recommended the Commission to act to approve a proposed reallocation of the 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 usage and the OER Council leadership's formal letter can be found in the appendix<sup>46</sup>.

Like everyone in the world, those in higher education and state government have been challenged in recent months while responding to and administering appropriate actions to address the emerging health pandemic caused by COVID-19. Colorado is no exception as institutions of higher education have transitioned to remote or online instruction. This transition allows 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 are at risk of being left behind if they do not have access to sufficient technology and equipment for adequately engaging 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:

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<sup>44</sup> See Bay View Analytics and WCET join report: <http://onlinelearningsurvey.com/oer.html>.

<sup>45</sup> Window of Opportunity for OER: <https://www.insidehighered.com/news/2020/08/13/pandemic-drives-increased-interest-open-educational-resources>

<sup>46</sup> Original agenda item can be found in the CCH meeting archive at: <https://highered.colorado.gov/about-cche/general-information/2020-meeting-schedule>.

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 feels 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 has postponed the annual OER Conference to October 2020. Therefore, the OER Council would like to reallocate this budget of \$40,000 to the *No Lapse in Learning* initiative.

As noted in the letter from the OER Council chairs<sup>47</sup>:

***“...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.

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<sup>47</sup> See appendix

By approving the redirecting of these funds, the Commission will help meet the following needs in alignment with the *Master Plan Goals of Colorado Rises*:

- **Erasing Equity Gaps:** furthering access for students in need of technologies will not only help 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 will help support student success in online and remote learning, ensuring their access to the high-quality experiences provided by their institutions.
- **Containing costs and pursuing innovation:** expanding access to technologies and furthering 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.

The reallocation of the conference funds to support the *No Lapse in Learning* initiative will indeed extend 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.

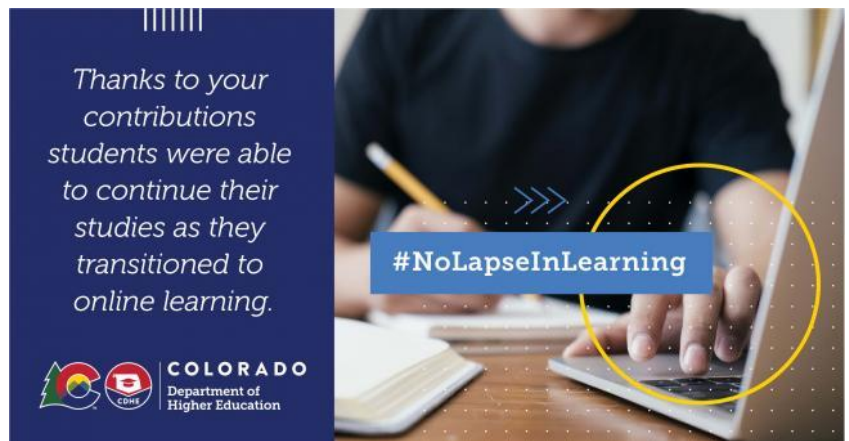


FIGURE 6: Image from the #NoLapseInLearning campaign

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 adding additional, unexpected responsibilities for many of the OER advocates who are also experts in digital learning. Thus, the 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, the impacts of the pandemic proved cumbersome for some of the actual grant program processes. Though the CDHE did indeed grant 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 online and any learning environment.

## Student Perspectives

The perspectives of students in the 2017 report<sup>48</sup> led to resounding support for a statewide OER initiative. With the majority of survey respondents identifying as students, more than 89 percent 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 through traditional survey, as well as ad hoc focus groups in student centers and libraries (see related images below).

Student enthusiasm for making college for accessible and affordable remain a driving factor in 2020. During the 2019-20 grant cycle, students continued to demonstrate this interest through engaging with the CDHE and presenting to the Colorado Commission on Higher Education several times regarding the importance of affordable, high-quality materials and the value of the OER program<sup>49</sup>. The Department has worked closely with both the Statewide Student Advisory Council (SSAC) of the Community College System and the independently organized Colorado Student Government Coalition (CSGC) to hold listening sessions and arrange for presentations to both Department staff and the CCHE.

*“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”*

*“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.”*

<sup>48</sup> See 2017 report at: [https://highered.colorado.gov/Publications/Reports/legislative/OER/OER\\_Nov2017.pdf](https://highered.colorado.gov/Publications/Reports/legislative/OER/OER_Nov2017.pdf)

<sup>49</sup> See CCHE notes from March 2020 meeting: [https://highered.colorado.gov/sites/highered/files/2020-04/march20\\_book.pdf](https://highered.colorado.gov/sites/highered/files/2020-04/march20_book.pdf).

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*<sup>50</sup>. 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 had 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:

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

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

*“They seemed excited to not have to spend money on a text<sup>51</sup>.”*

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

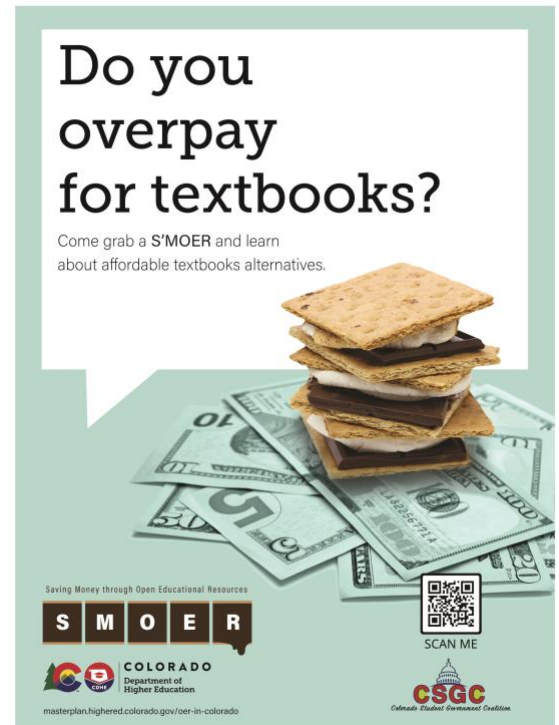


FIGURE 7: Image from the student campaign with CSGC

*“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.”*

<sup>50</sup> See the dedicated webpage at: <http://masterplan.highered.colorado.gov/smoers/>.

<sup>51</sup> Source: July 2019 CDHE OER Grantee progress report.



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

Several grantees from the CDHE OER Grant Program have also engaged students in various feedback activities in the libraries. For example, students from a public four-year institution, when asked what they would spend their money on if they did not have to use it for costly textbooks, reported such competing priorities as food, healthcare, and childcare. Colorado State University-Pueblo, for example, recently participated in the #RealCollege Survey<sup>52</sup>, a survey administered by Temple University, and found the following Basic Needs Insecurity Rates:

**39** PERCENT

of respondents were food insecure in the prior 30 days

**46** PERCENT

of respondents were housing insecure in the previous year

**17** PERCENT

of respondents were homeless in the previous year

Overall, 65 percent of students at CSU-Pueblo, one of Colorado's Hispanic Serving Institutions, experienced at least one of these forms of basic needs insecurity in the past year<sup>53</sup>.

<sup>52</sup> College and University Basic Needs Insecurity: A National #RealCollege Survey Report: [https://hope4college.com/wp-content/uploads/2019/04/HOPE\\_realcollege\\_National\\_report\\_digital.pdf](https://hope4college.com/wp-content/uploads/2019/04/HOPE_realcollege_National_report_digital.pdf) and <https://hope4college.com/realcollege-2020-five-years-of-evidence-on-basic-needs-insecurity/>

<sup>53</sup> Source: July 2019 CDHE OER Grantee progress report.



## Faculty Perspectives

Nationally, recently published survey data<sup>54</sup> 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 quarter of grantees said colleagues at their institutions are “aware”, or “very aware”, of open textbooks and how they are used<sup>55</sup>.

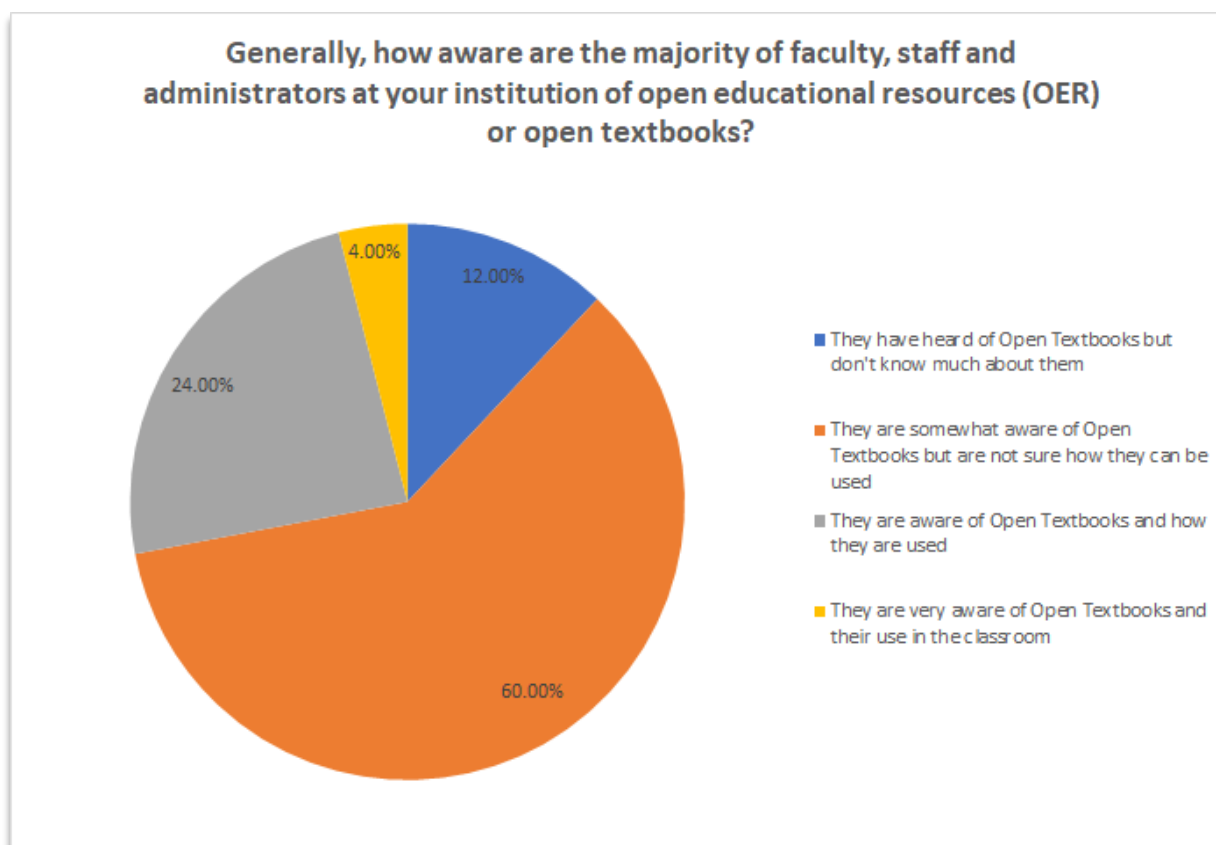


FIGURE 9: Survey responses demonstrating the growth in OER awareness in Colorado.

<sup>54</sup>The Impact of OER Initiatives on Faculty Selection of Classroom Materials: <http://onlinelearningsurvey.com/reports/impactofOERinitiatives.pdf>

<sup>55</sup> See survey summary in appendix.

This represents a significant increase when compared to similar survey data from 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.

The 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.

*“A high-quality resource which is free goes a long way to decreasing the divide among our most vulnerable students,” she said. “I did invest a bit of energy finding and navigating these resources, but the payoff in student engagement and success has fueled my desire to find more.”*

*“One lesson we learned was that we wish that we had the opportunity to attend the OER conference before we wrote the grant to know what we needed to ask for, and how to best implement our goals. It was such an insightful learning experience that reshaped our work.”*

*“Institutionally we greatly underestimated the amount of time to engage in open pedagogy and author original OER content. As an institution, we need to create a standard course release standard for different types of OER adoption (adoption, adaptation, creation).”*

*“The focus on OER exclusively needs to be expanded to all forms of Zero Cost models. For example, many of the ART 110 curated resources are not OER, but are free to use. As an institution, we need to have a broader view with a greater focus on all forms of cost containment as it relates to student textbooks and materials.”*

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

*“Implementation of OER in my General Studies math class sent a clear message to students that we are in this together. Students are keenly aware of the savings and appreciate our efforts toward adopting OER. In this way, and through faculty collaboration, OER positively impacts students financially and strengthens our academic community.”*

*“Empirical scholarly research suggests two important findings about OER: First, the implementation of OER can specifically improve learning outcomes for **underserved populations**; and second, students using OER from all populations performed at least on par with students in courses using conventional materials but with **lower course-withdrawal rates**. Not surprisingly, OER implementation is quickly becoming characterized as an act of social justice and equity in higher education, an idea that is certainly reflected in the **official NAACP statement promoting OER adoption**.”<sup>56</sup>*

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<sup>56</sup> Quotes taken from artifacts submitted by OER Grantees in final reporting; specifically, from FRCC, CCD, MSU-Denver and Aims. See the following for an example: <https://www.msudenver.edu/early-bird/2020/5/5-oer.shtml>.

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 student 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 adoption of OER in essential for successful statewide OER implementation efforts. The Department can 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.

## 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 the state of Colorado. The 2017 report on OER in Colorado 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 report<sup>57</sup>:

#### 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.

<sup>57</sup> Report to the Joint Budget Committee and The Education Committees of the General Assembly Open Educational Resources in Colorado November 2017: [https://highered.colorado.gov/Publications/Reports/legislative/OER/OER\\_Nov2017.pdf](https://highered.colorado.gov/Publications/Reports/legislative/OER/OER_Nov2017.pdf)

### Establish enabling structure and staffing at the state level with:

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

The report, containing the above recommendations, was presented to the Joint Budget Committee (JBC), Education Committee and Colorado Commission on Higher Education for approval prior to considering legislative action. The overwhelming consensus from these governing authorities, as well as the institutions of higher education, was in favor of pursuing the recommended 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<sup>58</sup>." 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.

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<sup>58</sup> Higher Education Open Educational Resources: <https://leg.colorado.gov/bills/hb18-1331>

## OER Grant Program

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### Summary

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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 campus would offer a larger return on investment. In, 2019, the second round of grant funding including \$1 million to Colorado institutions of higher education to continue to build the OER and Open Education initiatives seeded in year one of the legislation. Over 30 projects were selected to accelerate and continue to enhance the innovative landscape of higher education through Open Education work<sup>59</sup>.

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 Master Plan

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<sup>59</sup> See appendix for list of year two OER Grantees.

## 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 first grant cycle. To expand reach and compound the grant fund impact in year one, 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 2018, followed by several information sessions for interested applicants, a comprehensive review period and a refined list of recommendations for CCHE consent at the first 2019 meeting. Important dates throughout the process for grant cycle year one 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 this first-year grant cycle, there are two levels of grants, primarily organized by targeted applicant pools and associated requested dollar amount.

This process was duplicated for the second grant cycle in the fall of 2019 (with updates to the content of the request for proposals) and will also be updated and re-administered in the fall of 2020 for the third and final round of grant funding<sup>60</sup>.

### 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 <b>\$10,000-\$100,000</b>
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 <b>\$250-\$9,999</b>



<sup>60</sup> In 2020, significant updates to the timeline will be made due to changes forced by the pandemic response.



## Open Licenses and Accessibility

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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 addressing these topics for educators pursuing OER<sup>61</sup>. Furthermore, the CDHE and several campuses have continued dialogues with national organizations, specifically the Open Textbook Network (OTN), to propose a working group on accessibility in OER<sup>62</sup>. Undoubtedly, these priorities remain intact for the second year of grant funding, exemplifying the importance of these topics in pursuing the OER initiative.

## Year One Grantees

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In year one of the OER Grant Program, twenty (20) project proposals were granted funds to pursue various OER initiatives at their respective campuses. This includes fifteen (15) institutional-level initiatives as well as five (5) small group projects. In addition to these grantees, the OER Council and CDHE determined to fund three (3) institutions by means of providing funds to pursue professional development and statewide training opportunities related to OER specifically. This adjustment was a result of the decision to expand the initial 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 the first years' worth of 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 continuation of the OER Grant program for the next several years is not only a good idea, is necessary to meet the potential visions and intent of the educators and institutions in the state of Colorado.

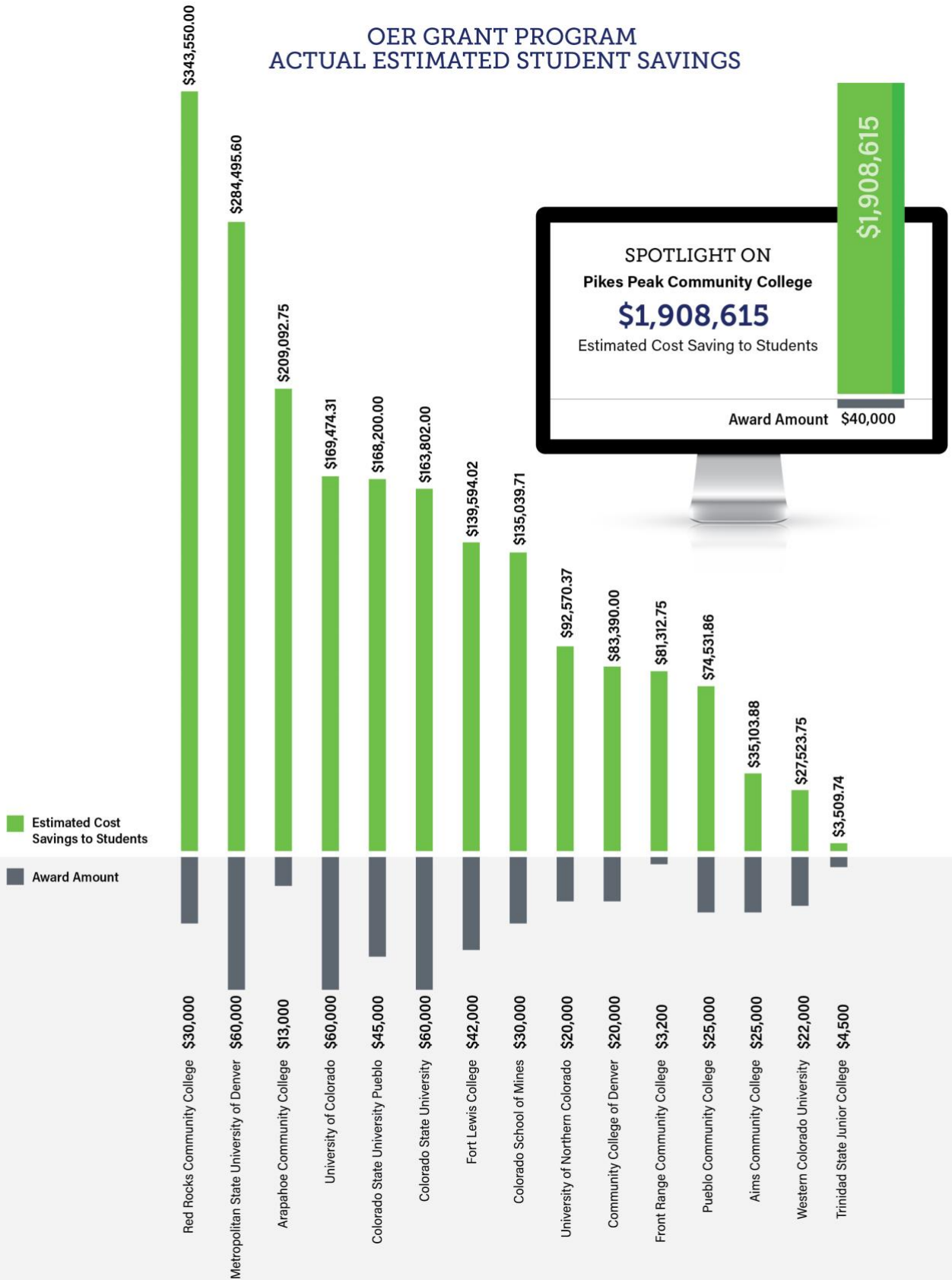
As mentioned previously, preliminary implementation of projects funded by the OER Grant Program have significant projected impact in aggregate cost-savings for students. Institutional grantees are projecting savings of more than \$3.9 million to the students of Colorado at their respective institutions. This number represents more than six times the return on the State's initial investment (ROI) into this initiative.

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<sup>61</sup> Refer to conference and training agendas in appendix.

<sup>62</sup> 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.

## OER GRANT PROGRAM ACTUAL ESTIMATED STUDENT SAVINGS



## Year One Grantee Profiles

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This first year of grant funding for OER in Colorado yielded creative projects ranging from several academic disciplines and approaches to open education. For example, the Red Rocks Community College project enables RRCC students to opt into an OER pathway to complete an AS or AA degree with 75 percent of the courses using OER material at zero-cost. While an engineering faculty member at Colorado State University led the collaborative development of an OER textbook for Engineering Mechanics Statics, a high-enrollment engineering gateway course. These two projects represent only a fraction of the varied approaches to OER work from the grantees, and a comprehensive overview of projects is included in the appendix of this report<sup>63</sup>. Diversity in approach to OER implementation and subject matter expertise has strengthened the initiative, with the CDHE providing intentional means for connecting faculty and staff to the current work being done by peers. The vision is for the CDHE to continue to serve as a hub for coordinating and communicating efforts of the 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 One Grant Progress

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As noted in the timeline, grantees were required to report on their progress toward goals in July 2019. The institutional grantees were swift in their implementation of their outlined OER projects, with many replacing costly materials for students in the fall 2019 and spring 2020 terms<sup>64</sup>. This attentive and agile response to the OER grant program exceeded the Department's expectations in terms of making an impact to student cost-savings from a short-term perspective. The OER Council and CDHE also are planning efforts for sustainable supports 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 had articulated a similar ambition in terms of return on the State's investment. In Colorado, we are now projecting to save students at least \$3.9 million dollars upon preliminary implementation<sup>65</sup>. 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 the 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 18<sup>66</sup>.

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<sup>63</sup> See Appendix A for a summary of OER grants projects from 2018-2019

<sup>64</sup> Only two grantees reported implementation for the summer 2019 term, allowing for further detailed reporting on their course level data pertaining to pass rates of students using OER.

<sup>65</sup> Projections are reported by grantees and aggregated by Department staff. Various levels of implementation depending on campus approach.

<sup>66</sup> Primary metrics to inform this list include the reports submitted by the OER Grantees during the July 2019 Progress Report. More comprehensive measures will be submitted at the end of the grant cycle, in May of 2020 and included in future OER reports from the CDHE.

## Year Two Grantees

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At the October 2019 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 second 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 2020.

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 2019, there were nearly 40 submissions for the grant, totaling over \$1.6 million in proposed projects. This represents about a 36% growth in application submissions over 2018, which signifies the elevated awareness and growth of this initiative throughout Colorado. This is important to Department staff and the OER Council because of the identified goal of 100% awareness of OER in Colorado.

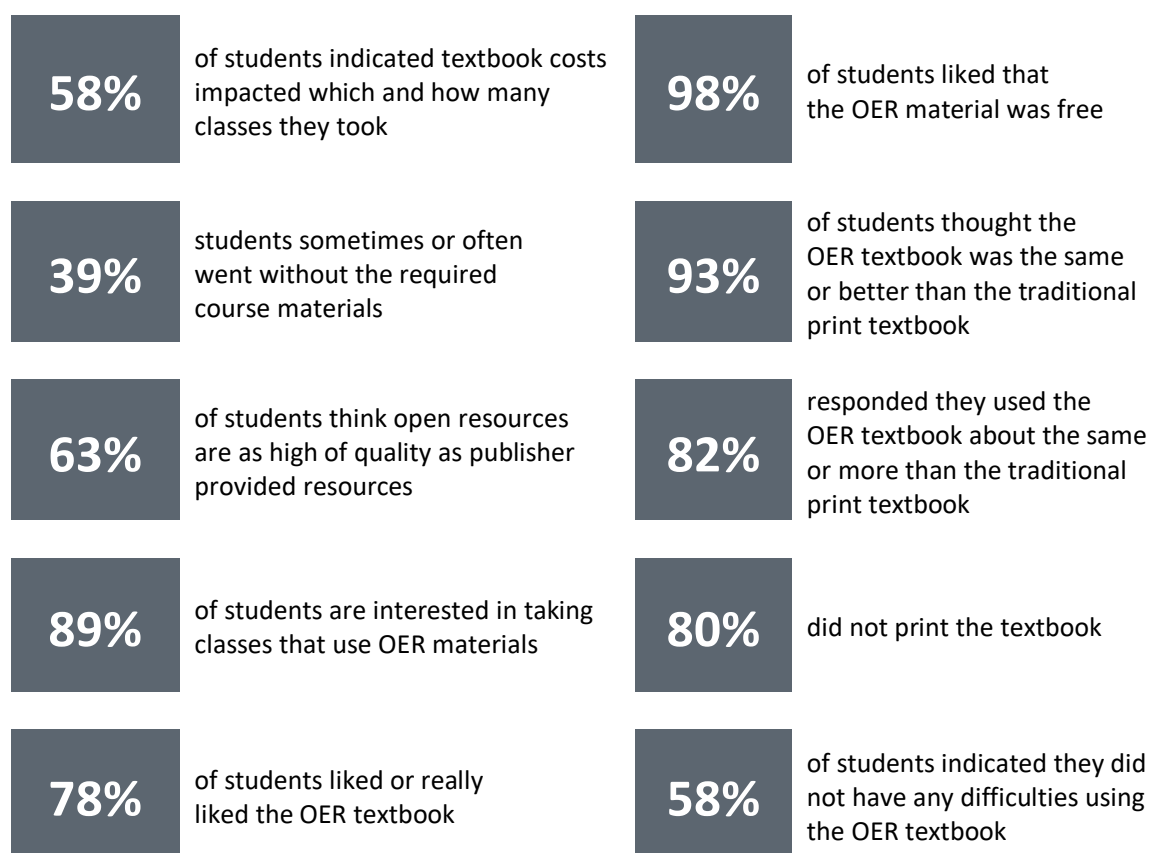
Within the proposals for the second grant cycle, 24 were from institutions of higher education for institutional level grants, and 14 for small groups or individuals; this also included proposals from 26 different institutions, including 15 community colleges, both urban and rural. The OER Council and 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 the Department staff. The Department staff made pre-notifications of shortlisted proposals available to applicants in December 2019. This afforded institutions an opportunity for future planning with the understanding that final approval of their grant status would take place at the February 2020 CCHE meeting.

As noted above, 34 grantees received grants as part of the second cohort, with projects ranging from small group/faculty proposals, to second year, multi-institutional approaches to comprehensive programs. With grantees from several institutions who had not participated previously, the State has reached 96% of eligible institutions who have received OER grant funds. Preliminary projections of student cost-savings from this cohort are showing at least a two-times return on the State's dollars, not counting the continued cost-savings from preliminary implementation. More importantly, the projects in the second 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 in 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 have also taken to collecting their own data and feedback via institutional surveys of students and faculty. For example, in student feedback survey from a Denver community college<sup>67</sup> the following perceptions from students were collected.



This survey, 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 2020 grantee survey documents this trend in further detail.

<sup>67</sup> Self-reported survey from Arapahoe Community College.

## Survey Results & Analysis

In 2017, institutions were surveyed on their Open Education and OER perceptions and current efforts as part of the CDHE’s preliminary report on Open Education in Colorado. The survey was completed by institutional OER champions and administrators as part of a foundational data collection effort. In 2020, institutions were again surveyed via OER Grantees to both assess progress and inform future decisions with regard to Open Education and OER in Colorado. Comprehensive results can be found in the appendix of this report, but themes gleaned during a review of the 2020 survey reveal the following trends.

### Metrics with current data and projections

Specific Metric	Measures from 2019 Report	Updated Measures from 2020 Report
<b>Estimated amount of student savings that resulted from using the open educational resources</b>	Preliminary aggregated cost-savings to students are projected at <b>\$3.4 million statewide as a result of grant-funded OER</b> and an additional \$1.6 for non-grant funded OER usage <sup>68</sup> . This represents nearly a seven times return on the State’s investment into the institutions of higher education.	Actual cost-savings to students from year 1 grantees are estimated to be \$3,925,487.74, while year 2 grantees project a preliminary estimate of an additional \$1,619,106.77 as a result of grant funded OER, as well as the an additional estimated \$1.6 million for non-grant funded OER.
<b>Measures of the effectiveness of the grant project</b>	Preliminary effectiveness measures of the grant project include number of public institutions participating in the grant program (19/31 eligible public institutions), number of Open Education Ambassadors trained to further OER efforts in their communities (65 representing 25 different institutions) and number of courses addressed (100) as well as students reached (23,500) by this initiative.	Preliminary effectiveness measures of the grant project include number of public institutions participating in the grant program (26/27 <sup>69</sup> eligible public institutions), 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 students reached (41,273) by this initiative.
<b>Number of students affected by open educational resources</b>	Preliminary aggregated student enrollment for OER courses utilizing grant funding total <b>23,958<sup>70</sup> statewide</b> . Additionally, non-grant funded OER courses reported by institutions on a voluntary basis include an additional 7,742 enrollments for a total of 31,700 enrollments overall.	Preliminary aggregated student enrollment for OER courses utilizing grant funding total 41,273 statewide. Additionally, non-grant funded OER courses reported by institutions on a voluntary basis include an additional 8,109 enrollments for a total of 49,382 enrollments overall.

<sup>68</sup> Primary methodology for calculating cost-savings to students is reported as the cost of course materials replaced multiplied by the number of students enrolled.

<sup>69</sup> Note: the number of actually eligible institutions is more accurately reflected in the 2020 report as a few are excluded from receiving funding from this grant.

<sup>70</sup> Total, aggregate number of enrollments.

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**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;**

The extent to which all public institutions are adopting OER can be a difficult measure because instructors are not required to report (and in some instances do not fully realize when) when they are using OER. However, it can be said that awareness of OER has grown among institutional leadership as all chief academic officers have been briefed on the initiative and all have been encouraged to form institutional committees or taskforces. Thus, when using institutional committees as a proxy for intentional exploration and adoption of OER, there are gains in the measures of statewide commitment to OER as there has been at least a **9% increase** in the number of institutional committees or taskforces<sup>71</sup>.

There is 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.

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**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;**

Preliminary aggregated number of courses offering OER as a result of the grant program represent a fractional percentage of courses offered by the public institutions in Colorado, though, a more complete percentage should be available upon completion of the grant cycle when all OER projects are required to submit complete reports (May 2020).

15 grantees (63% of the 24 responding) reported 1-33% of campus courses using OER. A lot of "I don't know" or variations of; 3 said between 21-33%, 2 between 11-20%, and 10 between 1-10%.

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**The open educational resources created and shared by grant recipients;**

Upon completion of the grant cycle, OER grantees shall report the location of OER developed through the grant program to the CDHE.

The CDHE has begun the process of creating a central referatory which will document the course materials adopted, used, or created by grantees<sup>72</sup>. This resource will grow into a more sophisticated platform in the next year of the program.

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<sup>71</sup> Percentage increase based on newly reported institutional committees from baseline assessment in 2017 report.

<sup>72</sup> Referatory currently available at: <https://docs.google.com/spreadsheets/d/1YbvFA-xQm9Q23dHFYeRdkeDYo5SRkuySgpCC4IXbQNM/edit#gid=1251208961> .

**The number of open educational resources revised (adapted) and adopted by grant recipients**

Upon completion of the grant cycle, OER grantees shall report the total number of OER revised and adopted through the grant program; a current count approximates **100 OER** revised and/or adopted by grantees, with a more complete accounting to come at the end of the grant cycle.

Approximately 164 open resources have been revised and/or adopted by grantees, though this number is evolving with the growing awareness of OER and with each adoption. Ultimately, the Department hopes to document as many instances of OER use through formal reporting and informal information sharing among institutions.

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

Upon receiving the Grantee Progress Reports to inform much of this report, only two campuses were able to report on this metric. **Both campuses reported marginal increases or no negative changes in student success metrics<sup>73</sup>.**

Similar trend, many did see bigger changes in Spring 2020 (either larger increases or decreases in pass rates) but said due to the pandemic and campus closures they did not paint an accurate comparison to previous, non-OER courses.

## 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.

**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.**

The CDHE and OER Council have now gleaned the feedback from the first and second cohort 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 the 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. One unifying challenge for all involved has and will continue to be those posed by the Pandemic of 2020. The CDHE is working to maintain a responsive, stakeholder informed approach to support OER Grantees during this time and continuing to do so during the forthcoming recovery.

<sup>73</sup> PCC reported a .3% increase in pass rates for their summer OER course while PPCC reported 1% increased in DFW rates for two courses.



## Statewide Training and Development Activities

Over the course of the last two years, the CHDE and 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 supports for large scale change in approaches to educational resources and implementation of OER. Despite the challenges posed by the Pandemic, the 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 the 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, the CDHE administered over 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 trainings, workshops, and conferences have been archived for future reference via Google Docs, YouTube, and other sharing platforms.

Beyond the 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 the CDHE hosted at Front Range Community College in October 2019 for the Open Education Ambassadors. Local trainings 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 a 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 second 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 and again in March of 2020. 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. See appendix for a comprehensive list of activities. All activities were recorded and archived on the [Department YouTube channel](#) for future utilization and access. Live attendance for the week totaled over 200 participants, with that number growing through the archived presentations. This number represents approximately 80% growth from 2019, indicating a growing appetite for Open Education in Colorado.



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, Governor Polis issue 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. Over 120 Ambassadors engaged in this sessions, which aims 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 the 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<sup>74</sup> from public, private, two-year, four-year and technical schools attended the training. Another cohort of Ambassadors are scheduled to be trained in 2020.



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

<sup>74</sup> See appendix for roster of current Open Education Ambassadors in Colorado.

## Statewide OER Conference & 2020 Virtual Summit

Following that training, the Department hosted the first Colorado OER Conference at Lowry Campus (see Attachment E). More than 220 attended the event to hear speakers and experts from Colorado and across the country. The Department was also fortunate to have the executive director, governor and local congressman participate in the event as they led the morning charge preceding the opening plenary. This comprehensive professional development opportunity leveraged the OER budget to provide hundreds of Colorado educators with a comprehensive look at best practices, growing trends, and trainings for OER implementation in higher education. See a complete agenda in the appendix.

As a result of attending the conference, 87 percent of attendees reported they developed a deeper understanding of OER, including practical techniques and strategic approaches to implementation and/or adoption, while more than 91percent improved my awareness and understanding of OER and open education as a movement for achieving student success in education<sup>75</sup>. This event was a successful means by which OER capacity building took place in Colorado this year, and it can also be said the symbolic leadership demonstrated by elected officials at this event conveyed the important role and potential of OER in Colorado's education system. The hope is that the combined financial and symbolic support for this work continues in order to make the biggest impact possible.



**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.

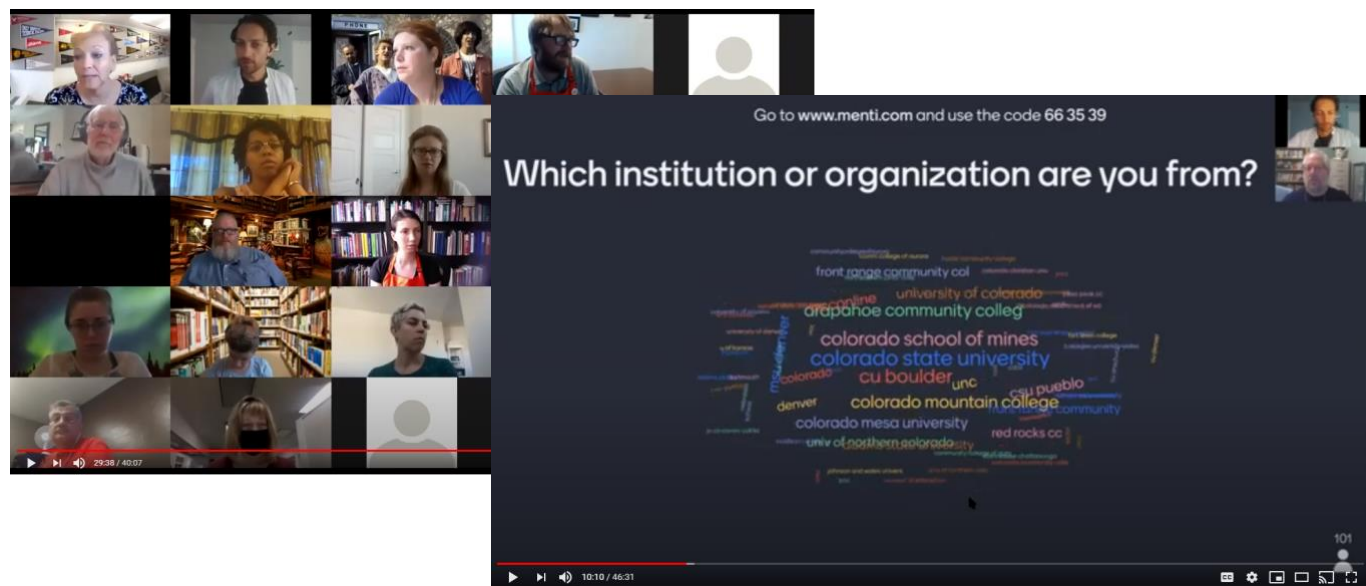
Due to the Pandemic in 2020, the CDHE and OER Council quickly decided to abandon plans for a in-person convening for Open Education in Colorado and shift adroitly toward an online model for engaging with educators to deepen statewide awareness and expertise for Open Education and OER. The result of this responsive change was the OER Virtual Summit, which held in June of 2020. The OER Virtual Summit garnered over 1,250 registrants, representing exponential growth and capacity from the previous year's

<sup>75</sup> Source: 2019 OER Conference Feedback Survey.

event due to the online format and an appetite from educators to learn more about OER during the pivot to online learning. The event not only attracted Colorado educators, but colleagues from nearby states such as Kansas and Wyoming, which were able to attend at no additional cost to either host or attendee. Speakers include national policy experts, the CDHE's Executive Director Angie Paccione, and faculty from Colorado who highlighted their inclusive approaches to open pedagogy. Department staff and several other presenters also took the opportunity to recognize the societal conversations surrounding the Black Lives Matter movement both locally and nationally, acknowledge the role education must play in addressing systemic issues and equity. Overall, the convening was a success, with attendees reporting satisfaction with the content and variety of presentations.



FIGURE 13: Collection of images from the 2020 OER Virtual Summit



## Staff & Council Recommendations

In 2020, 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 the 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)<sup>76</sup>. At the least, 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 innovation education.

CDHE and the OER Council must continue to foster a statewide community to meet their goals of 100 percent 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.

<sup>76</sup> See appendix for award profile or visit: <https://wcet.wiche.edu/initiatives/wcet-awards/wow/media-release-2019>.

## 2019-2020 Colorado OER Council Members



Alana Lipscomb,  
Student Representative



Brittany Dudek, Chair,  
CCCOline



Jaimie Henthorn,  
CU System



Dustin Fife,  
Western Colorado University



Emily Bongiovanni, Vice Chair,  
Colorado School of Mines



Emily Ragan,  
MSU Denver



Jonathan Poritz, Chair Emeritus,  
CSU-Pueblo



Mark Manzanares,  
Adams State University



Meg Brown-Sica,  
Colorado State University



Regan Harper,  
Colorado Department  
of Education



Susan Kendall,  
Arapahoe Community College



Tina Parscal,  
CCCOline



Renee Martinez,  
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Spencer Ellis,  
Colorado Department of  
Higher Education



Jen Mayer,  
University of  
Northern Colorado



Lobna Alsrarj,  
Colorado Department of  
Higher Education

**FIGURE 14:** 2019-20 Colorado OER Council Membership appointed by the CDHE Executive Director and CHDE staff

## Acknowledgments

Thank you to the following government leaders, staff members and collaborators for their ongoing support with this project!

Governor Jared Polis	Jay Hale, Financial Assistant
Executive Director Angie Paccione	Beth Hunter, Graphic Designer
Senator Bob Rankin	Megan McDermott, Director of Communications
Representatives Julie McCluskie and Chris Hansen	Chloe Mugg, Legislative Liaison
Original bill co-sponsors Rankin, Young and Lundberg	Kim Poast, Chief Student Success & Academic Affairs Officer
Casey McCoy-Simmons, PhD Student, University of Denver	Chris Rasmussen, Director of Academic Affairs
Shelley Banker, Director of COSI	Tennelle Swan, Communications & Social Media Strategist
Christina Carrillo, Academic Policy Officer	Michael Vente, Sr. Director of Research
Carl Einhaus, Director of Student Affairs	Katie Zaback, Sr. Policy Director

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## Image Credits

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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:** Screenshot of Governor Polis' ZTC Challenge webpage

*Source*- Colorado Department of Higher Education

**FIGURE 3:** Fundamentals of Business Law textbook by M. Randall & CCD Students

*Source* – Community College of Denver

**FIGURE 4:** Master Plan Goals from the CCHE & CDHE

*Source* - Colorado Department of Higher Education

**FIGURE 5:** Image of the Affordability Roadmap

*Source* – Colorado Department of Higher Education

**FIGURE 6:** Image from the #NoLapseInLearning campaign

*Source* – Colorado Community College System

**FIGURE 7:** Image from the student campaign with CSGC

*Source*- Colorado Student Government Coalition; screenshot from CDHE website

**FIGURE 8:** 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 9:** Survey responses demonstrating the growth in OER awareness in Colorado

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

**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

**FIGURE 13:** Collection of images from the 2020 OER Virtual Summit

*Source*- Colorado Department of Higher Education

**FIGURE 14:** 2019-20 Colorado OER Council Membership appointed by the CDHE Executive Director and CHDE staff

*Source*- Colorado Department of Higher Education website; images from individual members of the Council

## Appendices

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**See separate document**

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