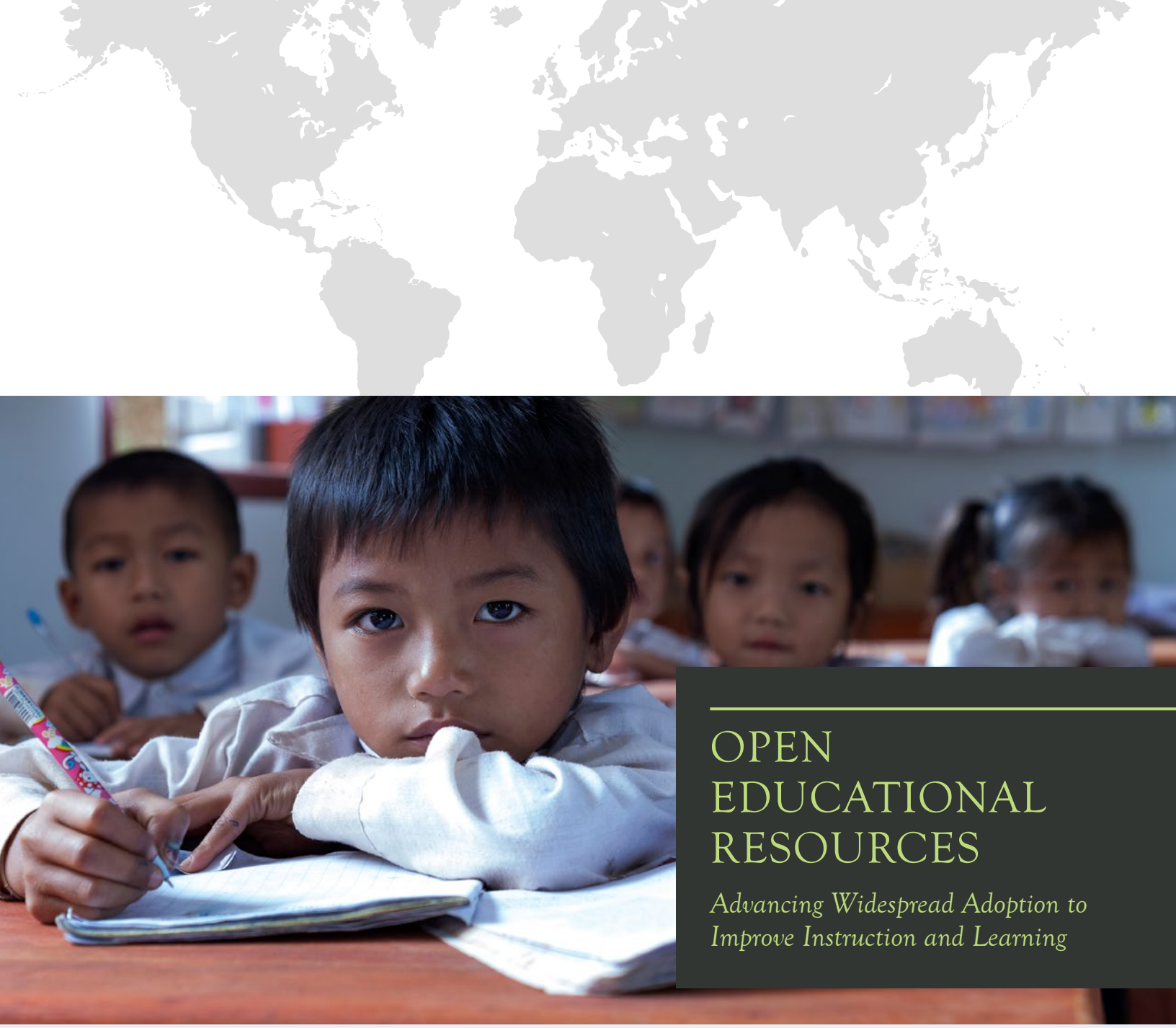

OPEN EDUCATIONAL RESOURCES

Advancing Widespread Adoption to Improve Instruction and Learning

THE WILLIAM AND FLORA HEWLETT FOUNDATION

DECEMBER 2015

OPEN EDUCATIONAL RESOURCES

DECEMBER 2015

The William and Flora Hewlett Foundation helps people build measurably better lives, concentrating its resources on activities in education, the environment, global development and population, performing arts, and philanthropy, as well as grants to support disadvantaged communities in the San Francisco Bay Area.

The Hewlett Foundation's Education Program makes grants to improve education by expanding the reach of openly available educational resources, improving California education policies, and by supporting "deeper learning"—a combination of the fundamental knowledge and practical basic skills all students will need to succeed.

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EXECUTIVE SUMMARY

Since 2002, the Hewlett Foundation has worked with Open Educational Resources (OER) grantees to improve education globally by making high-quality academic materials openly available on the Internet. The Education Program continues to work toward establishing a self-sustaining and adaptive global OER ecosystem and demonstrating its potential to improve teaching and learning.

OER's past successes have built a promising foundation for mainstream adoption.

In 2002, The Hewlett Foundation began investing in Open Educational Resources (OER)—high quality teaching, learning, and research resources that are free for others to use and re-purpose. OER presented an extraordinary opportunity for increasing access to education, sharing knowledge, fostering instructional innovation, and supporting personalized learning. The widespread use of OER would empower educators to tailor instruction and enable students to make meaningful choices about their own education while dramatically lowering the cost of instructional materials.

PHOTO : John Hogg, World Bank
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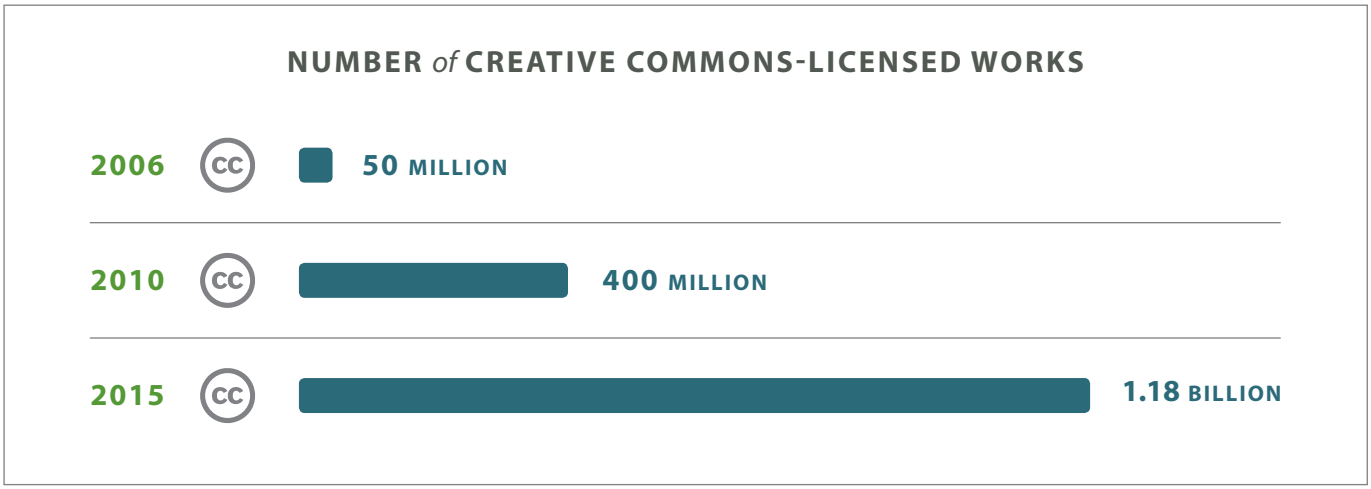
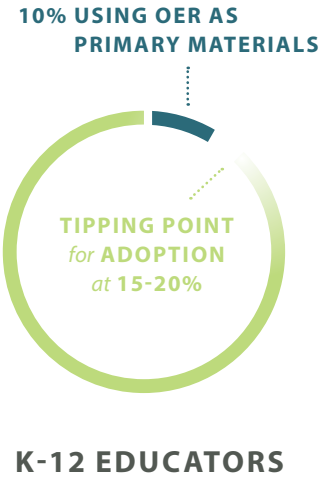
When the Foundation first began to support OER, the concept was relatively unknown so our approach focused on building the field. The Foundation invested in many of the key anchor institutions that needed to be in place for the field to grow and funded a variety of opportunistic projects that capitalized on new innovations. Many of these early Hewlett Foundation grantees are now prominent not only within OER but also within the education field more broadly. For instance, OpenStax at Rice University is producing textbooks that have been adopted by over 1,000 courses worldwide, and MIT OpenCourseWare now averages a million visits each month.[1]



These early investments helped create a field that has grown well beyond our initial expectations. Creative Commons' licenses have increased at an astonishing rate, from 50 million pieces of content in 2006 to over 1 billion in 2015.[2] Moreover, the permissions on these licenses are growing more open over time; in 2010, 40 percent of open licenses did not restrict commercial use or adaptations, while that number has increased to 56 percent in 2014.[3] The U.S. Department of Labor has leveraged billions of dollars to create open materials for community colleges, and the government of South Africa has distributed open textbooks from Siyavula Education to every school in the country.[4] Overall, 14 governments have also made national commitments to open education, which is pushing OER to scale.[5]

This remarkable growth led the Foundation to step back and explore whether OER could reach mainstream adoption so that it is the default choice for teachers and students rather than the exception. To investigate, the Foundation commissioned a Boston Consulting Group (BCG) study in 2013, which found that OER's growth constitutes the "green shoots" that are often precursors to mainstream adoption of an innovation. BCG found that roughly 10 percent of K–12 educators were using OER as a primary material, which demonstrated even broader adoption than expected.[6] Based on patterns from other industries, we realized that OER could be nearing a tipping point where adoption begins to accelerate as more mainstream teachers and students see evidence that early adopters are pleased with the innovation. Empirical research of other innovations places this tipping point around 15 to 20 percent of market share.[7]



The Foundation can accelerate mainstream adoption by using a problem-based approach to strategy.

Based on the BCG results, the Foundation realized that we had an unprecedented opportunity to scale OER and unleash its potential to improve teaching and learning in the future. Therefore, we refreshed our OER strategy to focus on our goal of using grants to help OER reach mainstream adoption. Instead of continuing our previous strategy—which primarily funded key players and promising opportunities that had the momentum to reach scale—we wanted to show teachers and students what they could gain from adopting OER, so we decided to position these materials as the solution to some of the most pressing problems in education. This problem-based approach will identify the issues that are most relevant to teachers and students and make targeted grants that apply OER to solve them at scale. This new, more concrete emphasis can significantly grow the adoption of open materials and build a base of users who, regardless of why they initially adopt open resources, gain the freedom to take advantage of the benefits of openness.

This shift is well timed because important education stakeholders are identifying a number of problems with the dominant publishing model. In the United States, textbook costs are rising rapidly while quality suffers, particularly in the K–12 market in terms of alignment with the latest educational standards. In the developing world, there are often shortages of high-quality materials, and many students cannot access the existing materials due to cost barriers and copyright issues that prevent translation. Across all countries, teachers feel bound to rigid curricula that are not tailored to their students' needs and local contexts. OER may be able to solve these problems.

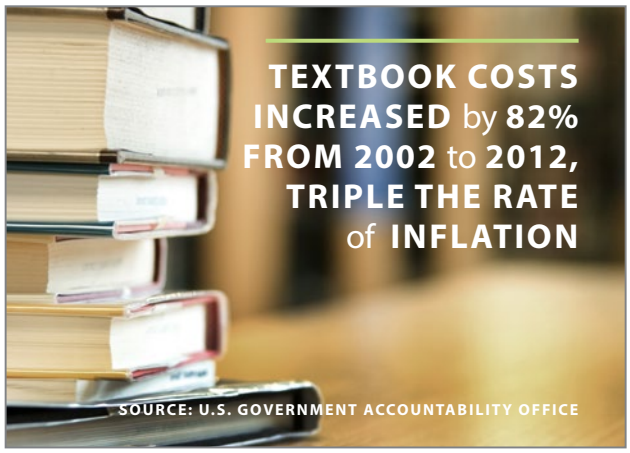


PHOTO : CCAC North Library
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The Foundation has reviewed these issues and identified potential pathways for problem-based investment through internal discussions, expert input, and field-wide strategy. The Foundation will consider pathways in the K–12 and postsecondary domains in the United States and internationally. The pathways described in this document are initial hypotheses toward which we are already making grants, but we will adapt and shift our investments as we continue to learn about opportunities and as we consult with the field and our Board. Over time, we envision a rolling set of grant priorities that allow us to pursue new pathways as older challenges are resolved.

Alongside pathway investments, the Foundation will reserve part of its portfolio to continue funding the infrastructure necessary to support the field. This continued support will ensure that the technical basis, leadership, anchor institutions, and research capacity that have driven OER's growth to date remain healthy in the long term.

OER can strengthen pedagogy and reduce costs for higher education.

In the United States, the symptoms of a broken educational market are acutely visible in the soaring costs of college textbooks. Textbook costs increased by 82 percent from 2002 to 2012, at triple the rate of inflation.[8] Moreover, existing materials can restrict the pedagogical freedom of faculty; textbook content is not flexible enough to match innovative teaching methods; and where commercial content does offer flexibility, opportunities to adapt are only available inside proprietary platforms. In developing countries, the market for educational resources can be even more ineffective. Students feel the burden of cost acutely, curricula are underdeveloped, and the market sees little opportunity for profit, limiting the incentive to produce effective educational resources appropriate for local contexts.[9]

THE HEWLETT FOUNDATION *will* **SUPPORT USE** *of* **OER** *to* **ADDRESS CRITICAL PROBLEMS** *in* **EDUCATION**

OPPORTUNITIES
(e.g. exploratory grants for future pathways)

PROGRAM DOMAINS AND PATHWAYS

POSTSECONDARY
Open textbooks for the most enrolled courses, zero textbook cost degrees in community colleges, and future opportunities

K-12
Common Core instructional materials, educational materials in the developing world, and future opportunities

INFRASTRUCTURE INVESTMENTS
Technical basis, leadership, anchor, institutions, research capacity

OER OUTCOME

OER are widely used as primary materials in mainstream education, enabling effective teaching and learning

GOAL *Underserved students have greater access to education and receive personalized instruction that improves learning*

OER offer a promising way to address issues related to both costs and pedagogy. Open materials can help increase access to higher education for students who cannot afford to attend college, and can also help alleviate cost burdens on students who are at risk of dropping out for financial reasons. Open materials can empower faculty with the academic freedom to tailor their courses to their students' needs and even engage students in meaningful learning experiences through adaptation and improvement of the open content itself.[10] In the near term, the Foundation will continue funding in two pathways that build on current grants:

Open textbooks for the most-enrolled college courses. Open textbooks in high-enrollment courses can deliver cost savings and pedagogical benefits to the maximum number of students. Moreover, the familiar form of textbooks will likely aid adoption because faculty are more comfortable with textbooks than with less traditional forms of open resources. Tactics that will support this effort include building the supply of easily discoverable, high-quality open textbooks; providing technical assistance for faculty; and promoting open materials to faculty and librarians.

Zero textbook cost (ZTC) degrees in community colleges. A ZTC degree replaces traditional textbooks with free, openly licensed materials for an entire degree program. For community college students in particular, the cost savings are significant: up to 30 percent of tuition, fees, and supplies.[11] Moreover, ZTC degrees ensure that the benefits of open materials follow students from enrollment to graduation, allowing for a pathway of personalized courses that guide students toward completing their degrees. The strategy for scaling ZTC degrees includes identifying and supporting strategic early adopters, supporting targeted advocacy, building technical assistance capacity, and strengthening the supply of open materials to cover entire degree pathways. The ZTC degree pathway is being funded as a separate Hewlett Foundation initiative, designed to succeed through a single, larger, time-bound investment. After the initiative ends, the Foundation may continue to fund aspects of the pathway if necessary to ensure its long-term success.

Given our limited resources at the present time, we do not envision a full-fledged, postsecondary pathway outside of North America. However, several of our existing grantees are working on related issues, particularly in the developing world, providing the types of leadership and technical capacity for OER that we envision supporting under our grantmaking for infrastructure. These anchor institutions and leaders will continue their work of encouraging governments and postsecondary education institutions to adopt policies that are supportive of OER. Furthermore, we will explore ways in which our grantmaking in these two pathways can inform work in other countries.

OER can boost both quality and access for K–12 education.

PHOTO : *Paul Wood, US Department of Education*
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The current instructional materials procurement model used in the K–12 education system in the United States is flawed. It has led to inefficient government spending on texts that do not meet academic standards (e.g., Common Core); constrains teachers' flexibility to adapt materials; and limits student uses of content, including the rights to mark up, highlight, and take textbooks home. In the developing world, scarcity of educational materials is a general problem; in many places, six or more students often share a single, outdated textbook, while teachers face a shortage of workbooks, exercises, and other materials.

Open materials are well suited to address these problems. In the United States, OER can fill key gaps in the market for instructional materials by providing effective resources that are aligned with academic standards. Cost savings from adopting open materials could also redress inequities by allowing underfunded districts to reallocate money to serve students in other ways and to keep materials current by leveraging local educator expertise. In the developing world, open instructional materials could meet students' needs where no materials currently exist, and empower educators to tailor resources to their local context through translation and adaptation. The Foundation will invest in grantmaking and explorations around two pathways in K–12:

Instructional materials aligned to common standards. Although numerous states have adopted common standards in math and English Language arts since 2012, implementation in many schools has been rocky and uneven, due in part to a lack of high-quality, effective instructional materials aligned to the standards and limits in district textbook budget cycles. The common standards pathway aims to provide aligned open materials to teachers in a format that is familiar and easy to use. To achieve this goal, the Foundation will support increasing the supply of aligned materials to cover full years in math and English language arts, and encourage reform in district procurement processes to promote adoption of open materials by state education agencies and districts. Other subject areas with common standards, like science, may follow.

Educational materials in the developing world. Open materials can provide vital resources for schools, teachers, and families to educate children in the developing world. This pathway would promote open resources as a solution to gaps in educational materials for grades K–12, which are often purchased by national governments. The Foundation is initially exploring what role OER might play in increasing the availability of early reading materials for children. Many children in the developing world do not have access to books to read and therefore never become literate. The Foundation's initial grants will examine whether and how OER can be part of the solution to this problem. The Foundation will likely focus on countries where it has prior experience, such as those that have received OER grants and those in which the Global Development and Population Program has funded education work.

The Foundation will continue supporting robust infrastructure for OER.

As the strategy shifts to emphasize pathways to scale, the Foundation will back its investments with robust and flexible infrastructure. This infrastructure, which is necessary to enable OER to grow and spread, is a valuable product of past efforts to build the field. Therefore, on top of the pathways it selects at any given time, the Foundation will also make ongoing investments in OER infrastructure.

To ensure mainstream adoption, the Foundation will support four essential elements of infrastructure. First, the technical basis for OER is a prerequisite for their existence and ability to continue growing and includes open licenses, interoperability, and accessibility standards. Second, leadership from core champions will be increasingly relevant as the field moves towards mainstream adoption because these individuals will continue the work of fueling supportive policies and the field's growth. Third, anchor institutions house the technical capacity for open materials and provide institutional support for the policy-related and technical work of individual champions. Finally, research capacity is essential to assess the impact of open materials on student learning and answer strategic questions about the best paths to scale.

David Ernst of the University of Minnesota leads a Open Textbook Network faculty workshop for the North Dakota University System, October 2015.
PHOTO : *Sara Cohen*
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Foundation staff will manage a pipeline of pathways and monitor progress.

The Foundation will continue using research and exploratory grants to build a pipeline of pathways for future investment. The Foundation is selecting and sequencing potential pathways based on a set of factors including benefits to users and the strategy, the potential to succeed, the unique role philanthropy can play, and resources for execution. In particular, the Foundation is prioritizing pathways that support equity for underserved students.

The field has already started coalescing around several of the potential pathways (e.g., ZTC degrees and instructional materials aligned to common standards), so the Foundation will support grantees by gradually shifting resources to the chosen pathways. Throughout this transition, the strategy will maintain strong support for infrastructure. A small portion of the budget will be reserved for investments in promising opportunities outside the current pathways, including exploratory grants for developing new pathways.

The use of monitoring and evaluation will track progress and guide future efforts as the Foundation maintains and updates the portfolio. The most important indicator for whether open materials are reaching the mainstream will be the percentage of higher education faculty and K–12 educators or districts adopting open resources as their primary course material. Additional metrics from the Foundation's OER dashboard and pathway-level metrics will provide further information about the factors contributing to this ultimate goal of adoption.

Collaboration with grantees and funders will help scale results.

A problem-based approach will help broaden the Foundation's collaborative relationships to include supporters of OER and the organizations that directly work on the specific problems. Since the problems targeted by the pathways are too large for any single organization to solve alone, the Foundation will provide enhanced support for grantee collaboration. A problem-based approach also opens up new possibilities for collaboration with funders who focus on the specific problems that open materials may solve (e.g., college completion or early childhood learning). Therefore, this strategy refresh presents valuable opportunities to build a broader coalition of supporters, coordinate across a larger pool of resources, and help new solutions reach scale.

INTRODUCTION

In 2013 Tidewater Community College launched an innovative program called the Z Degree, named for "zero textbook costs." Professors in the business administration program searched online for the free, openly licensed content that would best meet their students' need, remixed and adapted it, and then replaced their traditional textbooks with these materials. Within months, professors reported that new teaching techniques and course materials suited to their unique groups of students had led to better student engagement and learning. Professor Linda Williams reflected, "It…absolutely transform[ed] the way I teach, what I teach, and how my students learn." Student Megan Kadesch liked that "everything is online, and… there's more out there for you besides just the book." Melissa Hoch, a single mom providing for her family while studying, saved thousands in textbook costs and calls the Z Degree "one of the best things that's happened to me since I've been at [Tidewater]."[12]

Tidewater is part of a broader movement in education that is benefiting from open instructional materials. The Utah Open Textbook Project created openly licensed, printable science textbooks for the K–12 market, which Utah's Office of Education distributed statewide for only five dollars apiece.[13] The Teacher Education in Sub-Saharan Africa network (TESSA) gathered more than 700 teachers and teacher educators to create free and flexible materials in four languages and 10 country contexts for school-based teacher training, and by 2010, 400,000 teachers had used TESSA resources.[14]

The efforts of Tidewater Community College, the Utah Open Textbook Project, and TESSA demonstrate that OER offer tangible benefits and can provide pedagogical freedom, improved learning, and cost savings. The use of open materials holds great potential to improve both access to education and the quality of that education around the world and at all grade levels.

The Hewlett Foundation began investing in OER in 2002 and has played a central role in supporting the field. Since then, however, the field has grown and matured significantly. Through a strategy refresh, the Hewlett Foundation is now seeking opportunities to build on the field's successes and take OER to scale, thus maximizing its full potential to improve global education.

1.

CONTEXTUALIZING *the* OER STRATEGY

DEFINITION OF OPEN EDUCATIONAL RESOURCES (OER)

OER are "teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use and re-purposing by others."

In this strategy, we also use the following terms to mean OER: open materials, openly licensed materials, open instructional materials, open resources, and open content. Open textbooks are a specific type of OER.

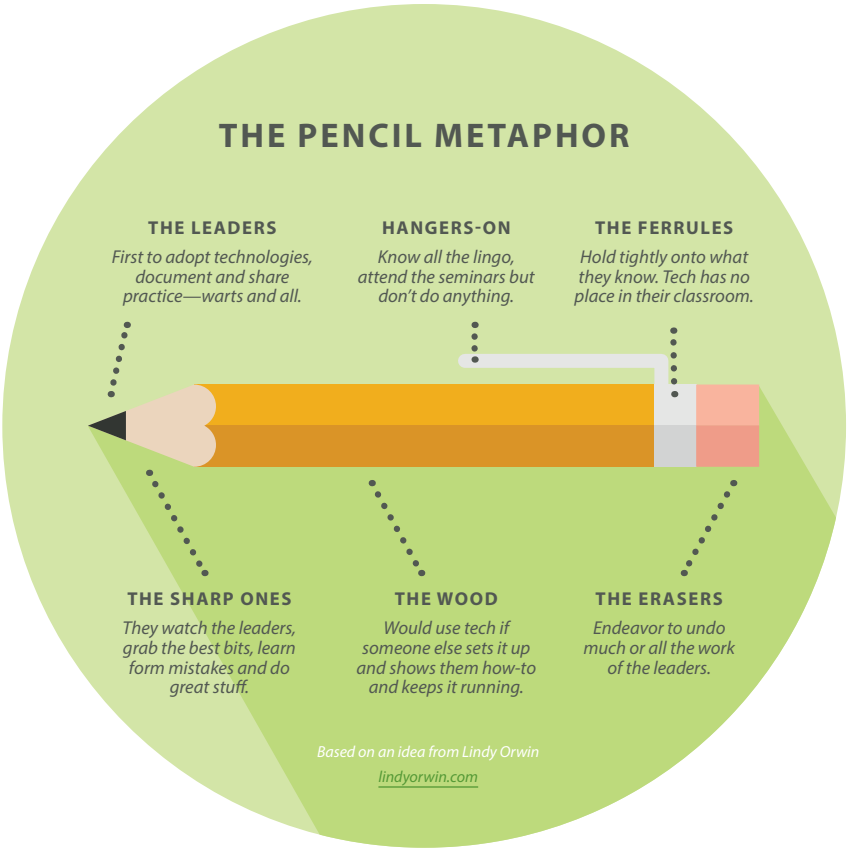
The field's past successes have built a promising foundation for mainstream adoption.

Through its work in OER, the Hewlett Foundation promotes a world in which students around the globe, particularly those from underserved populations, have better access to education and can more easily experience personal learning. OER can increase the agency of teachers and students by empowering teachers to tailor instruction and enabling students to make meaningful choices about their own education.

Back in 2002, the concept of OER was relatively unknown, but the Foundation saw the Internet's immense potential to dramatically increase the supply and availability of effective educational resources. Therefore, we pursued a field-building approach, supporting many of the key anchor institutions that were needed to grow the field and funding a variety of opportunistic projects that capitalized on the new innovations in the field. The Foundation sought out those who had widely respected resources they were willing to openly license. Many of these early Hewlett Foundation grantees are now prominent not only within OER but also within the broader education field. For example, OpenStax at Rice University produces open textbooks that have been adopted by over 1,000 courses worldwide and MIT OpenCourseWare now averages a million visits each month.[15]

The Foundation's early investments helped create a field that has grown well beyond our initial expectations. Creative Commons' licenses have increased at an astonishing rate, from 50 million pieces of content in 2006, to 400 million in 2010, to 882 million in 2014.[16] Moreover, the permissions on these licenses are growing more open over time; in 2010, 40 percent of open licenses did not restrict commercial use or adaptations, while that number increased to 56 percent in 2014.[17] The U.S. Department of Labor has leveraged billions of dollars to create open materials for community colleges, and the government of South Africa has distributed open textbooks from Siyavula Education to every school in the country.[18] Overall, 14 governments have made national commitments to open education, which is pushing OER to scale.[19]

This remarkable growth led to our decision to step back and explore whether OER could reach mainstream adoption and become the default choice for teachers and students rather than the exception. To investigate, the Foundation commissioned a Boston Consulting Group (BCG) study in 2013, which found that OER's growth constitutes the "green shoots" that are often precursors to mainstream adoption of an innovation. BCG found that roughly 10 percent of K–12 educators were using OER as a primary material, which demonstrated even broader adoption than expected.[20] The Foundation realized that, based on patterns from other industries, OER could be nearing a tipping point in which adoption begins to accelerate as more mainstream teachers and students see evidence that early adopters are pleased with the innovation. Empirical research of other innovations places this tipping point at around 15 to 20 percent of market share.[21]



In order to move OER adoption from the early leaders to the mainstream—the wood of the pencil in this metaphor—the Hewlett Foundation will support efforts to use OER to solve critical problems in education.

To accelerate mainstream adoption, the Foundation will shift to a problem-based approach to strategy.

This transitional period provides an unprecedented opportunity to set the stage for OER's potential to improve teaching and learning around the world. Through field-wide strategy meetings and interviews with grantees and OER leaders, the Foundation has heard a clear demand to move toward scaling adoption. Therefore, the Education Program has refreshed the OER strategy to ensure that the Foundation's grants do as much as possible to support this goal. We decided to switch from our previous strategy of funding key players and promising opportunities that had the momentum to reach scale, and instead more purposefully position OER as the solution to some of the most pressing problems in education. In doing so, we hope to demonstrate to teachers and students the benefits of adopting OER. This problem-based approach will identify the issues that are most relevant to teachers and students and make targeted grants that apply OER to solve these problems at scale. This new emphasis on concrete benefits can significantly grow the adoption of open materials and build a base of users who, regardless of why they initially adopt open resources, gain the freedom to take advantage of open educational practice.[22]

The box below shows how the strategy will pursue a series of investments in a pipeline of pathways across the K–12 and postsecondary domains, both in the United States and abroad, including a complementary set of grants to continue support for OER infrastructure. At first, the strategy will pursue no more than three or four well-defined pathways that have early momentum. During this time, program staff will continue to flesh out future possibilities based on capacity and interest in the field, and may even give exploratory grants to set the stage for a new pathway. Over time, the Foundation will begin to invest in pathways further down the pipeline as earlier efforts come to fruition.

THE HEWLETT FOUNDATION *will* **SUPPORT USE** *of* **OER** *to* **ADDRESS CRITICAL PROBLEMS** *in* **EDUCATION**

OPPORTUNITIES *(e.g. exploratory grants for future pathways)*

PROGRAM DOMAINS AND PATHWAYS

POSTSECONDARY
Open textbooks for the most enrolled courses, zero textbook cost degrees in community colleges, and future opportunities

K-12
Common Core instructional materials, educational materials in the developing world, and future opportunities

INFRASTRUCTURE INVESTMENTS
Technical basis, leadership, anchor, institutions, research capacity

OER OUTCOME

OER are widely used as primary materials in mainstream education, enabling effective teaching and learning

GOAL *Underserved students have greater access to education and receive personalized instruction that improves learning*

OER aim to tackle gaps in the current market for educational materials.

The Foundation's shift to a problem-based approach is well timed because important education stakeholders are identifying a number of problems with the dominant publishing model, and OER offers the promise of resolving them. Textbook costs in the United States are rising rapidly while quality suffers, particularly in the K–12 market in terms of alignment with the latest educational standards. The developing world suffers from shortages of high-quality materials, and many students cannot access the existing materials due to cost barriers and copyright issues that prevent translation. Teachers in all countries feel bound to rigid curricula that are not tailored to their students' needs and local contexts. The Foundation sees OER as an opportunity to advance beyond such problems. The educational market today gives teachers little choice over what or how to teach their students, and it provides only limited resources to help students reach their full potential. Instructional materials are among the most critical factors to student learning so addressing this broken market is crucial to reforming education systems worldwide.[23]

Because deficiencies in instructional materials affect K–12 and postsecondary education, the OER community works in both these domains as well as across the United States and internationally. This work often involves close collaboration in the field to build global infrastructure and to share lessons that transcend national boundaries. Similarly, the Foundation's strategy includes both K–12 and postsecondary institutions, but will focus on a subset of U.S. and international work within those domains and prioritize efforts that reach underserved students. The Foundation's investments in infrastructure will tackle cross-cutting issues related to OER itself, supporting the global open materials movement and enabling work at all grade levels. Because the Foundation cannot work in all areas directly, it will seek to share relevant lessons with the field to support the efforts of other funders and OER champions in those spaces.

Through internal discussions, expert input, field-wide strategy meetings, and careful consideration of the most pressing needs, the Foundation has developed an emerging set of pathways in the K–12 and postsecondary domains. The Foundation will initially pursue those pathways that build on previous areas of grantmaking but will also explore other pathways within each domain. The Foundation is selecting and sequencing potential pathways based on a set of factors including benefits to users and the strategy, the potential to succeed, philanthropy's unique role, and resources for execution. The "managing the strategy and monitoring progress" section addresses the factors impacting pathway selection in more detail.

The next two sections of this document describe the postsecondary and K–12 domains as well as the initial pathways the Foundation is pursuing within each. The subsequent section addresses the infrastructure domain and the final section elaborates on how the Foundation will execute the strategy.

2.

STRENGTHENING PEDAGOGY *and* REDUCING COSTS *for* HIGHER EDUCATION

In higher education, students face spiraling textbook costs, and faculty need materials that better support innovative pedagogy.

In the United States, the symptoms of a broken educational market are acutely visible in the soaring costs of college textbooks. Textbook costs increased by 82 percent from 2002 to 2012, at triple the rate of inflation.[24] These costs can restrict access to college for a significant population[25] and hinder learning by dissuading many students from purchasing required course materials.[26] Several factors contribute to the problem of increasing cost. Professors choose textbooks but since they don't pay for them, cost is not an important factor—in fact, a 2014 Babson Research Group survey found that faculty rank cost as the least important consideration in their textbook choices.[27] This demonstrates that publishers have little need to compete on price to ensure their books are adopted. Additionally, the top few publishers have concentrated market power. In higher education, five publishing companies control over 80 percent of the $8.8 billion publishing market, which insulates them from competition.[28]

The higher education system also tends to offer little support or reward to faculty who excel pedagogically or openly share the resources they create. As a result, professors often struggle to make instructional materials and pedagogical approaches fit the needs of unique groups of students and course objectives. Currently, faculty members often tailor their course objectives to meet the structure and content of the textbook instead of the other way around.

PHOTO : *MCPearson*
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In developing countries, the market for educational resources is even more ineffective. Students feel the burden of cost acutely, faculty members are often underqualified and poorly rewarded, institutions lack adequate libraries, and curricula are underdeveloped.[29] Moreover, the publishing market sees little opportunity for profit and faces weaker publishing infrastructure and distribution channels, limiting the incentive to produce effective educational resources appropriate for local contexts.[30] These problems mean many students cannot access higher education at all, and those who do continue their schooling may not receive a high-quality education.

OER can increase access to affordable and effective higher education.

"In the past, I only had the official adopted textbook to choose from. Now I have the whole world, using open courseware from people who are worldwide experts in the fields I teach. I'm finding incredibly creative and innovative approaches to concepts that I wouldn't have come up with myself. That kind of freedom is amazing."

Professor Linda Williams, TIDEWATER COMMUNITY COLLEGE [31]

OER offer a promising solution to issues related to both pedagogy and costs. Open materials can empower faculty with more academic freedom to tailor their courses to the needs of their students. Professors with limited time can adopt open textbooks and only modify select parts, allowing them to move away from the rigid prescriptions of traditional textbooks without building new resources from scratch. Professors can also curate their own instructional materials to replace textbooks, leading to more flexibility and creativity in course content and teaching approach. Students often find these digital resources and non-traditional pedagogical approaches more engaging.[32]

The cost benefits can allow more students to complete college. First, open materials can help increase access to higher education for students who cannot afford it. Studies indicate that cutting tuition and fees by $1,300 (roughly the annual cost of textbooks for an associate's degree) could grow college attendance in the United States by approximately 5 percent.[33] Second, open materials can help alleviate cost burdens on students who are at risk of dropping out for financial reasons. Paying for textbooks forces students to work extra hours and strains their studies, and 54 percent of students who do not complete their degrees cite needing to work more hours as the primary reason they leave college.[34] The Z Degree at Tidewater Community College has begun to illustrate the benefits of open materials. In the first year of the program, Tidewater cut the cost of graduating with a business degree by nearly 30 percent, and attrition dropped by 6 percent for courses that switched to open materials.[35]

Finally, in the developing world, open materials can give faculty and students the effective educational resources they currently lack. Because these resources are free, students and institutions can afford to acquire more materials, and because open materials can be adapted, faculty can select from a wider range of base materials and then translate them into local languages and contexts.

The Foundation is exploring pathways that help postsecondary faculty teach effectively.

Within the postsecondary domain, the Foundation is already working on two initial pathways: open textbooks for the most-enrolled college courses and zero textbook cost (ZTC) degrees in community colleges. In addition, the Foundation continues to explore other opportunities to solve pressing problems in postsecondary education in the United States and abroad.

PATHWAYS IN THE POSTSECONDARY DOMAIN

- **Open textbooks for the most enrolled college courses**
- **Zero textbook cost degrees in community colleges**
- **Future opportunities**

OPEN TEXTBOOKS FOR THE MOST-ENROLLED COLLEGE COURSES

Shifting to open textbooks is a relatively easy shift for postsecondary faculty because they are a relatively familiar unit of instructional materials for courses that traditionally depend on textbooks. Many professors in the United States are already considering using open materials in the near future; a 2014 survey of higher education teaching faculty conducted by Babson Survey Research Group found that over three quarters expect to use OER or would consider using them in the next three years.[36] Open textbooks can seize on faculty receptivity in order to scale adoption. Tactics for this pathway include:

Building the library of easily discoverable open textbooks. The supply of searchable open textbooks is already growing. The University of Minnesota's Open Textbook Library includes nearly 200 textbooks created and peer reviewed by faculty from nine institutions, while OpenStax College's 16 textbooks for the most popular introductory-level college courses have been adopted by more than 1,000 courses around the world in fewer than three years and downloaded nearly a million times, and have saved students more than $50 million.[37] These open textbooks have been a major focus of the Foundation's past OER work, and continuing to expand supply will bring these benefits to more students.

Providing technical assistance. Organizations that have deep, hands-on experience working with professors seeking to adopt and adapt open textbooks can provide invaluable expertise to overcome barriers to OER adoption. Technical assistance providers can curate open textbooks to help faculty choose the appropriate open resources to replace and supplement their current course materials; train faculty on how to build open materials into a full course and take advantage of open licensing; and support outreach to stakeholders like administrators and librarians.

Promoting open textbooks among faculty and librarians. To grow adoption, OER advocates must educate faculty about why open materials are better than traditional textbooks. Costs are often the most easily understandable incentive for switching, but faculty can also learn about open licensing's benefits, including the possibility of open educational practice. Additional research into the effect of OER on college completion, via increased access and better student learning, can help build faculty support for open textbooks. In addition, open resource advocates can provide faculty with opportunities and incentives to spend hands-on time with the materials, such as by offering them the opportunity to review open textbooks.

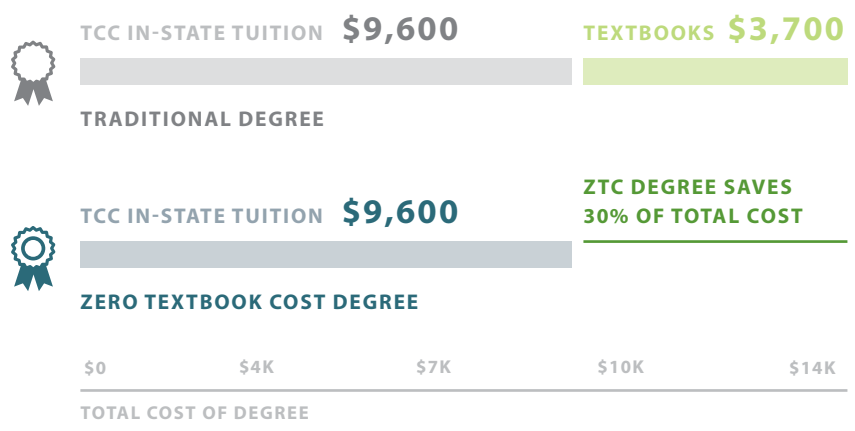
This pathway will focus on both four-year and two-year institutions to help establish the credibility of open textbooks as effective for student learning; many students who will be in a position to spread openness as future teachers and researchers attend four-year colleges. At the same time, this pathway will promote equity by prioritizing institutions with diverse student bodies. It will also engage faculty and advocates to produce effective textbooks that can be used in two-year colleges—a spillover benefit that will be especially helpful for colleges with limited capacity to create their own open textbooks to support large, underserved student populations.

ZERO TEXTBOOK COST DEGREES IN COMMUNITY COLLEGES

The zero textbook cost (ZTC) degree eliminates textbook costs for an entire course of study by replacing traditional textbooks with free, openly licensed materials. This pathway is a separate Foundation initiative, with a large, time-bound investment that goes beyond the standard OER budget.

Virginia's Tidewater Community College introduced the first zero textbook cost degree (the Z Degree) in its business administration associate's program. More than 1,700 students have participated in Z Degree courses and attrition has dropped by 6 percent for courses that switched to open materials.[37] Following suit, Northern Virginia Community College recently implemented two ZTC degrees in general education and social sciences, and more than 5,000 students have enrolled in these pilot courses so far. [38]

The long-term benefits of ZTC degrees extend far beyond cost savings. ZTC degrees with open materials also have the potential to reshape community college curricula, empowering faculty with the flexibility to remix custom materials for their students now and in the future.



This pathway will build on the early success of ZTC degrees to bring the model to students and teachers at community colleges across the United States. The effort includes:

Identifying and supporting the next set of early adopters. The Foundation will help build momentum for ZTC degrees by fast-tracking programs in a set of favorable, high-impact locations. It will select these pilot programs based on criteria such as administrator and faculty co-champions; innovative, clearly defined implementation proposals; and diversity of the student body. To support the work of these early adopters, the Foundation will reach out to philanthropic partners to expand funding opportunities.

Scaling the model through targeted advocacy. Several potential approaches could help scale ZTC degrees in different contexts. First, advocates could work through networks to empower peer-to-peer persuasion. This approach would mirror other community college programs that have used networks to reach scale, like the Achieving the Dream Network, which now includes 200 colleges across 34 states.[39] Second, advocates could leverage competition among colleges that serve students in the same region. Third, advocates might educate policymakers about how policies can incentivize the creation of ZTC degrees.

Ensuring implementation with sufficient tools and expertise. The Foundation will build technical assistance capacity to ensure that colleges interested in creating ZTC degrees have the information and support necessary to succeed. Organizations ranging from OER experts to colleges with existing ZTC degrees could all play important roles in technical assistance.

Strengthening the supply of postsecondary OER to fuel expansion. Continued creation of effective postsecondary open materials will become crucial to long-term scaling of ZTC degrees. The Foundation will ensure that there are sufficient OER options for each ZTC degree course in early majors, gather and support the distribution of remixed ZTC degree materials for re-sharing, and fund the creation of sets of open materials for new majors.

The ZTC pathway will focus primarily on two-year institutions because they serve diverse students who are particularly at risk of dropping out for cost-related reasons but need college degrees to achieve greater social mobility. Two-year institutions also require fewer courses to graduate than four-year colleges, which simplifies the course materials needed to obtain a degree. As the Foundation pursues this pathway, it will conduct research to ensure that ZTC degrees are achieving the goal of increasing college completion. Research will also test different approaches to scaling the model, thus providing valuable lessons for OER advocates and funders interested in spreading ZTC degrees to other parts of the world.

Given our limited resources, we do not envision a full-fledged postsecondary pathway outside of North America. Several of our existing grantees, however, are working on issues related to postsecondary education, particularly in the developing world, and will continue to encourage governments and educational institutions to adopt policies that are supportive of OER. They provide the types of leadership and technical capacity for OER that we envision supporting under our grantmaking for infrastructure. Furthermore, we will explore ways in which our grantmaking in these two pathways can inform work in other countries.

3. BOOSTING QUALITY *and* ACCESS *for* K–12 EDUCATION

K–12 education suffers from a scarcity of effective instructional materials and inefficient procurement models.

In the K–12 education system in the United States, the current educational market and instructional materials procurement models fail to provide students with effective materials that are aligned to the latest educational standards. In many cases, standards-aligned content is not even being created. For instance, 17 out of 20 K–8 math series reviewed by EdReports failed to align to the Common Core State Standards, despite being labeled as such.[40]

Even where aligned materials exist, they often do not reach the most disadvantaged students. In many districts, procurement restrictions limit access to effective materials[41], for example, having state-approved textbook lists dominated by traditional publishers, and there is only enough funding to replace each textbook every six to ten years.[42] As a result, less than one third of educators report having "access to high-quality [standards]-aligned textbooks."[43] Students with specialized needs, such as English language learners, suffer disproportionately from these funding limitations.[44] A Council of Great City Schools survey found that four-fifths of teachers believe current instructional materials for English language learners do not reflect the rigor of recently adopted standards.[45]

TOP 3 PUBLISHERS CONTROL 90% OF THE MARKET

Moreover, K–12 textbooks are increasingly expensive, which wastes taxpayer money that could be allocated to other priorities in underfunded districts. The Association of American Publishers reports that U.S. spending on K–12 textbooks in 2011 was $8 billion[46]—a significant expenditure given how dissatisfied educators are with what has been purchased. Similar to the postsecondary market, rising costs are driven by concentrated market power. The top three publishers control 95 percent of the K–12 reading market and 86 percent of the K–12 math market, though other players provide supplementary materials outside of core textbooks. Other publishers struggle to compete with lower-priced or more effective materials because these top publishers have well-established distribution channels, years of experience, and relationships to back their expansive marketing.

The problem in the developing world is perhaps even more pressing. In some places, six or more students may have to share one outdated textbook, and teachers face a shortage of workbooks, exercises, and other materials to support lessons.[47] Children also lack access to books outside of the formal education system. Fewer than half the children around the world have three or more books at home.[48]

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PHOTO : *Todd Huffman*
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Such problems are most severe where the market is not strong enough to attract a diversity of publishing companies to create educational materials. Private sector publishers are often wary of entering markets in developing countries because consumers struggle to afford books, distribution is challenging, and printing is expensive.[49] Some countries like South Africa are shifting towards state control of textbook production, which also can deter private publishers from entering the market. A nationalized textbook market makes it harder for local publishing to grow, resulting in a narrow supply of materials.

Even in countries that report as many textbooks as pupils, there may be local disparities. Within a country, some schools in wealthier areas have more than one textbook per student, while the most disadvantaged students face shortages.[50] Additionally, there are shortages of materials targeted to diverse language and contextual needs. Publishers want to cater to as broad an audience as possible, and so materials are often produced in English or other languages that are common in the country. UNESCO estimates that 221 million children are taught in a language that is not their mother tongue, causing them to struggle to acquire basic skills as they are expected to simultaneously master a foreign language.[51]

OER can fill gaps in the market with flexible, affordable materials.

OER are well suited to address problems with the current market and procurement inefficiencies. In the United States, open materials can empower teachers with flexibility that benefits student learning. If teachers are no longer bound to the structure of traditional textbooks, they will have more freedom to incorporate creative lessons and adapt the sequencing and style of their lessons to their students' needs. Districts can also gather their expert teachers to update, maintain, re-align, and otherwise continue development of open content for other teachers in the district.

In addition, cost savings from adopting open materials can aid progress on many other problems districts currently face. For example, districts can adopt new versions of open materials as soon as they are published, rather than waiting anywhere from 6 to 10 years for sufficient funding to procure new textbooks. The widespread use of open materials in the United States would also enable the reallocation of billions of dollars in funding to other educational uses that further deeper learning, creating opportunities for other policy advancements. Finally, given that open materials are free, they could compete favorably in state and district procurement processes, which would encourage publishers to compete on quality and price.

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Because the educational market is still in its fledgling days in the developing world, open resources can help leapfrog the problems faced by the traditional publishing structure, as seen in the United States, and make better progress on providing equitable, affordable, and effective materials. Open licensing allows educators to translate books into their local languages and provide free or low-cost educational materials. Open resources can be distributed in print, through mobile devices, or online, so schools and parents without sophisticated technology can still use them. In countries with state control of textbooks, open government policies could result in widespread distribution and availability of materials. South Africa's Department of Basic Education, for instance, printed 10 million openly licensed books from Siyavula Education at a cost of only two dollars per book.[52]

Moreover, open resources can play a catalytic role by introducing nascent markets to effective instructional materials, creating a cycle that builds demand and spurs publishers to produce more content. Publishers in developing countries often avoid the early childhood market because the public does not know the full benefits of exposing children to early reading so demand for these books is low. As counterpoint, however, when nonprofit organizations in Nepal began to provide books for young children, this work popularized early literacy by demonstrating its educational benefits and proving that students, teachers, and parents would use these materials. Subsequently, publishers began producing additional materials to serve this market.[53]

As the Foundation further develops pathways in the K–12 domain, we will collect feedback from experts and grantees to learn about additional opportunities in the developing world. We will seek to better understand the dynamics of the publishing industry in the developing world and the potential pathways that could relate to problems, such as youth unemployment and health.

The Foundation is seeking pathways that improve access to effective educational resources.

The Hewlett Foundation is currently exploring two pathways in the K–12 domain that build on previous grants: instructional materials aligned to common standards in the United States and educational materials in the developing world. The Foundation will also continue to investigate other national and international K–12 opportunities.

PATHWAYS IN THE K-12 DOMAIN

- Instructional materials aligned to common standards
- Educational materials in the developing world
- Future opportunities

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INSTRUCTIONAL MATERIALS ALIGNED TO COMMON STANDARDS

Beginning in 2010, in response to stagnating educational achievement and inequity for U.S. students, nearly all states adopted the Common Core State Standards in math and English language arts. Yet, implementation of these common standards in many schools has been rocky and uneven. One major challenge is that many schools and teachers lack new, effective materials aligned to the standards.[54] The EdReports review of math curricula cited previously demonstrated that even for materials claiming alignment to the Common Core, 17 out of 20 publishers' K–8 math series were not aligned.[55]

A pathway focused on instructional materials aligned to common standards aims to put high-quality, open materials into the hands of teachers in a format that is familiar and easy to use, thus maximizing potential for adoption. The Foundation's Deeper Learning strategy has actively supported the supply of Common Core instructional materials, and this OER pathway plans to link to and build on this work. To do so, program staff will coordinate with the Deeper Learning team to pursue promising joint opportunities and share relevant lessons. Potential tactics include:

Increasing the supply of aligned materials to cover full years in math and English language arts. In a 2013 Boston Consulting Group survey, about half of K–12 educators reported awareness of OER.[56] However, most teachers surveyed were also skeptical of the quality of open materials and confused about how to find and use them. To address this issue, the K–12 OER Collaborative is a new, state-led effort to develop comprehensive, effective, easily discoverable materials aligned to the Common Core.[57] The work of such organizations will help fill major gaps in the supply of Common Core–aligned instructional materials. The Foundation will also explore making investments in existing Common Core–aligned OER, like EngageNY's materials, by supporting further adaptation, development, curation, and effective use.

Filling gaps in aligned materials for special needs students. As the K–12 OER Collaborative and other organizations develop Common Core–aligned open materials, the Foundation will devote special attention to ensuring there are versions suitable for English language learners. Open instructional materials can benefit all students but are likely to disproportionately benefit struggling schools that cannot afford effective materials or lack the capacity to find them. These schools tend to have high populations of underserved students, such as English language learners, and there is likely to be substantial funder interest in this aspect from an equity perspective.[58]

Supporting targeted advocacy to promote adoption of OER by state education agencies and districts. The Foundation will support early adopters to build momentum for K–12 open materials. Schools with large numbers of English language learners offer a promising place to begin scaling adoption. Teachers of English language learners are often strapped for time and resources to adequately serve the needs of many diverse students. As mentioned above, the survey conducted by the Council of Great City Schools found that four-fifths of teachers believe current instructional materials for English language learners do not reflect the Common Core's rigor. As a result, half of the respondents reported using materials they developed on their own.[59] These teachers, burdened with creating materials from scratch, could be eager to seize the potential of open resources to facilitate collaborative development.

The Hewlett Foundation will continue reviewing potential opportunities for open resources to further Common Core implementation. As there is early uptake of common, standards-aligned, open materials, the Foundation will support research into their impact on student learning and pedagogical approaches. Such research will facilitate our understanding of how to successfully scale OER and communicate its benefits.

EDUCATIONAL MATERIALS IN THE DEVELOPING WORLD

This pathway will focus on educational materials for K–12, which national governments in developing countries often purchase, and seek opportunities to incorporate OER as a way to increase educational access. This pathway would provide vital resources for schools, teachers, and families to educate school-aged children in the developing world.

Since the OER field is less mature in the developing world and the work is geographically dispersed, this pathway focuses on shifting institutional and government policies. The Foundation's work to date with international grantees has focused largely on policy levers as one of the most viable paths to build momentum and grow the international OER field. At the same time, the Foundation anticipates making exploratory grants to test whether investments in specific types of OER might provide opportunities to have more concerted impacts. Most notably, the Foundation is currently investigating the role of OER in increasing the availability of early reading materials.

Currently, the Foundation has identified the following potential tactics for this pathway:

Promoting open licensing of educational materials produced by major donor institutions. Many institutions that support education in the developing world, such as USAID, DFID, UNICEF, and the Global Partnership for Education, produce and/or fund the production of effective materials to enhance access in areas with few resources. However, while the institutions have good intentions for sharing, their materials are seldom put online and even more seldom openly licensed, which prevents translation for reuse in other countries. For example, USAID and the Malawi Ministry of Education's Tikwere Interactive Radio Instruction program created a successful series of stories, activities, and exercises for teachers and students but they were not disseminated as open resources.[60] Advocacy aimed at persuading major international funders to openly license the materials they are already creating could yield a wealth of new materials designed to reach the most disadvantaged students.

Encouraging major donor institutions to adopt and distribute existing open materials. When major donor institutions distribute educational materials, they often use a combination of new materials produced in-house and existing materials adapted from other contexts. In addition to pushing for open licensing of any new materials, the Foundation would encourage institutions to choose open resources when adopting existing materials for distribution. Widespread adoption by major donors could help bring existing open materials to particularly disadvantaged locations, like refugee camps, where they could be a strong fit to address cost, mobility, and translation needs.[61]

Advocating for governments with existing OER-friendly policies to support greater production and adoption. Advocates could encourage governments with existing OER policies to develop and implement plans to better support OER. Additionally, OER champions could reach out to countries that support the popular open access movement but have not yet developed open resources policies, such as Burkina Faso, Paraguay, and Chile, and encourage them to move to full open licensing.[62]

Grants in this pathway will likely focus on countries where the Foundation has prior experience, such as those that have received OER grants and those in which the Global Development and Population Program has funded education work.

4.

SUPPORTING ROBUST TECHNICAL *and* INSTITUTIONAL INFRASTRUCTURE

INFRASTRUCTURE PRIORITIES

- **TECHNICAL BASIS**
- **LEADERSHIP**
- **ANCHOR INSTITUTIONS**
- **RESEARCH CAPACITY**

As the OER strategy shifts to emphasize pathways to scale, the Foundation will back its investments with robust and flexible infrastructure. Many components of this infrastructure are valuable outcomes of the field building that has occurred over the past decade, including developing strong anchor institutions and clear open licensing standards. Going forward, the Foundation will focus on building four specific elements of infrastructure:

TECHNICAL BASIS: The heart of OER is open licensing. Sustaining open licenses is a prerequisite for the field's existence and ability to continue growing. In terms of actual technical features, OER must have the right metadata and be included in search engines so materials are discoverable for users; must be built for interoperability so materials can be used on different systems and transferred between users; must be compatible with a variety of digital platforms, particularly mobile platforms used in the developing world; and must be accessible and inclusively designed to meet the needs of all learners.

LEADERSHIP: Thanks to the unwavering dedication of a core group of leaders who have helped drive supportive policies and led efforts to promote adoption, the OER field has blossomed.[63] As OER aims to transform mainstream education, the field requires more leaders spanning all domains of OER-related work. These leaders can benefit from coordination of advocacy efforts, the sharing of best practices for implementation, and a collective sense of purpose and goals. Leaders must be able to communicate effectively about OER to audiences outside the field. Gathering and sharing compelling stories of OER's benefits and developing messages that tie OER to popular causes, like the open access movement, will help cultivate new audiences. The Foundation may support general communications and marketing for OER as part of infrastructure, though communications work that targets specific audiences would fall under the pathways.

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ANCHOR INSTITUTIONS: A few core organizations house the technical capacity for OER and provide institutional support for the policy-related and technical work of individual leaders. Supporting the efforts of these institutions that serve as the field's backbone is crucial. The Foundation will act to ensure anchor institutions have strong leaders, strategic and adaptive capabilities, financial health and sustainability, effective external engagement, and reliable operations.[64]

RESEARCH CAPACITY: Because the OER field is still relatively young, its research base, while positive, is still small. Capacity is needed to conduct research on vital questions, such as the impact of open materials on student learning and the effectiveness of different paths to scale. While specific research questions and projects may be supported through the Foundation's pathways, basic capacity for research is a broader component of the field's infrastructure.

OER infrastructure efforts will address specific capacity issues in areas in which the Foundation is working and will also support field building for these infrastructure components, prioritizing areas where there are clear gaps and barriers to success.

5.

MANAGING *the* STRATEGY *and* MONITORING PROGRESS

The Foundation is prioritizing and sequencing potential pathways based on a set of factors.

As part of the shift to a problem-based approach, the Foundation will focus its resources and attention on a limited number of pathways. By focusing on no more than three or four pathways at any given time—while still maintaining a pipeline of potential pathways— we can ensure that we are making sufficient investments to meaningfully address the selected problems. To make its selection, the Foundation will apply a specific set of factors. Pathways not initially selected for investments may receive exploratory grants from a small pool of opportunity funds or be broadly supported through infrastructure grants.

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The factors the program team is using to prioritize pathways in the pipeline are:

Benefits to users and the strategy: The Foundation will prioritize pathways that support its overarching OER goal of equity for underserved students. Pathways that also support other Foundation goals, such as Deeper Learning, would be especially compelling. A pathway should have a tangible, persistent benefit to potential OER users, and it could also have spillover effects like indirect benefits for other users or field building for OER.

Potential to succeed: The Foundation will invest in pathways for which there are viable existing or potential grantees, allies, and champions. It will consider the broader context for the pathway and whether meaningful progress is possible within the strategy's timeframe. Pathways that scale up solutions that resonate with potential users and have potential benefits validated by research and examples are more promising.

Philanthropy's unique role: The Foundation seeks to invest in pathways where there is sufficient momentum for success but momentum that needs philanthropic support to tip the scales in that direction. The Foundation will also be mindful of how selecting a particular pathway might influence the rest of the OER field or create transaction costs for grantees and the Foundation.

Resources for execution: The Foundation looks to pursue pathways that excite potential funding partners that can lend support in scaling to the mainstream. The Foundation will also consider whether its internal capacity is sufficient in terms of both staff and resources to invest in the pathway's success.

More detailed questions the program uses to assess each factor can be found in Appendix A. The Foundation will also prioritize potential grants within selected pathways. Due diligence for potential grantees will assess similar factors as those for pathways, in addition to considering grantees' financial strength and grant history (if applicable).

FACTORS TO PRIORITIZE PATHWAYS

BENEFITS TO USERS AND THE STRATEGY

- *Equity*
- *Impact on users*
- *Spillover effects*
- *Supports Hewlett's goals*

POTENTIAL TO SUCCEED

- *Partners*
- *Favorable context*
- *Demand*
- *Evidence base*

PHILANTHROPY'S UNIQUE ROLE

- *Momentum*
- *Effects on the field*

RESOURCES FOR EXECUTION

- *Funding partners*
- *Internal capacity*

The Foundation will work to identify and mitigate risks inherent in the strategy.

As we pursue a more focused strategy for mainstream adoption, we are mindful of a number of risks we must mitigate. We expect that the greatest resistance to mainstream adoption will come from publishers whose business models will be threatened if we succeed. Many publishers, however, are beginning to see the inevitable future, so as we work with our grantees to develop business models around OER, we will also work with the publishing industry to adapt their own business models to an environment in which content is increasingly accessible. We also recognize that we may be criticized for myopic thinking in concentrating so much of our OER strategy on open textbooks, but right now this form of educational content is the most often used in education systems around the world. While textbooks may someday be an artifact, today they are still commonplace so they remain our near-term focus. Our final concern is that, for now, Hewlett remains the only major funder of infrastructure in the OER field. We have to take care that by investing more significantly in pathways we do not put anchor institutions at risk. The best way to mitigate this risk will be to bring along funders who do not see themselves as OER funders but become converts to OER after seeing how it can solve the problems they seek to solve.

As OER adoption makes the jump from early adopters to mainstream adopters, it is likely that people will begin asking tougher questions about the value of openness than the early adopters have been asking. For instance, mainstream adopters may question the value of allowing their creations to be revised or have concerns about the transactional costs of appropriate attribution. Our continued funding for OER infrastructure will allow our anchor grantees to prepare for the increased scrutiny and less nuanced understanding that mainstream adoption of OER is likely to bring.

Monitoring and evaluation will track progress and guide future efforts.

Monitoring and evaluation will be essential to track progress, adapt to new conditions, and course-correct if necessary. As the Foundation develops pathways and funds grantees, the program team will identify specific indicators for each pathway based on approaches in the Foundation's Education Program and the Foundation more broadly. The Foundation will collaborate with its grantees to define relevant indicators, ensuring compatibility with specific grants and goals at all times.

HIGH-LEVEL INDICATORS WILL ASSESS THE STRATEGY'S OVERALL PROGRESS.

A set of high-level indicators will inform whether the strategy is on track. In concert with the Boston Consulting Group, the program team has created an OER dashboard that assesses the current state of the OER field using metrics, baselines, data sources, and targets. These indicators are highly aligned with the strategy's new structure, as they are divided between the K–12 and postsecondary domains and cover many of the core outcomes of the strategy (see Appendix B for a full list).

The percentage of educators, districts, and faculty adopting open resources as primary course material will likely be the most direct indicator of whether OER are reaching the mainstream. Survey research will provide this data for both K–12 and higher education. These dashboard metrics are currently U.S.-focused as international OER is geographically dispersed, and high-level indicators may need to center more on the policy environment.

Additional metrics from the dashboard that contribute to this ultimate goal of adoption can help pinpoint areas where the strategy is on or off track. For example, if content creation is increasing but educators are not discovering open materials at higher rates, the Foundation may need to redirect efforts around discoverability and technical support. On the other hand, if awareness grows but adoption does not, this might signal that additional work is required on quality, marketing, or other factors that influence educators' decisions to switch to OER.

The Foundation may also refine and refresh the specific indicators in the dashboard as new data sources become available and new opportunities emerge. For example, the Foundation could incorporate new international data sources to capture the results of the international pathways that are ultimately selected. This adaptive approach will ensure the OER dashboard always includes the best data available to track progress.

DETAILED PATHWAY-LEVEL INDICATORS WILL MONITOR GRANTEES' PROGRESS.

After deciding to pursue a particular pathway, the Foundation, in cooperation with grantees, will develop a set of targeted indicators. This will be particularly helpful to guide near-term investments as the dashboard's high-level indicators are primarily aimed at monitoring long-term progress. Pathway-level indicators can also help provide greater context in areas where it is difficult to collect dashboard-level metrics, such as in international contexts with limited high-level data. Examples of the type of indicators that could be used include:

- *Number of colleges, school districts, states, or countries adopting a particular innovation or reform promoted by a pathway (e.g., number of colleges offering a zero textbook cost degree)*
- *Volume of supply covering specific needs (e.g., percentage of K–12 grade levels and subjects with effective, Common Core–aligned open materials covering the entire year)*
- *Market penetration (e.g., percentage of children in a developing country with access to books for early childhood literacy)*

After developing a pathway's indicators, the program team will collect baseline information from grantees and other experts. Tracking subsequent progress on each indicator will help assess whether each pathway is on track or off track, similar to the set of high-level indicators above. These indicators will relate to the high-level dashboard; for instance, adoption of open textbooks through the postsecondary most-enrolled courses pathway should drive increased adoption as measured in the dashboard. Individual grantees will also continue to work with the Foundation to set grant-level metrics that assess how their progress in contributing to the pathway's goals.

Collaboration with grantees and funders will help scale results.

Collaboration is an essential component of the Foundation's vision to make OER mainstream. As part of this strategy refresh, the Foundation is searching for areas where collaboration can provide the most value around its targeted objectives.

THE FOUNDATION CAN UNITE GRANTEES AROUND SHARED OBJECTIVES.

As the strategy pivots to apply OER as a solution to concrete problems, grantees may find additional reasons to work together. The early stages of the strategy focused on field building so collaboration could arise organically, creating links between grantees that were not directed towards a particular end. Now that the strategy's pathways target specific problems, grantees may need to collaborate more directly to pursue specific goals that are out of reach for a single organization. A few principles can help guide the Foundation's support for collaboration:

Coordinate grantees by establishing a shared vision, clear goals, and integrated strategy. For grantees to effectively support one another, they must share a common vision, goals, and strategy. This can be helpful at both the field-wide level, where champions have already begun to develop a strategy to bring OER to the mainstream, and at the pathway level for the Foundation. As the Foundation makes grants within its pathways, it will ensure that grantees are closely connected to the same central goals and understand the work other grantees are doing around the pathway. In many cases, this coordination may be sufficient to support grantee-led collaboration where there are appropriate opportunities.

Look for existing networks for collaboration that could be adapted to fit the strategy if formal networks are desired. Because new networks can be time intensive and costly to create, leveraging existing networks for collaboration is ideal. In existing networks, grantees also have prior relationships and experience working together so they may be more likely to collaborate effectively than a group being brought together for the first time. If no viable network exists, the Foundation may need to build a new one and will budget for additional staff time and maintenance to launch this collaborative effort.

When using a network for collaboration, choose a level of integration that matches the network's goals. Different types of networks need different levels of integration to succeed. Looser integration can be best for networks that primarily seek to share information. For example, the Hewlett Foundation's Deeper Learning grantees are organized into clusters that meet regularly. The requirement that grantees participate in clusters helps the program coordinate its work in a particular area. On the other hand, tighter integration can be helpful when grantees need to achieve a specific goal, such as providing coordinated technical support and advocacy to scale ZTC degrees. While it can be challenging and costly to stipulate the terms of collaboration, doing so can guide grantees to achieve a specific goal.

As the Foundation plans these collaborative approaches, we will solicit feedback from grantees about which problems to target and how to structure both formal and informal networks. This input from the field will help identify areas where the Foundation and its grantees see value in collaboration.

A DIVERSE GROUP OF CO-FUNDERS CAN PROVIDE ADDITIONAL RESOURCES AND SHARE LESSONS.

A problem-based approach to OER opens up new possibilities for co-funding relationships. In addition to working with other funders who directly support OER, the Foundation now also has opportunities to collaborate with those who are focused on the specific problems that open materials may solve, such as increasing college completion rates and promoting early childhood learning. By linking funders from these different substantive interests, the group could coordinate a larger pool of resources to fight these problems, helping new solutions reach scale.

In addition, funders could exchange valuable lessons about the problems targeted by each pathway under the Foundation's new approach. Funders with a long-standing substantive focus may be able to share lessons and expertise from past initiatives, such as which paths to scale are most effective within the community college system. Similarly, the Foundation and its grantees may be able to share knowledge and expertise about OER with funders new to the field. This exchange of ideas could inform and strengthen grantmaking for the Foundation and its partners going forward.

The Hewlett Foundation is excited to continue supporting OER at a time that the field is building on its successes and transitions to solving some of the most pressing problems that teachers and students face throughout the world. With this new problem-based approach, the Foundation looks forward to many more students benefitting from the promise of OER.

APPENDIX A: FACTORS FOR PATHWAY SELECTION

BENEFITS TO USERS AND THE STRATEGY

EQUITY	Would the pathway benefit underserved populations?
IMPACT ON USERS	What type of benefit would the pathway provide (e.g., cost savings to students, improved teacher practice, student learning)? How many users would the pathway benefit, and how deep would that benefit be? Would the pathway's impact persist over time?
SPILLOVER EFFECTS	Would the pathway indirectly benefit other users or help build the OER field?
SUPPORT FOR THE FOUNDATION'S PROGRAMS	Would the pathway link to other Foundation goals (e.g., Deeper Learning) and allow the program to be flexible?

POTENTIAL TO SUCCEED

PARTNERS	Are there organizations, including existing grantees, working on the problem? If not, are there organizations that would and could work on the problem with the Foundation's support? Does the pathway have champions, powerful allies, and funder interest?
FAVORABLE CONTEXT	Does the pathway link to influential narratives beyond OER and take advantage of current opportunities? Is meaningful progress achievable within the strategy's timeframe?
DEMAND	Would the solution resonate with potential users?
EVIDENCE BASE	Do existing research and examples support the pathway's potential benefits?

PHILANTHROPY'S UNIQUE ROLE

MOMENTUM	Does this path have enough momentum to merit attention? If there is momentum, does the pathway need philanthropic investment to reach its tipping point for success?
EFFECTS ON THE FIELD	What signal would the pathway send to the field about the Foundation's priorities as a leader? Would there be transaction costs, such as letting existing grantees go, or adverse field-building consequences, such as other funders abandoning areas the Foundation used to fund?

RESOURCES FOR EXECUTION

FUNDING PARTNERS	Are there other funders willing to contribute to the pathway?
INTERNAL CAPACITY	Would the Foundation's staff have the time and ability to pursue this work?

APPENDIX B: OER DASHBOARD

K–12 INDICATORS

ADOPTION	Percentage of K–12 educators using OER as primary material; number of large districts (> 50,000 students) that adopt complete OER curriculum packages; number of states that list complete OER curriculum packages/textbooks on "Approved Resource List."

Additional indicators that contribute to the adoption goal include:

CONTENT CREATION	Percentage of K–12 educators reporting that OER is of equal or higher quality than traditional publishers' material.
CONTENT MAPPING	Percentage of K–12 educators who have discovered key grantee sites; percentage of total K–12 math and ELA courses with an "adequate" quantity of instructional materials mapped to grade, subject, and standards.
AGGREGATION	Number of K–12 grades that have complete OER curriculum packages/textbooks in specific subjects.
AWARENESS	Percentage of K–12 educators who are "somewhat aware," "aware," and "very aware" of OER.
REVIEW/QUALITY CONTROL	Percentage of rated material out of total available at major platforms.

HIGHER EDUCATION INDICATORS

ADOPTION	Percentage of faculty using OER as primary course material in at least one course; number of states/governments undertaking OER initiatives for higher education.

Additional indicators that support adoption include:

CONTENT CREATION	Percentage of faculty and chief academic officers reporting that OER is of equal or higher quality than traditional publishers' material.
CONTENT MAPPING	Percentage of faculty who have discovered key grantee sites; percentage of aware faculty who say that the ease of finding OER is equal to or better than that for traditional publishers' material.
AGGREGATION	Percentage of 50 most popular college courses with a high-quality open textbook available.
AWARENESS	Percentage of faculty and chief academic officers who are "somewhat aware," "aware," and "very aware" of OER.
REVIEW/QUALITY CONTROL	Percentage of rated material out of total available at major platforms.

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