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CHAPTER 5

Pay It Forward:

Realizing The Promise of OER for the Next Generation of Learners

Kimberly S. Grotewold, Karen L. Kohler, and Elisabeth M. Krimbill

Pay it Forward: A Ripple Effect

“Pay it forward” became a commonly used phrase and sociocultural fixture after Catherine Ryan Hyde’s 1999 novel of the same name and the subsequent movie released in 2000 featuring prominent actors and celebrities. Particularly in the United States, society recognizes the phenomenon of people paying for occupants’ orders in the next car at drive-through windows as enactments of the pay-it-forward mindset. This is largely due to news media outlets publicizing long chains of cars lasting multiple hours at well-known commercial establishments such as Starbucks.¹ According to the former Pay It Forward Foundation’s website, the foundation was established “as a catalyst to inspire growth for the Pay It Forward philosophy, acts of kindness among strangers, generating a ripple effect from one person to the next, one community to the next.”² The benefits of open educational resources (OER) adoption, modification, creation, and use in various education settings clearly extend beyond what one would categorize as a “kindness,” and specifically in the context of PreK-12 education, it is possible to truly imagine the power and potential of a “ripple effect” spreading community-to-community but also from one generation of learners to the next.

Cost Savings for PreK-12 Students

As some readers are likely aware, the United Nations Educational, Scientific, and Cultural Organization (UNESCO) defines OER as “teaching, learning and research materials in any medium—digital or otherwise—that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation, and redistribution by others with no or limited restrictions.”³ Part of what initially attracts interest in OER is the “no-cost” aspect.

Cost reduction for individual students and the collective student body is a benefit associated with the adoption and use of OER to replace expensive textbooks and other instructional materials in higher education. There have been various, widely publicized reports on the huge increases in textbook prices for college students, looking at ranges of years from 1978–2013 and 2006–2016, and OER is seen as an option for reducing individual students’ expenditures.⁴ Because students in PreK-12 public schools in the United States are often not required to purchase their textbooks or curriculum resources themselves, it is harder to recognize and perhaps realize reduced costs as a benefit. One 2017 calculation of the average spending on textbooks and instructional materials by K-12 school systems was \$250/student annually, although this number seems to be based on 2013/2014 data.⁵ Another article puts K-12 non-digital curriculum spending at \$10.4 billion for the 2014–2015 academic year and \$1.8–\$4.8 billion⁶ of spending on digital content in the previous year. For large school systems, this adds up to significant funds expenditures. Particularly for school systems in economically challenged areas, OER could be a district-level cost-saving measure. A 2017 study of school systems in the United States and the factors that drive curriculum materials adoption decisions found that the cost of the materials was of more concern when larger percentages of the school’s student population had been identified as living in poverty.⁷ At least, in theory, funds that are not being spent on instructional materials could be diverted toward other resources in support of students, which may be particularly important in schools serving impoverished students and families.

During the fall of 2015 and early 2016, the United States Department of Education launched its #GoOpen initiative. A main goal of the initiative was to promote access to and creation of “high-quality openly licensed educational resources” and supports—specifically, free resources with the “5R” permissions fully enabled. These 5R permissions allow users to retain, reuse, revise, remix, and redistribute the materials to best suit their needs.⁸ The #GoOpen website advocates that “switching to openly licensed educational materials has enabled school districts to repurpose funding typically spent on textbooks for other pressing needs, such as investing in the transition to digital learning.”⁹ During

the current COVID-19 pandemic, it is relatively easy to envision how funding saved from textbook purchases might be used to purchase additional computers for students' home use, MiFi units, or augmented WiFi access at schools and surrounding areas. Prior to the #GoOpen initiative, the Office of Educational Technology issued a Dear Colleague Letter to clarify that federal funding could be used to “support innovative technology-based strategies” across four areas:

1. improving and personalizing professional learning and other supports for educators;
2. increasing access to high-quality digital content and resources for students;
3. facilitating educator collaboration and communication; and
4. providing devices for students to access digital learning resources.¹⁰

Within this letter, open educational resources were specifically noted in a section on using Title II-A funds for providing teachers with training on finding and adapting relevant openly licensed college- and career-ready resources.¹¹

Within the #GoOpen initiative framework, there are both #GoOpen States and #GoOpen Districts. There were originally fourteen #GoOpen States, a number that eventually grew to twenty.¹² Among #GoOpen Districts, there have been both Launch Districts and Ambassador Districts, with the total number of participating districts beginning at sixteen and growing to more than 120. Ambassador Districts are districts with more experience in adopting and developing OER, which serve as mentors to the Launch Districts.¹³ Additionally, as part of its open education efforts, the Department of Education has issued regulations to require that all Department of Education grant awardees must openly license and make available to the public all copyrightable intellectual property that was created with the grant funding. While works created under an awarded grant may have initially been designed to benefit specific students, the department concluded that “the resources are such that other education stakeholders would significantly benefit from being able to access them, reuse them, and in some cases, modify them to address their needs and goals.”¹⁴ These important initiatives have the potential to improve educational resources, allow for more equitable access, and disrupt a funding system in which textbook publishing monopolies have exerted disproportionate influence over curriculum materials for decades.

El Paso Independent School District (ISD) in Texas, currently listed among the #GoOpen Ambassador Districts, began its work with OER in 2013, at a time when it had just adopted new science curriculum materials. Purchases of textbooks for 18,000 students to address the curricular changes were projected to cost \$2 million, pushing school system administrators to consider whether there

might not be better ways to provide students with access to the needed content while expending scarce resources differently. The district began working with the CK-12 Foundation to develop OER science instructional materials covering the disciplines of chemistry, biology, and physics and aligned to the Texas state curriculum standards. Later, El Paso ISD teachers also curated materials from other sources, such as OpenStax, to develop open resources for more subjects, including math and social studies.¹⁵ Digital textbooks (called Flexbooks), online study guides, simulations, and gamified exercises (called PLIXs—Play Learn Interact Explore) are among the materials available for use and modification on the CK-12 website.¹⁶ Tim Holt, El Paso ISD’s executive director of blended learning at the time, described a meaningful process shift when he noted, “Instead of us matching our curriculum to a pre-made textbook, we’ve done it the other way. We’ve made the textbook to match our curriculum.”¹⁷ Creating or selecting a textbook that aligns with the curriculum is the approach that best mirrors the instructional planning practice of starting with intended student learning objectives and then selecting materials and activities to facilitate that learning.

Culturally Responsive Teaching

The remixing right, which is one of the 5R permissions inherent in open educational resources, sets forth the promise that teachers can adapt instructional materials to best meet the needs of their specific students with all their unique characteristics. Researchers, particularly those affiliated with the Open University in the United Kingdom, have studied efforts to “localise” [sic] content in India and Sub-Saharan Africa in part to determine what supports are most likely to produce successful collaborative efforts and meaningful content adaptation or reinvention and how the practices of the educators’ who worked on the “localisation” projects shifted to be more child-centered.¹⁸

In the United States, culturally responsive teaching includes similar efforts to localize instructional content. Dating back to the 1970s, educators, such as Geneva Gay, advocated for culturally responsive teaching practices in America’s PreK-12 schools. These practices are closely connected to funds of knowledge and asset-based pedagogy in that the emphasis is placed on educators seeing culture and diversity as assets rather than deficits, which children bring to the classroom.¹⁹ Many researchers use culturally relevant, responsive, and culturally sustaining teaching and pedagogy interchangeably; it is important to note the nuances between culturally relevant teaching and pedagogy. Teaching focuses on competence and practice, while pedagogy affects disposition and attitude.²⁰ For the purpose of this chapter, we use the term culturally responsive teaching (CRT) as defined by Gay:

Culturally responsive teaching is the behavioral expression of knowledge, beliefs, and values that recognize the importance of racial and cultural diversity in learning. It is contingent on seeing cultural differences as assets; creating caring learning communities where culturally different individuals and heritages are values; using cultural knowledge of technically diverse cultures, families, and communities to guide curriculum development, classroom climates, instructional strategies, and relationships with students; challenging racial and cultural stereotypes, prejudices, racism, and other forms of intolerance, injustice, and oppression; being change agents for social justice and academic equity; mediating power imbalances in classrooms based on race, culture, ethnicity, and class; and accepting cultural responsiveness as endemic to educational effectiveness in all areas of learning for students from all ethnic groups.²¹

CRT demands a shift in teachers' practices. No longer could it be enough for a school merely to celebrate particular heritage months during the academic year. Instead, CRT calls teachers to ensure that the vastly rich cultural experiences, identities, demographics, racial, and historical backgrounds of students in the classroom are reflected in the curriculum. Doing so means that all students have the opportunity to feel valued and engaged in unbiased, cultural instructional materials. Gay suggested that teachers evaluate textbooks as one way to become competent in implementing CRT.²² OER presents teachers with opportunities to transform existing materials into curricular content that recognizes and uplifts students' own experiences. Traditional textbooks may not fit the unique cultural, demographic makeup of a classroom, so replacing them with more readily adaptable OER can help educators make materials more inclusive and accessible.

The state of Washington has adopted this change in thinking and created the Washington K-12 Open Educational Resource Project, which is housed within the Washington Office of Superintendent of Public Instruction (OSPI), "the primary agency charged with overseeing public K-12 education in Washington state."²³ Washington state's OER work began in 2012 and continues today. The state has curated an impressive collection of OER in its Washington OER Hub (an OER library) through collaborative efforts across PreK-12 districts, universities, and organizations statewide. Within the Washington OER Hub, there are resources to introduce teachers to OER and help them effectively search and adapt materials.²⁴ Also of note, the Washington OSPI provides financial grants to support K-12 OER content development.²⁵ One notable OER project features the American Indian and Native Alaskan population who made up approximately 1.9 percent of the population of Washington state in 2019.²⁶ The OSPI worked

with various agencies and the federally recognized tribes of Washington to create the materials for the project, which carries the name “Since Time Immemorial: Tribal Sovereignty in Washington State.” The “Since Time Immemorial” (STI) resources are predominantly open-licensed and serve as learning materials for students ranging from Pre-K through high school and allow teachers to meet the state requirements for teaching tribally developed curriculum. The STI curriculum website also includes implementation resources for teachers and information about how the curriculum must be integrated into teacher and administrator preparation programs in Washington state. One approach to the curriculum content is inquiry-based learning focused on essential questions where teachers and students are encouraged to consider the questions in relation to the tribes in their communities.²⁷

Textbooks produced by commercial educational publishers cannot accurately represent every cultural background that may be part of a school or classroom community. Even attempts by large publishers to create state-specific editions of curriculum materials are likely to miss the mark of full inclusivity. Nor can such textbooks incorporate real-time news in the making as it occurs—the COVID-19 pandemic being an obvious example. OER can mitigate these shortfalls because teachers can contextualize content and align it with curricular goals to address students’ interests and actual cultural backgrounds.²⁸ Teachers can take this practice of ensuring curricular materials represent their students a step further by directly incorporating students’ voices and work. David Wiley, often considered the founder of OER, would likely recognize such a practice as moving toward non-disposable, “renewable assignments,” assignments or activities that have value beyond their submission for a score or grade and which often reach a broader audience than just the teacher and a single class of students.²⁹ OER is an excellent solution to infuse CRT practices into the classroom. States like Washington have been, and remain, at the forefront of building OER awareness among educators, providing access to locally developed, culturally responsive resources, and offering training on effectively finding and using openly licensed materials.

OER as Way to Provide Pre-service Teachers with Access to Currently Adopted Instructional Materials

The concept of what constitutes an effective educator preparation program has been and still is the subject of research and debate. Search library databases and catalogs for resources on this topic and lists of thousands of articles and books

are retrievable. Additionally, PreK-12 education professional organizations have developed numerous sets of teacher, administrator, and other specialist standards that influence instruction in higher education programs designed to prepare college students for these roles.³⁰ Additionally, individual states establish educator credentialing requirements, which also drive teacher preparation curricula. Less open to argument is the idea that the goal of educator preparation programs is to generate high-quality professionals ready to work with students to promote learning.

In March 2020, the global epidemic of COVID-19 forced an unprecedented number of PreK-12 school systems to shift their mode of instructional delivery to primarily online, at least for a period of two to three months. Recent data showed that across North America, PreK-12 schools were closed or partially closed to in-person learning for thirty-one to forty weeks between January 2020 and January 2021.³¹ After the close of the 2019–2020 academic year, many school systems elected to offer their families the options of fully online or hybrid learning. While this rapid shift of operations affected a huge swath of the global population of PreK-12 students and communities, some districts and systems already had the infrastructure and technologically competent teachers to meet the challenges of the new educational environment. Even prior to COVID-19, numerous school systems worldwide had already been making use of online instructional materials and learning management systems; however, this was not necessarily the norm.

Access to quality resources plays an important role in teacher preparation. Pre-service teachers who are students in college/university educator preparation programs have their academic library materials available to them. They may also have access to a specialized curriculum library through their education department, depending on its size. Curriculum libraries often contain resources such as print copies of teacher and student editions of PreK-12 textbooks and workbooks, manipulative kits, classroom reading collections, educational models, puppets, etc.³² When school systems adopt online instructional materials for use with their students, they typically purchase licenses through large educational publishers, such as Pearson or McGraw Hill. While portions of these resources may be available without a license, access is typically highly restricted. Frequently, curriculum libraries are unable to secure licensing for pre-service teachers who are unaffiliated with a specific PreK-12 school system. The result is that for at least part of their preparation programs, these teacher candidates will not have access to the instructional materials that are being used in the districts where they are likely to be working in the future.³³ Of course, pre-service teachers can use other materials for their lesson planning and curriculum-related course

assignments, but having access to materials currently in use, and in the correct media format, would arguably be highly advantageous for their preparation.

The adoption of OER by a PreK-12 school system or state solves the problem of pre-service teachers' limited access to curriculum materials that are currently in use. The Affordable Learning Georgia initiative and the GALILEO Open Learning Materials site are well-known to those working with OER in higher education.³⁴ What may be less known is that in 2016, Georgia was one of fourteen states to make a #GoOpen commitment during the first state-focused round of the Department of Educational Technology/ISKME OER partnership targeting PreK-12 education.³⁵ The Georgia Virtual Resources/Georgia Virtual Learning (GaV) site was an outcome of the #GoOpen project.

According to the GaV site, "589+ Georgia and out of state schools used GaV in 2019–2020."³⁶ The GaV site organizes materials by subject and grade level. Within each grade level, standards-aligned shared resources are offered. One of the larger groupings is Middle School Language Arts, 6th Grade, which includes twenty-one instructional modules.³⁷ The first module in this section provides an example of how the content is organized. It is titled "Introduction and Novel: *The Watsons Go to Birmingham*." The module's opening screen includes a column on the right where relevant standards are linked. In this case, the links are to a Georgia-specific set of Novel Introduction Standards for 6th Grade English Language Arts and to a Technology Standards document from the International Society for Technology in Education (ISTE).³⁸ The modules are generally structured for independent learning, although some have discussion topics and other activities that encourage interaction and collaboration. Additional modules are provided across the secondary (grades 6–12) subject areas of math, science, fine arts, social studies, world languages, and career and technical education. The GaV site additionally offers professional development learning modules aimed at a teacher audience. There are no license barriers to pre-service teachers in Georgia (or elsewhere), preventing them from adopting and using these materials in their coursework, teaching demonstrations, and other preparation program activities.

OER and Digital Equity for Pre-service Teachers

The adoption of OER by PreK-12 school districts can benefit pre-service teachers doing their teacher preparation in those communities by giving them free access to the same instructional materials as employed teachers are using with their students. This access alone is one step toward equity; however, because OER

are typically online instructional materials, there are issues around technology, which need to be considered. Terms, such as “digital divide,” have frequently been used too simplistically to describe the differences between communities where students’ families are likely to have internet and computer access at home versus those where computers and connectivity are less prevalent.³⁹ More recently, and particularly as the COVID-19 pandemic has gripped the world, educators and scholars have grown increasingly aware of the multifaceted challenges inherent in achieving greater digital equity and inclusion among schools, students, and families. Beyond access to computers and other technological devices, PreK-12 teachers’ competencies in effectively integrating technology into their instructional practices have become part of the conversation around digital equity. In their book *Closing the Gap: Digital Equity for Teacher Prep Programs*, a publication of ISTE, authors Howard, Schaffer, and Thomas make a strong case that in education, digital equity includes “skilled, digitally literate teachers comfortable with incorporating technology into instruction”⁴⁰ Comfort level likely influences teachers’ motivation and willingness to use technology in instruction, and while there may be correlations between teachers’ self-reported comfort level and their frequency of technology usage in instructional situations, frequent technology use does not necessarily equate to the effective integration of technology.

Some scholars suggest that teachers’ effective technology integration differs from successful technology use by other professionals, or even that successful technology integration by teachers has particular subject-specific dimensions. For example, art teachers’ instructional technology use should not look exactly like that of science teachers. Approximately twenty-five years ago, Shulman made the argument that teachers’ pedagogical content knowledge (PCK) would vary by discipline so that pedagogy and content must be considered together in teacher preparation.⁴¹ Later, Mishra and Koehler extended this idea and introduced a technological component into the model, thereby converting the acronym and the framework to TPCK and, finally, to TPACK. It is helpful to see a visual representation of the TPACK framework (figure 5.1) to fully understand how the proposed teacher-required knowledge areas intersect.

Looking at the TPACK diagram, it becomes useful to think about where OER fit into the picture. As previously noted, OER are generally understood to be accessed online and then remixed and redistributed digitally.⁴² Therefore, to access, and more importantly, to use OER successfully, teachers need to have some level of technological expertise. This technological expertise is represented most basically in the TPACK figure by the T circle, which demonstrates overlap with both the content (C) circle and the pedagogical (P) circle. One of the groundbreaking aspects of TPACK was the emphasis on the areas of intersection in the model. Rather than considering each of the knowledge types as functioning

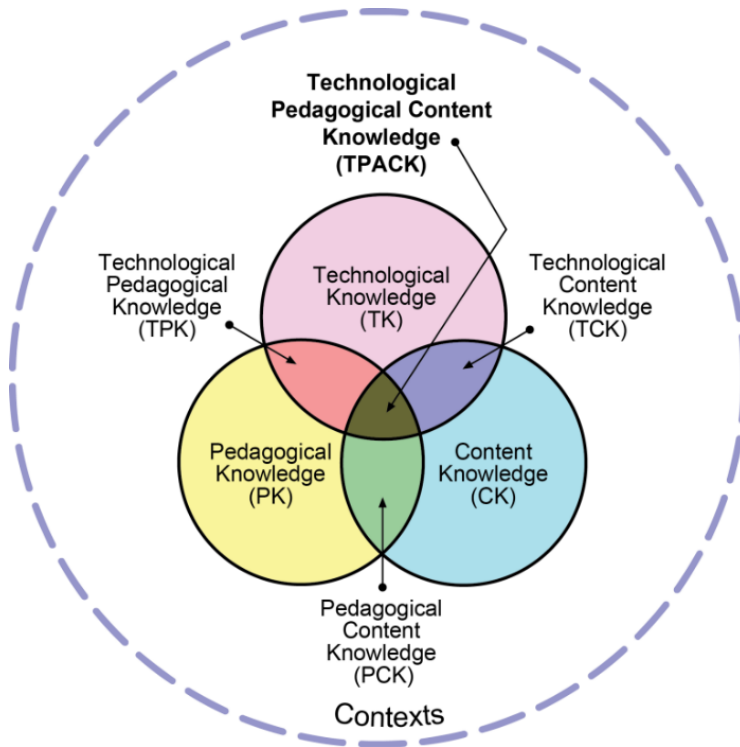


Figure 5.1

TPACK diagram reproduced with permission of the publisher, © 2012 by tpack.org.⁴³

independently in instructional practice, all the intersection points are worthy of attention—so pedagogical content knowledge is different from what pedagogical knowledge and content knowledge represent in isolation. Mishra and Koehler describe the overlap of all three circles or the culminating level of the model—Technological Pedagogical Content Knowledge—as involving “a nuanced understanding of the complex relationships between technology, content, and pedagogy and using this understanding to develop appropriate, context-specific strategies and representations. Productive technology integration in teaching needs to consider all three issues not in isolation but rather within the complex relationships in the system defined by the three key elements.”⁴⁴

We, the authors of this chapter, propose that understanding of OER and OER-enabled practices be recognized as an additional subset of knowledge within the Technological Pedagogical Content Knowledge region. See the addition shown on the TPACK diagram in figure 5.2.

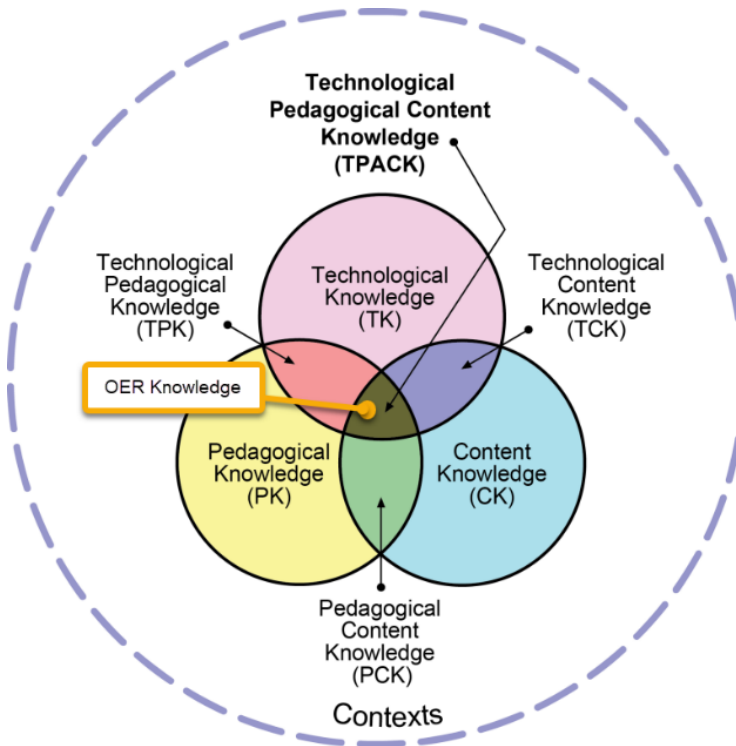


Figure 5.2

TPACK diagram reproduced with permission of the publisher, © 2012 by tpack.org⁴⁵ with addition by Grotewold, Kohler, and Krimbill, 2021.

In order to know what types of reuse and remixing are allowed regarding identified OER, educators should have a basic understanding of “traditional” copyright and alternative forms of content licensing. Creative Commons.org has developed the most common form of alternative licensing. Understanding the varying levels of permissions can be challenging and requires study and practice.

The chart in figure 5.3 explains the ways users can employ materials that display the Creative Commons (CC) licensing symbols and the corresponding expectations regarding crediting the creator, making changes, and re-sharing the works. The specific information in the chart is likely not widely known by the general public nor by pre-service and in-service teachers. Training opportunities to learn about existing CC-licensed materials and OER resource repositories could broaden teachers’ awareness of these tools and their possibilities. Still, repeated exposures and consistent use are likely needed for teachers to truly incorporate them into their regular practices.

Creative Commons Licenses Quick Reference

	COPY & PUBLISH	ATTRIBUTION REQUIRED	COMMERCIAL USE	MODIFY & ADAPT	CHANGE LICENSE
Public Domain	✓		✓	✓	✓
 Attribution (CC BY)	✓	✓	✓	✓	✓
 Attribution-ShareAlike (CC BY-SA)	✓	✓	✓	✓	
 Attribution-NoDerivs (CC BY-ND)	✓	✓	✓		✓
 Attribution-NonCommercial (CC BY-NC)	✓	✓		✓	✓
 Attribution-NonCommercial-ShareAlike (CC BY-NC-SA)	✓	✓		✓	
 Attribution-NonCommercial-NoDerivs (CC BY-NC-ND)	✓	✓			✓




Figure 5.3

Creative Commons Licenses Quick Reference Chart image by SUNY OER Services is licensed as CC BY.⁴⁶

The Open High School of Utah, founded in 2007 by David Wiley, was an early attempt to engage teachers and students in the regular adoption, modification, and creation of new OER for use as the sole instructional materials for courses. Wiley and colleagues Tonks, Weston, and Barbour described the history of online learning in K-12 education, which led to the launch of Open High School and analyzed Open High's first four years of operation with students from 2009–2013. The high school differed from other online schools at the time because it stated in its original operating policies that it would rely entirely on OER for its instructional materials rather than purchasing commercial publisher materials. Its charter also indicated that it would make its courses freely available online. In their analysis, the authors noted advantages of OER curricula, such as quick adaptability for meeting students' learning needs—specifically special education students' requirements for content in multiple formats and potential cost savings associated with the whole school functioning openly. Conversely, they also saw logistical challenges. One of the final statements in the article articulated the potential issues surrounding teachers' technological competencies and knowledge of licensing:

We hope every teacher possesses the skills necessary to successfully use curriculum materials and educational media in support of student learning. However, successfully using OER requires teachers

to possess additional information literacies that will enable them to find and evaluate the quality of OER and additional technical skills that will enable them to take full advantage of the “4R” permissions granted by open educational resources.⁴⁷

Other researchers, and particularly Kimmons, who is currently a colleague of Wiley’s, have explored teachers’ use of technology as it applies to open educational practices and specifically OER-enabled practices.⁴⁸ Kimmons carried out a study while at the University of Idaho on how best to develop teachers’ “open education literacies.” At the time, he found “Open education is a new concept to most K-12 teachers and administrators, and knowledge and skills necessary for effectively utilizing and creating open educational resources are not standard topics of teacher education courses or professional development trainings.”⁴⁹ To address this gap, Kimmons and colleagues planned and carried out three-day-long Technology and Open Education Summer Institutes. Pre- and post-survey data gathered and analyzed from eighty K-12 teachers revealed that participants tended to over-estimate their prior knowledge of concepts like copyright, fair use, and open licensing. Then, it was through professional development that they learned what these terms actually mean. Kimmons explained why this finding suggests a possible obstacle in the way of connecting teachers with additional learning covering OER-related practices and therefore may be damaging to momentum in the PreK-12 OER movement: “If teachers already believe that they understand copyright and fair use, for instance, then they have no impetus to learn about these concepts and may consider themselves to be open educators when in fact they have very little understanding of what this entails and what it means to share in open ways utilizing copyleft or Creative Commons licensing.”⁵⁰

Kimmons’ subsequent work individually and with colleagues tended to be more encouraging regarding teachers’ establishment of a knowledge framework that would allow them to realize the pedagogical benefits associated with OER use. Mason and Kimmons conducted a mixed-methods study, which included surveys and interviews of 7th–12th-grade teachers using open science textbooks. They found that most study participants rated the open textbook as better than the publisher-supplied textbook they had previously used. They also reported positive changes in their instructional practices resulting from their switch to an online OER, such as increased collaboration with other teachers. Finally, although the instructors recognized the value of remixing the OER content, some reported reluctance to make “in-the-moment” changes due to lack of time or an instance where a technical issue caused changes not to show up.⁵¹ This again suggests a need for teachers to be technologically savvy or for there to be support systems in place to help them navigate potential issues.

Pre-Service Teachers and Administrators at Our Institution

The authors of this chapter are Kimberly Grotewold, an academic librarian and subject research specialist for education (a.k.a. the Education Librarian); Dr. Karen Kohler, an assistant professor of curriculum and instruction; and Dr. Elisabeth Krimbill, an assistant professor of educational leadership, who all work at the same young, urban, regional university. This university is recognized as a minority-serving institution (MSI) and, more specifically, an Hispanic-serving institution (HSI), with 72 percent of the student body identifying as Hispanic/Latino and 77 percent as first-generation college students.⁵² The institution has strong ties to the community in which it is geographically located, and the university president regularly affirms a commitment to elevate and provide increased educational and economic opportunities for this community. The student body demographics at the university, and more specifically within the College of Education and Human Development, largely reflect those of the surrounding local community and rapidly expanding metropolitan areas beyond it.⁵³ We, the authors, feel that it is essential to situate our OER-related efforts within this context.

During the past two years at our institution, we have engaged in a dual-faceted approach to building awareness of OER and its promises for PreK-12 education. One of the facets has involved introducing pre-service teachers to Creative Commons licensing, public domain resources, fair use concepts, and OER during a legal and ethical issues in education course taken by all undergraduate education majors. The other spur of our efforts has employed OER and other freely available materials to replace commercially published textbooks in a graduate-level educational leadership course.

OER Instruction and Research Collaboration: Kimberly Grotewold, Education Librarian with Dr. Karen Kohler and Undergraduate Education Students

New to the position of education librarian at the university in summer 2018 and coming from a vastly different institution, I was initially cautious in my library instruction undertakings, generally keeping session topics and explorations

similar to what I thought had been done in the past. One of these was the “copyright for teachers” lesson. After presenting the lesson a number of times, mainly using lecture format in a face-to-face classroom setting, I yearned to move away from an emphasis on avoiding copyright infringement and toward a more positively framed approach that would present alternatives to “traditional” copyright, such as the open licensing options developed by Creative Commons.org. I was also thinking about experimenting with creating an online tutorial to teach the content. Around this time, I met Dr. Karen Kohler, assistant professor of curriculum and instruction, who was also relatively new to the university and is another author of this chapter. Together, we embarked on a partnership that incorporated both changes—the development of an interactive, online instructional tutorial and a shift in the material covered to include Creative Commons licensing and OER. Our collaboration also led to a successful grant proposal in spring 2019 and, with additional teammates, the construction of an OER module for pre-service and in-service teacher professional development. The grant was funded by an organization that aims to increase diversity in the teaching profession through support of teacher preparation programs at MSIs across the country.⁵⁴ The grant-sponsored training prompted us to consider how to address assessment of OER in relation to equity in both our module and in our instructional unit and inspired our inclusion of content on visual literacy.

In another extension of this OER work, we drafted a plan for a research study to (1) determine our educator preparation program students’ awareness of, and specific knowledge concerning, Creative Commons licensing, public domain, fair use, and OER before and after they experience the new instructional tutorial and corresponding in-class activities, and (2) evaluate the effectiveness of the tutorial plus synchronous instruction session approach in teaching this content. By the time this chapter is published, we will have completed a pilot round, and a slightly modified, expanded round of our study. Both rounds of the study consisted of five major parts: (1) a pre-instruction survey, (2) an online tutorial,⁵⁵ (3) an in-class review and group activity, (4) a post-survey, and (5) written student reflections. The total number of students who engaged in at least one aspect of either round of the study was more than one hundred.

From the first pilot study, Dr. Kohler and I noted that the participating education students did not have a strong understanding of the relationships between copyright, fair use, Creative Commons, and OER, both before and after completing the tutorial. We adjusted our in-class instructional approach and increased the time between pre-survey and post-survey implementation for the next semester, and we hoped to collect improved and more robust data from a second iteration of the study. Unfortunately, due to a weakness in the pre- and post-survey data collection, we could not accurately analyze our data for change.

An additional challenge was that we received approximately half the number of completed post-surveys as pre-surveys, so there was a marked drop-off in participation at the end of the study.

Based on our interactions with students during the synchronous class instruction sessions and reading through students' end-of-unit reflections, Dr. Kohler and I made informal observations on students' reactions and sentiments about the unit. First, one student commented that the content related to copyright, public domain, fair use, Creative Commons, and OER was very "dense." Students taking the legal and ethical issues course in which we situated the unit generally come from various specialties across our institution's educator preparation programs, and few students seemed to have prior knowledge of the content related to Creative Commons licensing and other content sharing options presented in the unit. Second, while the majority of the online tutorial was on alternatives to traditional copyright, such as CC licensing, and how to appropriately attribute images and other content, students' reflections emphasized concern about legal ramifications for violating copyright and school districts possibly owning work they have created. Third, education students' apparent distress at potentially not having ownership of lessons or activities they develop shows some movement toward recognition of themselves as content creators, but so far we have seen students express limited enthusiasm for the benefits of remixing openly licensed materials and the value of sharing their work using the permissions afforded by CC-licensing. We recommend further study of this issue in the future. We are not aware of these topics being covered in many, if any, of students' other educator preparation courses. We are left wondering if more sustained exposure to the topics of copyright, public domain, fair use, Creative Commons, and OER throughout educator preparation curricula could be influential in shifting future teachers' perceptions and attitudes.

Dr. Elisabeth Krimbill's Experience Implementing OER with Pre-service Administrators

The other author of this chapter is Dr. Elisabeth Krimbill, assistant professor of educational leadership, who has grown in awareness of OER and has revamped her courses to realize the benefits of OER and OER-enabled practices. Here is her story:

I was introduced to open educational resources (OER) during a college faculty meeting. As a previous K-12 administrator, I was unaware of the depth and breadth of the variety of openly licensed educational resources available to me in my new role as a college professor. I was impressed by the content, quality, and availability of the OER textbooks relevant to the courses I teach. One, in particular, *Social Science Research: Principles, Methods, and Practices*,⁵⁶ seemed to be a perfect fit for my course. Although it was framed broadly to cover various types of social science research, it covered all of the key content specific to educational leadership and was available to my students free of charge. The standard textbooks often used for this course ranged between \$85 and \$150, and this book was free! My students were so excited to have access to this content, particularly in light of the financial burdens they were already encountering in the degree program.

The OER allowed me to provide the text, plus professor-created outlines, key content presentations, and assignments that I created to assist in student mastery of the material, in a cost-effective manner. This OER encouraged users to add material, thereby expanding the resources available to my students and others who might find and adopt the text. This collaborative approach has the potential to impact social justice initiatives by providing students in under-funded, under-represented communities with the resources they need to access greater educational opportunities.

For one of the assignments I created to align with the text, the students created their own OER resource file of educational research data sets and analysis worksheets. The students had a unique opportunity to publish their own work in an OER learning environment, which allowed them to share their own voices and research interests in the field of education. Under-represented populations may not be included in the development of traditional textbooks, but in an OER environment, they can explore and add to the body of knowledge in a manner previously unavailable to students and most professors.

OER can be very useful for professors and teachers at every level. Table 5.1 is an example of how I implemented the 5R OER permissions⁵⁷ and engaged in OER-enabled practices with my pre-service school administrators.

Step	Description	Activity
Step 1	Retain: The right to make, own, and control copies of the content.	<p>Professor searched for appropriate OER materials.</p> <ul style="list-style-type: none"> • OER Commons • OASIS • Merlot • Vimeo • Open Textbook Library <p>Professor reviewed carefully and to ensure alignment with course standards and objectives.</p>
Step 2	Reuse: The right to use the content in a wide range of ways.	<p>Professor created supporting resources to support student access and generated a greater variety of modalities to support student learning.</p> <ul style="list-style-type: none"> • Outlines of each chapter • Narrated PowerPoint presentations to review the content in audiovisual format
Step 3	Revise: The right to adapt, adjust, modify, or alter the content itself.	<p>Professor added material for other users.</p> <ul style="list-style-type: none"> • Terminology matching cards • Action Research Procedure Guide
Step 4	Remix: The right to combine the original or revised content with other material to create something new.	<p>Professor developed three online tests (multiple-choice and T/F) to assess student mastery of the content.</p> <ul style="list-style-type: none"> • Students collaboratively created note-taking tools and worksheets. • Students were allowed to use their notes on the tests.
Step 5	Redistribute: The right to share copies of the original content, your revisions, or your remixes with others.	<p>Professor set up structure for students to add content to OER.</p> <ul style="list-style-type: none"> • Students created their own data sets and statistical analysis worksheets and uploaded them to a resource file for classmates to complete.

Table 5.1

An example of OER-enabled practices.

Next Steps: OER in Pre-service Teacher Programs in the United States

In the process of researching for this chapter and the other OER work happening within our own college of education, we have noticed a few patterns. OER awareness, adoption, modification, and use in PreK-12 education seems to be higher and generally of greater interest to countries outside the United States, particularly in countries where access to education is not as ubiquitous.⁵⁸ The International Association for K-12 Online Learning (iNACOL) released a report in 2013 touting the potential for OER to address a need in the United States for collaboratively reimagined curricular materials to align with the establishment of Common Core State Standards while also noting possible obstacles.⁵⁹ Four years later, a Babson Survey Research Group report from 2017, which analyzed data on curriculum materials adoption processes from representative K-12 school systems in the United States, found that only 16 percent of districts had adopted “open licensed full-course” curricular materials.⁶⁰ Blomgren’s and MacPherson’s conclusion in 2018, based on their systematic review of the previously published research literature, was that OER in K-12 education in the United States in Canada was in the “nascent” phase corroborates this finding.⁶¹

Another recent, intriguing study included the United States, among many other nations, both Western- and non-Western, and situated OER adoption and use for particular purposes in the context of cultural characteristics. Tang and Bao (2020) examined survey results from 675 K-12 teachers representing seventy-two countries to try to better understand which societal and cultural factors might affect successful OER adaptation and use. Of particular note was the researchers’ application of Hofstede’s six cross-cultural dimensions to explain societal differences among countries. Through regression analyses of the survey data, interesting positive correlations emerged: Teachers from countries where individualism is prioritized over collectivism were more likely to face both issues with access to OER and problems with adaptation, perhaps due in part to a lack of coordinated and supportive policies. Second, using Hofstede’s masculinity versus femininity dimension, their analysis found a positive relationship among high masculinity countries and difficulty with successful OER integration. They speculated that the focus of masculine-oriented countries on competition and assessment, often tied to state or national standards, may pose obstacles for OER adoption.⁶² Because Hofstede’s dimensions can be judged as subjective, it is difficult to claim definitive conclusions based on the Tang and Bao study, but it does present a different lens through which to view the evaluation of OER

utilization in K-12 education, and it encompasses data from around the world, which should not be ignored.

A second pattern in the research to emerge is that most attention in the United States has been paid to developing practicing teachers' OER knowledge. Kimmons, Wiley, Hilton, and others who are well-known names in the North American OER landscape have tended to center their efforts on employed teachers in K-12 classrooms.⁶³ Research involving college and university students who are studying to become teachers and school administrators is less abundant. Two years ago, we, as authors of this chapter, surmised a lack of OER awareness among our local educator preparation program faculty members and students, which catalyzed our interest in both building awareness at our institution and adding to the body of literature. At the beginning of our efforts, we became aware of an academic librarian-educator preparation faculty duo, Katz (librarian) and Van Allen (education faculty member) doing inspiring work through CUNY in New York. Their work has so far yielded a decision-making framework for the process of replacing commercial curriculum materials with OER in educator preparation courses and some strong qualitative reflections from students on their engagement with the OER materials.⁶⁴ Other work of interest to us is a 2018 literature review by Kim, which describes possibilities for integrating OER into teacher education programs using distributed cognition and example-based learning modalities.⁶⁵ Van Allen and Katz's efforts in New York, a state like Texas in that it was never listed as a #GoOpen state, may offer us helpful insight into how to develop and support pre-service teachers in OER use and creation without the direct scaffolding of the #GoOpen model.

Although the endeavor is not without challenges, we hope that introducing pre-service teachers and administrators to OER and OER-enabled practices builds foundations for greater digital equity and amplifies teachers' and students' lesser-heard voices. Acquainting students in educator preparation programs with OER and its potential for customization and working with them to acquire content licensing knowledge and the requisite technological proficiency will allow these students to step into the profession of teacher or school administrator with a specialized toolkit. The tools in this kit can help them reframe school budget conversations to evaluate priorities more effectively when it comes to adopting and/or purchasing curricular materials, ensuring that the value is at least commensurate with the cost. These new professionals may advocate for increased sharing of resources and expertise to most effectively meet the needs of their schools and communities. Ultimately, as OER-enabled teachers and school leaders, they may pass this understanding on to their students, who can carry on an open knowledge and innovation cycle, paying the benefits forward to the next generation of learners.

Authors' Statement

The authors acknowledge that we are writing from the perspective of privilege. We hope that others, particularly those whose voices have been marginalized, are able to authentically build on or reimagine our work in a way that is most empowering for them and their communities.

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