6-3-2016

How Do Open Educational Resources (OERs) Impact Students? A Qualitative Study at New York City College of Technology, CUNY

Cailean Cooney
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HOW DO OPEN EDUCATIONAL RESOURCES (OERS) IMPACT STUDENTS?
A QUALITATIVE STUDY AT NEW YORK CITY COLLEGE OF TECHNOLOGY, CUNY

by

CAILEAN COONEY

A master’s thesis submitted to the Graduate Faculty in Liberal Studies in partial fulfillment of the requirements for the degree of Master of Arts, The City University of New York

2016
2016

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CAILEAN COONEY
How do Open Educational Resources (OERs) Impact Students?
A Qualitative Study at New York City College of Technology, CUNY

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This manuscript has been read and accepted for the Graduate Faculty in Liberal Studies in satisfaction of the thesis requirement for the degree of Master of Arts.
ABSTRACT

How do Open Educational Resources (OERs) Impact Students?
A Qualitative Study at New York City College of Technology, CUNY

by

Cailean Cooney

Advisor Name: Michael Mandiberg

This thesis reports on findings from a study conducted with students using open educational resources as the primary course material in their Health Psychology course. The study took place at New York City College of Technology (City Tech), of the City University of New York (CUNY), a comprehensive college located in Brooklyn. Students were assigned the OER by their course instructor, who developed it as part of a library funded pilot initiative. Two research instruments were employed to collect qualitative data from students: a survey and one-on-one interviews with a smaller student sample. Both survey and interview items asked students how they engaged with the OER as the primary assigned course material. Students shared feedback about the overall organization of the OER, methods used to access the OER and complete coursework, ease of use, benefits and challenges, and differences and similarities to using a traditional print textbook. Findings indicate that the majority of students were able to access the OER with more ease than traditional textbooks given the multiple electronic devices they accessed the OER from. A small proportion of students encountered minor usability issues, but the most frequent challenge was difficulty gaining access to the OER via college wifi. The majority of students reported that the course readings were equal to or better than traditional textbooks, and responded positively to the variety of learning materials and assignments. Most students agreed they would be willing to register for a course offering a similar resource in the future.
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Chapter 1: Introduction

Textbooks, often the requisite mechanism of curriculum delivery, especially in STEM fields, are now estimated to cost students in the realm of $1,300 per year (College Board, 2014), and between $150 to $200 or more per book. In recognition of the financial burdens that textbooks impose, which can impact students’ ability to access the materials they need for academic success, many colleges have sought to redress the problem by introducing open educational resources (OER) adoption programs.

In fall 2014, New York City College of Technology (City Tech) joined the ranks of other universities by forming an OER initiative run out of the College’s Library, where I am a librarian and chair the OER committee administering the program. At City Tech, a comprehensive college of the City University of New York, located in Brooklyn, the stakes are particularly high. We serve a diverse population, largely low income, urban commuter students. Thus, the formation of City Tech’s OER program was instrumental to ensuring City Tech lives up to the CUNY promise of providing “a quality, accessible education to all regardless of background or means (The CUNY Value, 2016).”

The OER pilot at City Tech (also referred to as the OER Fellowship), awarded stipends for faculty to curate open and alternative educational course materials, which consisted of openly licensed resources and library digital subscription content, to supplant traditionally required textbooks beginning in fall 2015. The resulting OERs were housed on the OpenLab, City Tech’s unique WordPress powered open source platform for teaching and learning.

My thesis reports on findings from a study I conducted with students who were assigned an open educational resource as the primary course material in their Health Psychology course. Two research instruments were employed to collect qualitative data from students: a survey and
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one-on-one interviews with a smaller student sample. Both survey and interview items asked students how they engaged with the OER as the primary assigned course material. Students shared feedback about the overall organization of the OER, methods used to access the OER and complete coursework, ease of use, benefits and challenges, and differences and similarities to using a traditional print textbook.

In the next pages, I discuss the goals and significance of the study, review the fundamentals of open educational resources: their meaning, their potential offerings, the OER movement’s origins, and broadly trace its development in higher education. In Chapter 2, I delve into the City Tech landscape by outlining the student population and demographics, the local OER initiative, and describing the Health Psychology course and its OER. An advantage of writing in longer form (thesis length as opposed to article length), is that it gives me the opportunity to report on the details of the home institution whereas other studies often mention them with brevity, if discussed at all. However, I think this contextual data offers an important entry point for readers to consider parallels and points of departure in other studies, and can stimulate more ideas for OER implementations and research projects.

In Chapter 3, I review the existing OER literature. Chapter 4 traces existing research that has informed the methodology and questions at the heart of this study, namely the ethnographic research about CUNY students’ use of technology in their academic careers, conducted by Regalado and Smale. I move on to discuss the study methodology in detail. Chapter 5 traces the study’s findings, with a discussion, conclusions, and future directions.

Goals and Significance of the Study. My primary goal in this study was to learn how using OERs in place of traditional print textbooks have impacted students’ academic experiences. In
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doing so, I hope to broaden existing discourse on OER adoption beyond often emphasized quantitative measures like student retention and performance, in order to surface critical dialogues about educational materials from the learner's perspective. My choice to conduct research with students has been arrived at through careful consideration. I believe student perceptions and experiences with OERs have been underrepresented in the broader scope of existing OER literature. However, I am cautiously optimistic that this can change as the OER discourse shifts from building awareness about what OERs offer to encouraging their large scale adoption. A recurring discussion within the OER movement to this point is the topic of barriers to OER adoption. The literature discusses faculty’s lack of awareness of OERs, lack of knowledge about how to locate OERs, and challenges finding high quality, subject specific OERs (Allen & Seaman, 2014; Farrow, 2014). The subsequent efforts to address these challenges – problems that may be attributable to a combination of factors including fear, resistance, and lack of training - have essentially put faculty and instructors at the nexus of OER discourse, most especially among OER practitioners and advocates. As a result, I believe this has had the consequence of relegating the student - a primary stakeholder of OERs - to the sidelines, and in Freirian discourse, risks considering the student as an object rather than as an involved subject (Freire, 1996).

This study is intended to engage students and foster a more inclusive and equitable platform on which to consider big pedagogical initiatives like the creation/adoption of open educational resources. My desire to bring students into the OER conversation is informed by the educational philosophy of Paulo Freire, the foremost advocate of critical pedagogy.¹ In

¹ Critical pedagogy encourages problem posing to transform students from passive learners to agents of social change and participants in critical dialogue; a process which upends the teacher student dichotomy. McLaren, P.L. & Crawford, J. (2010). Critical Pedagogy. 147-149.
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*Pedagogy of the Oppressed*, Freire assails the status quo brand of education, characterizing it as a ‘banking model,’ wherein the teacher is the depositor of knowledge and the student is the receptacle, or container to be filled (1996). Such pedagogy, materialized by the lectern positioned at the head of the classroom, with rows of desks lined up to face it, parallels the textbook method of content delivery, which by design promulgates a passive learning experience. Inspired by his work, Klincheloe\(^2\) and colleagues have described the ways that Freirean problem posing influenced their educational research methods:

> …the school curriculum should in part be shaped by problems that face teachers and students in their effort to live just and ethical lives. Such a curriculum promotes students as researchers who engage in critical analysis of the forces that shape the world.

(2011, p. 165)

This quote offers something of a maxim for my study and underscores the importance of making space to question and discuss important matters in education. As free and open access to knowledge intersects with emerging pedagogy in the ever-shifting digital world, OER adoption in higher education is a vital domain to engage in the critical pedagogy and praxis advocated by Freire, Klincheloe, and the many educators who draw inspiration from critical pedagogy.

In this spirit, the student feedback collected in this study will greatly inform the Library’s assessment of the OER pilot (a separate but related project), and may provide a basis for decisions on initiative improvements relating to faculty training and support, or modifications to

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\(^2\) Joe Klincheloe was a scholar of critical pedagogy, educational research, and urban studies.
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the scale and scope of the program. If applicable, study findings will be called upon to advocate for future iterations of the OER program, and additional resource support.

Through the course of designing this study I sought to understand what voices have been prominent in shaping the OER discourse. Philanthropies have been at the forefront of the OER movement since its inception, and as a result, much of the OER movement’s narrative is explicitly linked to foundations and their work. I believe the powerful role of philanthropies in the OER movement complicates and risks undermining critical OER praxis. While the many gains accomplished by philanthropies to advance the OER movement (namely the William and Flora Hewlett Foundation, the Open Society Institutes, and the Gates and Shuttleworth Foundations) are unequivocal, we must also contend with philanthropies as large hegemonic institutions, unrivaled by their stature as cultural models of authority (Herzfeld, 2009).

Foundations promote wide scale policy reform and design grant programs dispensed under a corporate infrastructure, often driven by quantifiable outcomes. The capitalistic constructs that foundations impress upon grantees (and which are reflected in program guidelines) are also reinforced by the rhetoric of education policy reform. In a study that analyzed the published work of ten leading figures in education, among them, Arne Duncan and Bill Gates, the researchers reported how rarely these figures’ writings referred to the need for dialogue and debate in education policy and reform (Hutt & Schneider, 2012). Just three times did ‘dialogue,’ ‘discuss,’ and ‘discussion,’ appear in the sample of all published material from the leading education reformers (2012). This may suggest the rhetoric of education policy reform
How do OERs Impact Students? A Qualitative Study at New York City College of Technology is prescriptive, heavily results driven, and consistent with neoliberal values advanced by venture philanthropy.³

In one of the most recent institutional reports released by the Hewlett Foundation in December 2015, its directives illustrate the influence of corporate business strategy. Speaking to Hewlett’s strategic plan for OER funding, the report references a model like the Zero Textbook Cost degree⁴ and the foundation’s plans to “coalesce” funding to implement wide scale programs. A much smaller proportion of funding will be reserved “…for investments in promising opportunities outside the current pathways, including exploratory grants for developing new pathways (William and Flora Hewlett Foundation, 2015).”

This road map offers a great opportunity to bring OERs to many more students, but the report left me questioning to what degree alternate, low overhead, highly individualized and immersive programs are able to succeed in this climate. Will they be too small in scope to fit into grant guidelines? If alternate programs can make it off the ground, will their results have less impact on policy and discourse because they are dwarfed by more visible, high profile projects? Hewlett’s plan to reserve small investments for alternative OER projects beyond the ‘current pathways’ is an indicator of the power that philanthropic influence wields in shaping the growth of OER programs. I wonder whether alternative programs will become inconsequential. In recognition of the power held by philanthropies to affect change in the OER landscape, I believe as OER practitioners, we must engage diligently to evade or push against the concept of “voice-denying rationality” that Couldry describes. He contends: “models for organizing life that place


⁴ The ZTC degree program launched at Tidewater Community College, Virginia, and switched all the course materials to OERs for the college’s business degree.
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no value on voice undermine it by crowding out alternative narratives that would authorize us to value voice (2014).” This is particularly important in the current climate of the OER movement, where awareness is peaking as a result of new government mandates and expanding grant opportunities for OER adoption, like the Achieving the Dream Open Educational Resources (OER) Degree Initiative.

Furthermore, the recent rise and fall of MOOCs (Massive Online Open Courses) should be a parable to the OER community. Once predicted to put higher education out of business (Billington, 2013), MOOCs swiftly came onto the scene with much pomp and circumstance and just as quickly burnt out (Haber, 2014). MOOCs first emerged as open and experimental but soon transitioned to a commercial model with the infusion of venture capital funds that backed prominent MOOC providers including Udacity and Coursera. The MOOC moved into the domain of alternative course provider, and prominent media coverage featured the rhetoric of MOOC founder Sebastian Thrun, who claimed Udacity was close to finding a “magic formula for education.” Various fees and service models were tossed around during this period, including the emergence of commercial partnerships with universities. Relatively quickly, however, the MOOC model failed on account of dismal course completion rates (Weller, 2014).

Weller, author of The Battle for Open: How Openness Won and Why it Doesn’t Feel like Victory, also discusses how universities’ MOOC related monetization and branding strategies conflicted with the quality of the MOOC. Weller argues that MOOCs reverted to “pedagogically conservative” design out of feared revenue losses. MOOCs began to resemble the traditional lecture style model, a possible symptom of larger companies stomping out more engaging,

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5 For instance, the U.S. Department of Labor’s Trade Adjustment Assistance Community College & Career Training program (TAACCT) requires all grantees to release their work as OERs
6 http://achievingthedream.org/resources/initiatives/open-educational-resources-oer-degree-initiative
How do OERs Impact Students? A Qualitative Study at New York City College of Technology disruptive competition (2014). Inevitably with for-profit models there is risk, as in the case of Udacity, that a global provider of open education can quickly pivot to a corporate e-learning model “if it is not founded in principles of openness (Weller, 2014, p. 110).”

Weller also mentions the lack of transparency that accompanied MOOC business models. There appear to be parallels with current for-profit OER providers. When visiting the websites of Boundless, Flat World Knowledge, and Lumen Learning, it is difficult to peel away the marketing material and understand exact offerings, fee models, and sources of revenue. The MOOC phenomenon is an important reminder that in the relative infancy of education and the digital age, the two must converge at student learning - not at fad, or at the behest of the “prescriptive methods of the dominant elites (Freire, 1996, p. 107),” which may include corporations and venture capitalists.

There are several strategies we can employ to push against potential silencing from overpowering narratives. We can encourage equitable discourse and praxis through qualitative dialogue with all OER stakeholders, preserve space for problem posing and criticism, and be flexible and agile throughout the course of OER implementations so that programs can be assessed and redirected based on the specifications of teaching and learning specialists, that is, the students and instructors.
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A brief Introduction to Open Educational Resources

Defining Open Educational Resources. OERs embody the conviction that access to information and education is a fundamental human right; a belief formally expressed in the Universal Declaration of Human Rights (UN General Assembly, 1948). UNESCO defines open educational resources as “teaching, learning or research materials that are in the public domain or released with an intellectual property license that allows for free use, adaptation, and distribution (UNESCO, 2016).” In the context of the OER movement, ‘open’ learning content is distinguishable from ‘free’ learning content because it has an intellectual property license called a Creative Commons license. The Creative Commons organization, a non-profit founded in 2001 by scholars and activists, designed these licenses to give creators more choice beyond the traditional “all rights reserved model.” An alternative to traditional copyright, Creative Commons licenses make it possible for authors to choose how and to what extent their work gets used, shared, and remixed by others (Harvard Law School et al., 2012). The licenses have been designed to grant copyright permissions via standards that use clear and concise language so they are readily understood. They are also easily identifiable by the license icons that accompany them (Lessig, 2012). By virtue of their design, the world can swiftly decode the license provisions and accordingly abide by the authors permissions for knowledge sharing.

What can OERs offer? The cost of textbooks has risen at four times the rate of inflation since 2006 - by 73% (Senack and Donoghue, 2016). Benkler elucidates the reality that “There is no benevolent historical force, however, that will inexorably lead the technological-economic moment to develop towards an open, diverse, liberal equilibrium (2003, p. 1249).” Yet the alternative offered by OERs is gradually shifting the legacy textbook paradigm as many around the world have recognized that OERs offer a practical and compelling solution to the prohibitive
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price of textbooks. The 2016 national Student Public Interest Research Group (PIRG) report found that 50% of students at community colleges paid for textbooks out of financial aid funds (Senack and Donoghue, 2016). This is a startling figure considering the particular financial vulnerabilities of community college students, most certainly in the CUNY system.

A commentary recently published in the Chronicle of Higher Education entitled, “Students shouldn’t have to choose between books and food,” (Cady, 2016) described the author’s recent consultation with a student who was panic stricken over financial woes. The student, who was also caring for a family, feared eviction and relayed that she had not eaten. The author, currently the director of the College and University Food Bank Alliance, says she has encountered many students under similar duress: “Her story is representative of so many students I have met, students making unimaginable choices in pursuit of a diploma, credential, or certificate. Forced to choose between textbooks or food, groceries or graduation, they experience poverty, hunger, and homelessness (Cady, 2016).”

Furthermore, several reports have published revelatory data about the burdens and limitations that textbook costs impose. The 2012 Florida textbook survey produced a seminal report that provides evidence of the grave consequences resulting from unequal access to curricular materials. 35% of students took fewer courses and 31% avoided registering for a class altogether because of the associated textbook costs. Additionally, 63% of enrolled students did not purchase the required textbook because of the expense (Florida Virtual Campus, 2012).

College students have joined the discourse by advocating for the adoption of open textbooks as a cost savings measure. Notably, the U.S. Student Public Interest Research Groups (PIRGs) have published two reports on the subject in the last two years. Their 2014 report found that almost 94% of surveyed students were either somewhat to significantly concerned that not
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having textbooks would impact their grades, and 82% of students indicated they would perform much better in a course if they had free access to the textbook online (Senack, 2014).

These results demonstrate that cost burdens are hitting students on multiple fronts, even impacting the number of courses a student can take at a given time as well as the type of course chosen. These circumstances increase the potential to slow rates of academic persistence. Students whose time to degree is prolonged face significant financial strains. Particularly, federal student aid can be jeopardized if students don’t meet required thresholds for credits or maintain satisfactory academic standing. This is of paramount concern at City Tech where 80% of students received federal student aid, and where a lack of access to the text is a realistic impediment to achieving satisfactory marks (Federal Student Aid, 2016).

Beyond the advantages OERs present for reducing or obviating the price of textbooks, OERs also offer flexibility to adopt new and diverse modes of teaching and learning. EDUCAUSE outlined the potential benefits of open educational resources in a 2010 article: “Giving faculty the ability to pick and choose the individual resources they want to use—and to modify those resources and “assemble” them in unique ways—promises greater diversity of learning environments.” OERs are not, however, synonymous with better pedagogy. If the primary goal is to provide free access, an open textbook (that is primarily text based) simply transfers a traditional learning resource into a digital format but does not transform or enhance pedagogy with technology.

By taking advantage of flexibility, instructors can adapt learning content to better suit individualized curricula and make it possible to integrate multimodal learning materials in a way that textbooks cannot. In addition the pedagogical innovation that OERs can support, students
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have the ability to access OERs through a simple wifi connection. Pitt argues that easy access and customization of OERs is especially important for community college and commuter student populations who often juggle a number of different responsibilities, and come from a variety of backgrounds, and levels of academic experience (2013). A member of the OER fellowship at City Tech shared how OERs can be implemented to the specificity of the curriculum: “I see the use of OER as an excellent resource and solution for creating and implementing courses that cover content from varied disciplines as these types of courses prove to be difficult in terms of identifying one text (Almond, 2016).” Another faculty member in the OER fellowship mentioned the particular strengths of designing an introductory biology lab manual as an OER:

The OER is designed to ameliorate the additional cost of a manual that can undergo rapid revision depending on the changes made to the lab sections depending on the alterations to equipment and/or supplies. In addition, the incorporation of articles that provide insight into required skills in other domains (graphic and scientific writing) can be provided. (Seto, 2016)

In a recent survey (Farrow, 2014) faculty reported positive perceptions about the impact of OERs on teaching and learning. 63% and 67% of faculty respectively, reported using a broader array of teaching methods, and more culturally diverse resources when they taught with OERs. When asked about student learning impacts, a majority of instructors (60% or more) perceived the OER improved grades, helped students develop learner independence and self-reliance, and led to students’ broader interest in subjects.

Origins of the OER Movement. The open educational resources movement is rooted in two activist traditions: the free/open source software movement that emerged in the 1980s, and the open access movement that gained momentum in the early 2000s. The free/open source software
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movement rejected propriety software on the premise that locked software stifled experimentation and innovation, and left the end user vulnerable to the capitalistic interests of companies. The movement insisted that software be free to access and modify (Free Software Foundation, 2015) and established an open licensing protocol called the GNU general public license, a Free Software standard that provided a model for Creative Commons licenses.

The historicity of open licensing also reminds us of the fundamental correlation between rapid proliferation of information technology, computer networking and media, and the successive disruption to traditional economies of knowledge production and consumption.

Yochai Benkler, a scholar of law, and faculty member at the Berkman Center for Internet and Society, wrote about potential shifts to the traditional market paradigm in light of technological proliferation:

Ubiquitous low-cost processors, storage media, and networked connectivity have made it practically feasible for individuals, alone and in cooperation with others, to create and exchange information, knowledge, and culture in patterns of social reciprocity, redistribution, and sharing, rather than proprietary, market-based production. (2006, p. 462)

Benkler’s statement describes the potential to disrupt twentieth century industrial models of growth and innovation in the new networked information economy. Similarly, Lawrence Lessig, a co-founder of the Creative Commons, and colleague of Benkler’s, warned in the Future of Ideas that if access to the wealth of information on the Web were to be restricted, society would suffer a great loss of creativity accompanied by rising inequality at a global scale (2002). These ideals seek to challenge the traditions of the proprietary establishment.
Members of the academy who also championed openness and knowledge democratization formalized their principles at the 2002 Budapest Open Access Initiative with a historically significant declaration that access to the ‘fruits of research’ published in scholarly journals should be unrestricted and available to the world without pay walls (BOAI, 2002). It states:

Removing access barriers to this literature will accelerate research, enrich education, share the learning of the rich with the poor and the poor with the rich, make this literature as useful as it can be, and lay the foundation for uniting humanity in a common intellectual conversation and quest for knowledge. (BOAI, 2002)

The open access movement has been a close partner with the OER community because it shares the same social justice agenda, and has been instrumental in mobilizing academic advocates, in particular librarians, who have become a powerful force to advance open education at the post secondary school level (Allen, 2014). The support of influential organizations such as SPARC (the Scholarly Publishing and Academic Resources Coalition), the Creative Commons, and the Right to Research Coalition, were early champions of open access, and quickly operationalized to support open education advocacy.

**Formation of the OER Movement.** In 2000, as MIT and other universities considered how to capitalize on the dot.com boom, Merill Lynch published a 368-page analysis report on the “e-knowledge industry,” which projected that the U.S. online higher education market would reach 7 billion dollars by 2003. MIT convened a review board to consider the prospects of e-learning

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How do OERs Impact Students? A Qualitative Study at New York City College of Technology and put forth several proposals, shaped in part, by financial analysis. However, the review board became wary that proposals did not adequately align to the University’s mission or constituents. They pivoted to a non-profit model, which was essentially the beginning of the open courseware project. From the support of MIT’s president at the time, Charles Vest, and the blessing of a majority of MIT faculty (Carson, 2009), the MIT OpenCourseWare project officially took off in 2001 with an ambitious goal to post free course materials online from most of its 2000 courses within the next ten years (Goldberg, 2001) and was instrumental in getting the world to take notice of OERs.

Several influential international OER strategy meetings followed MIT’s announcement. From the financial support of the William and Flora Hewlett Foundation and the Western Cooperative for Educational Telecommunications, a group of world leaders in education gathered in 2002 at UNESCO headquarters to participate in the OER Forum where leaders discussed how open courseware could impact higher education on an international scale, and considered pathways toward policy infrastructure, and methods to gain support from institutions and nations at large. The meeting concluded with a declaration “to develop together a universal educational resource available for the whole of humanity, to be referred to henceforth as Open Educational Resources” (UNESCO, 2002).

In 2007, another group of OER leaders met in Cape Town, South Africa, again with philanthropic support from the Shuttleworth Foundation and the Open Society Institutes. The meeting acknowledged the barriers that restrict OERs from becoming more widely used. They mentioned common roadblocks including a general lack of awareness on the part of governments, instructors, and higher education at large, and reticence among some over purported effectiveness and benefits to using OERs. The Cape Town meeting also put forth goals
How do OERs Impact Students? A Qualitative Study at New York City College of Technology to advance OER adoption by increasing engagement with potential OER adopters and creators, advocating for the use of Creative Commons licenses to promote sharing, and pushing to allocate taxpayer funds toward OER projects (The Cape Town Open Education Declaration, 2007). The result, they hoped, would expand OER engagement from thousands to millions of people.

By 2008, the OpenCourseWare (OCW) Consortium, comprised of universities and organizations throughout the world, reached over 200 members. The combined inventory of the consortia’s collective OER websites yielded over 6,200 open courses, with preliminary reports of about 2.25 million global visits per month (Carson, 2009). 4 years later, when the 2012 World Open Education Resources (OER) Congress met, the language of the declaration that emerged shifted to increasingly strategic recommendations for nations. Referred to as the 2012 Paris OER Declaration, it lists ten recommendations for nations to advance open educational resources as a fundamental human right by encouraging adoption of open license frameworks, formation of strategic technological alliances, and advancement of OER related research (2012 Paris OER Declaration, 2012).

Despite this study’s focus on OER adoption in U.S. higher education, it is evident in the preceding paragraphs that the OER movement has, from the very beginning, been significantly shaped on the international stage, and this is still very much the case today. One need only view the list of Open Education Consortium members, and browse the speaker lineup for OpenCon, an early career conference in its second year, on open education, research, and data, to see the international prominence of the OER movement.

Proliferation of OERs. The amount of open educational resources available to the public has grown vastly in the 15 years since the OER movement started. A 2007 report cited 3,000 full

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8 Formerly known as the OpenCourseWare Consortium: [http://www.oeconsortium.org/members/](http://www.oeconsortium.org/members/)
How do OERs Impact Students? A Qualitative Study at New York City College of Technology courses, and hundreds of thousands of learning content materials available (OECD, 2007). As of 2014, there are now 250 plus open textbooks, 2,150 course materials on MIT OpenCourseWare alone, and the Open Education Consortium reports 47,901 open courses (Allen, 2014).

The OER movement has further galvanized as a result of university led initiatives begun in the early 2010s that contributed substantial learning materials to the OER pot. Initiatives spawned collections including MERLOT II, an OER portal produced from a program in the California State University system, OpenStax, a repository of open textbooks affiliated with Rice University, and the Open Textbook Library at the University of Minnesota. These resource discovery tools provide high quality options to share and discover OERs. The above examples are representative of some of the larger university affiliated OER contributions, but many more exist, as do a number of OER adoption programs.

On the local college and university level, grass roots initiatives such as Temple University’s Alternate Textbook project, launched in 2011 “…to encourage faculty experimentation and innovation in finding new, better and less costly ways to deliver learning materials to their students” awarded faculty funds to develop OERs (Temple University, n.d.). A similarly structured initiative at the University of Massachusetts Amherst launched the same year as Temple’s program. The UMASS Amherst initiative “is a faculty incentive program that encourages the use of existing low-cost or free information resources to support our students’ learning (UMass Amherst Libraries, 2016).” There have been seven cycles run with faculty cohorts at UMass and both programs emphasize using library and free resources in addition to openly licensed learning materials and were templates for the design of City Tech’s initiative.

On the state level, efforts to improve student completion throughout the Washington State Community and Technical College system made a strategic plan to adopt and contribute to
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open resources. The initiative’s efforts have resulted in adoption of OERs in 81 courses with high enrollment and prerequisite “gatekeeper” courses. Oregon and Virginia have similar programs as well.

A very popular program at Tidewater Community College has received a lot of positive attention. The College implemented the first of the nation’s Zero Textbook Cost degree programs (ZTC degree). Tidewater’s associate degree in business replaced all of the required textbooks with OERs so students can progress through their academic careers with no textbook costs. Other exciting work is happening within academic disciplines. Mathematics departments have made great strides to integrate OERs into the curriculum with the example of WeBWorK, an open-source online homework system, hosted by the Mathematical Association of America.

For-profit companies also offer OER services including Flat World Knowledge and Lumen Learning. Flat World Knowledge, began offering free access to textbooks online, but moved to a completely monetary model in 2012; begging the question (as in the case with MOOCs), what kind of for profit models can support access to free and openly licensed content? (Watters, 2012). Lumen and Flat World Knowledge offer a combination of services that can bundle learning management platforms with OERs as the curricular materials. Boundless is another for-profit that provides free textbook content with customized quiz and assessment activities. The service requires instructors and students to register for an account to use the content via the Boundless system.

10 http://www.sbctc.edu/colleges-staff/programs-services/elearning-open-education/open-educational-resources.aspx
13 See http://webwork.maa.org/community.html
Chapter 2: The City Tech Context

City Tech’s Student population. This study was conducted at New York City College of Technology (City Tech), a comprehensive college that grants both Associates and Baccalaureate degrees in a variety of academic programs. City Tech distinguishes itself from the 24 CUNY colleges for its offerings in technical, and STEM related fields. The college continues to maintain a commitment to its origins as a technical vocational training institution, founded in 1946 to build a formidable workforce in the emerging postwar economy of the 1950s. This is reflected in the college mission, which aims to prepare “…a technically proficient workforce and well-educated citizens (Hotzler, 2016).” Programs of study at City Tech include standard applied STEM fields such as Nursing, Computer Systems Technology, Applied Mathematics, etc., and more unique disciplines such as Entertainment Technology, Hospitality Management, and Radiologic Technology.

City Tech serves over 17,000 students, 52% of whom are in associate’s programs, and 41% are in bachelor’s degree programs. Over 85% of City Tech students receive financial aid. A majority of students are at full-time status (62%), and the remaining 38% of students are enrolled part-time. The student population is diverse. 32% of students are Hispanic or Latino, 30% are Black or African American, and 20% are Asian. The 2014 Student Experience Survey data indicates that 50% of students at City Tech report a household income of less than $25,000 per year and about 10% earn less than $10,000 per year. Half of City Tech students work while in college, many of whom put in double-digit or full-time hours weekly: 21% of students work 35 hours or more per week, and 27% are working between 21 to 34 hours per week. It is also important to note that of those who do not work, more than half reported it was because they

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14 A biennial student survey conducted throughout CUNY.
How do OERs Impact Students? A Qualitative Study at New York City College of Technology could not find a job. Students’ most commonly cited reason for earning money is to pay for living expenses, and tuition and fees. Based on the amount of hours City Tech students devote to earning a living or fulfilling non-academic responsibilities, it is not surprising that 43% agree work has affected their academic performance (CUNY Office of Institutional Research and Assessment, 2014).

The OER initiative at City Tech. The specific student demographics at CUNY and City Tech demonstrate how open educational resources could introduce much more reliable access to curricular materials for our students. In September 2014, CUNY’s University Dean of Libraries, Curtis Kendrick, testified at the NYC Council on Textbook Affordability. There, he cited the potential for OERs to significantly reduce the cost of textbooks (Kendrick, 2014). Following his testimony, CUNY approved up to 10 percent of library textbook monies\textsuperscript{15} to fund the implementation of OERs on CUNY campuses. With redirected funds, City Tech Library formed an OER Committee in November 2014 and began shaping a pilot initiative to fund faculty generated OER projects. The initiative launched in spring 2015 and was comprised of OER faculty fellows who applied and were accepted to participate in the program. Eligibility requirements stipulated that fellows must be full-time faculty (for remuneration purposes), and that OER needed to be implemented as the only required course material, and the expectation that future sections would adopt the OER as well, which was confirmed by the faculty participants’ department chairs.

Fellowships were awarded in the form of stipends to select and curate course materials (choosing from open educational resources, the instructor’s own curricular content, and library

\textsuperscript{15} When CUNY raised tuition, the university agreed to offset the cost of textbooks by providing funds for colleges to purchase textbooks to put on reserve in the library. http://www1.cuny.edu/mu/forum/2010/01/22/cuny-helps-students-cope-with-high-cost-of-textbooks/
How do OERs Impact Students? A Qualitative Study at New York City College of Technology resources) during the spring term. The potential inclusion of library-licensed materials do not constitute open educational resources, however, instructor content was Creative Commons licensed. In contrast to open textbook programs, other OER programs may also promote the option to integrate alternative materials, effectually placing curricular relevance as the principal inclusion criteria. A similar OER initiative at CUNY, Borough of Manhattan Community College\(^\text{16}\), designed their program similarly with the option to include library licensed content.

The City Tech OER fellowship initiative is distinct from other OER programs across the U.S. in several ways: it is not an open textbook adoption program; rather, it supports the creation of OERs by incorporating multiple open educational materials to produce a collection of primary course materials (more akin to the course modules on MIT OpenCourseware). The fellowship is also distinguished from other OER programs based on our recruiting methods. Faculty participated out of their interest, courses were not chosen based on highest enrollment, or any other predefined criteria.

Finished OERs would be housed on the City Tech OpenLab, an open source, WordPress based platform developed from Title V grant funding awarded to the college in 2010.\(^\text{17}\) The OpenLab’s mission synthesizes extraordinarily well with the goals of the OER initiative. Conceived as an open online teaching and learning system, unlike other closed learning management systems such as Blackboard,\(^\text{18}\) the OpenLab provides a space for the whole City Tech community of students, faculty, and staff to interact together through flexible channels,

\(^{16}\) BMCC is one of CUNY’s community colleges and designed a OER initiative that also encourages the use of Library licensed resources [http://bmcc.libguides.com/opentextbooks](http://bmcc.libguides.com/opentextbooks).

\(^{17}\) The OpenLab is part of City Tech’s U.S. Department of Education Strengthening Hispanic-Serving Institutions (Title V) grant. [https://openlab.citytech.cuny.edu/livinglab/living-lab/](https://openlab.citytech.cuny.edu/livinglab/living-lab/)

\(^{18}\) Blackboard is also used at City Tech, and required for online and hybrid courses to submit and report grades to students, in part because of procedural guidelines, but also because of FERPA regulations.
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both informal and formal (OpenLab at City Tech, 2016). Members of the team leading the
OpenLab wrote about open pedagogy as the defining characteristic of the platform:

There seems too often to be an explicit agreement that instructors lead and students respond,
that instructors advise as students seek guidance, that when instructors talk about their
pedagogy, it should be outside of earshot of the students they instruct. Open digital platforms
can break these implicit rules to make spaces for joint inquiry among all members of the
college community in the spirit of Freirian ideals of critical pedagogy. (Rosen & Smale,
2015)

To support the open pedagogy philosophy, the OpenLab offers several out of the box, mobile
optimized environments for students and faculty to create their own website including portfolios,
projects, and clubs. Faculty have additional permissions to create course sites that can be open to
the public, and are accessible to students after their City Tech careers end. Since the OpenLab is
an open platform, we were able to fulfill another of the OER initiative’s goals to provide public
access to OER content so instructors beyond City Tech can adopt materials generated during the
fellowship.
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Figure 1 – Detail of the Health Psychology landing page

Figure 2 – Detail of the Assignment Outline page
Figure 3 – Detail of the Assignments (by subject) drop down menu
The Health Psychology Course. The study was conducted with students enrolled in three sections of the interdisciplinary Health Psychology course. This course lent itself particularly to an OER since the curriculum tackles contemporary issues from various disciplines, such that no suitable textbook existed. Unofficially termed “Critical Health Psychology” by the course instructor and labeled as such on the OER course site, note that future reference to the course as “Critical Health Psychology” is made in the context of the survey and interview protocols. This terminology was chosen to maintain consistency while interacting with students about the course OER. In order to provide the reader with more context about how students came to be enrolled in this course, I will outline how the course fits into the college’s curricular map.
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Health Psychology is a three credit interdisciplinary course. At the time the study was conducted, each class met face to face for one and a half hours (3 hours total), twice per week during the fall 2015 semester. Students were eligible to enroll in the course if they had already completed two prerequisites: English Composition I, and Introduction to Psychology. Health Psychology is offered under the “Individual and Society” flexible core area. To fulfill the general education requirements of the college, every student is required to take at least one course in the “Individual and Society” track. Flexible core credits are completed in addition to the 4 required core courses in mathematics, the sciences, and English. The overall framework comprises the general education requirements for associate’s and bachelor’s students; normalized across CUNY in 2013 under the Pathways initiative (General Education Common Core at City Tech, 2016).

In addition to Health Psychology’s eligibility under the flexible core general education guidelines, bachelor’s students are required to take at least one interdisciplinary course before they graduate, which could be satisfied by the Health Psychology course. Health Psychology can also satisfy another bachelor’s student requirement for liberal arts credits. This includes completion of a prerequisite, followed by an advanced level course. Students who already completed Introduction to Psychology could enroll in Health Psychology to meet this requirement (City Tech, 2015).

**The Health Psychology OER.** Below is the course description for the Health Psychology course:

The interdisciplinary theme of this course will provide an overview of extant literature on theories of health psychology within the context of critical race theory, epidemiology,
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research methods, philosophy of science, biological anthropology, sociology, as well as applied health/medical fields for an enriched understanding of the biopsychosocial approach to health and illness. Lectures and in-class activities as well as films, guest lecturers, and interactive computer programs make up this textbook-free course with required readings made available via CityTech’s OpenLab and Open Educational Resources (OER) (Almond, 2015).

The Health Psychology OER is essentially a full course module housed on a WordPress powered course site on the City Tech Open Lab. It is not only the primary course material; it is effectively a full course “hub.” The learning materials collected on the site are a combination of existing OER, instructor generated OER, and external sites that are linked out to, including library subscription materials, and free materials that are not Creative Commons licensed. The course site includes all required assignments and readings, the syllabus, due dates, etc. In this way it is distinct from a traditional textbook because it contains all the supporting documentation for the course. Since the curricular content is collected from multiple sources, the overall delivery is also different from a traditional textbook. In the study, the resource was referred to as the “Critical Health Psychology course site,” and discrete learning objects within the course site were commonly referred to as course materials on the Critical Health Psychology course site.
Chapter 3: Literature Review

Upon examination of the literature landscape, there are two tracks that stand out: I term them OER advocacy literature and OER adoption literature. OER advocacy literature has been actively contributed to since the inception of the OER movement. A number of topics are covered by OER advocacy literature, but they are all common in that they discuss the what, why, and how of OERs, and are thematically centered on building awareness and encouraging involvement in the OER movement. The second track of literature, OER adoption literature, has only substantively emerged from 2011 on (Zancanaro, 2015), and covers the results, evaluation, and assessment of OER adoptions.

OER Advocacy literature. From the beginning of the OER movement, prominent foundations and international institutions have been at the forefront of shaping OER discourse. Organizations such as the William and Flora Hewlett Foundation, and UNESCO have sponsored OER advocacy literature on subjects ranging from OER outreach, leadership, community coordination, best practices, and adoption, to policy recommendations for educational institutions and governments. These topics are a logical extension of philanthropies’ positions as principal investors in grant programs that advance their strategic goals. In contrast to journal publications (which often exist behind a pay wall), much of this literature is commonly accessible to the public through their institutional websites, and is an easy channel for new or prospective OER practitioners\textsuperscript{19} to tap into. It is important to note that OER advocacy literature is not exclusively produced by philanthropies. In fact, many OER practitioners affiliated with colleges and organizations including the CCCOER (The Community College Consortium for Open Educational Resources) generate literature particularly focused on best practices for

\textsuperscript{19} For the purposes of this discussion, OER practitioners are individuals or groups coordinating OER initiatives and/or creating, adopting, and teaching with OERs.
How do OERs Impact Students? A Qualitative Study at New York City College of Technology adoption and implementation of OER initiatives. Another example of diverse authorship in the OER advocacy literature is the national Student Public Interest Research Group (PIRG), which has published reports to push for OER adoption at colleges.

Environmental scans and analysis reports sponsored by philanthropies are a typical genre of OER advocacy literature. They track the conditions of OER adoption, and provide strategy recommendations to funders and the greater OER community of OER strategists, advocates, and purveyors of OER programs/initiatives. For example, The Hewlett Foundation commissioned a report by the Boston Consulting Group that discussed tracking core metrics for a consistent picture of how the OER movement progresses or lags, and emphasized quantitative metrics to establish impact on learning outcomes and access to OERs (2013). Another Hewlett affiliated report, “Opening the curriculum: Open Educational Resources in U.S. Higher Education, 2014,” outlines a nationwide survey conducted by the Babson Research Group in 2014. It reports that the biggest barrier to OER adoption are faculty perceptions about the time required and level of difficulty finding and evaluating OERs (Allen & Seaman, 2014). The report asserts that faculty wield the most power in determining the success or failure of the OER movement. Consequently, much attention has been paid to bolstering a faculty stake in the process to improve buy in (Allen and Seaman, 2014). In a third Hewlett sponsored report entitled “A review of the Open Educational Resources (OER) Movement: Achievements, Challenges, and new Opportunities,” Atkins conveys challenges associated with OER pilot projects. These range from sustainability of resources in the absence of external grant funding, management of content curation, and preservation of access, to intellectual property, ensuring content quality, and methods to assess and enhance existing materials (2007).
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These contributions to OER advocacy literature are helpful in that they can provide strategies and context for OER program implementations, but because their subject scope prioritizes OER outreach and implementation, they are absent of any deep examination in the post adoption phase. McAndrew and Farrow describe this as a characteristic symptom of the early stages of the OER movement: “Much early OER activity was driven by ideals and interest in finding new ways to release content, with less direct research and reflection on the process” (McAndrew, 2013).

Although the topics covered above are representative of the dominant themes in OER advocacy literature that predominantly favor faculty stakeholders – students, though much less represented – do get mentioned in OER advocacy texts. For example, UNESCO’s 2011 draft of “Guidelines for OER in Higher Education” recommends significant student involvement in the “Guidelines for Student Bodies” section and encourages “student participation in activities to support OER development (UNESCO, 2011).”

By contrast, in Wiley et al.’s 2013 chapter entitled, “Open Educational Resources: A Review of the Literature,” for the Springer Handbook of Research on Educational Communications and Technology, students do not get discussed at all. Rather, they categorize the literature according to modes of sharing and producing OERs, commons-based peer production, and the benefits and challenges of OERs. Challenges are divided into discovery, sustainability, quality, localization (adaptation), and remixing (2013) and the authors go on to write: “These five difficulties structure the discussion of research challenges that follows (2013, p. 13).”

**Intersections in advocacy and adoption literature.** To suggest that OER advocacy and adoption literature are exclusively striated would be to offer a false dichotomy. OER advocacy
How do OERs Impact Students? A Qualitative Study at New York City College of Technology and adoption literature overlap at a very crucial point: assessment. Assessing OER adoptions can inform OER advocacy literature on best practices and strategies for creation/adoPTION. In this way, it is evident that the two literatures can inform one another. Nonetheless, it is important to consider the literatures for their distinctions, and to put a critical lens on the authors, their motivations, and intended audiences.

An example of the convergence of both literatures is demonstrated by environmental scans that describe the OER landscape. The concern over faculty hesitations - perhaps the most fundamental barrier to OER adoption - has permeated into OER adoption literature; already thoroughly examined in the OER advocacy literature. Studies on OER adoption have asked research questions about faculty motivations, perceived barriers, benefits and incentives encountered when they teach with OER, and how they evaluate OER adoptions (Bliss, et al., 2013; Young, 2015; Chae, 2015). Finding answers to these types of experiential questions is valid and could very well inform a constructive method to generate strategies to resolve faculty hesitate. However, the prevalence of the issue confines the discourse to the instructor and the OER; effectively relegating the student experience to the margins.

**OER Adoption Literature (U.S. Higher Education).** There has been a recent increase in literature about students’ use of OER, but it remains quite diminutive and the local customization of OER programs and campus demographics may limit our ability to draw broad conclusions from individual studies. Thus, the current literature can be characterized as a small but growing collection of case studies of OER adoption programs across the U.S.

There are ten research articles, one program report, and one dissertation that currently account for the lion’s share of literature that to some degree, discusses student impacts from
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OER adoption in the U.S. There are several significant features to note from these studies, including the scope of the initiatives and the type of learning material adopted. Three studies (Bliss, et al., 2012; Bliss, et al., 2013; Robinson, 2015) discuss the implementation of Project Kaleidoscope, also referred to as the Kaleidoscope Open Course Initiative, which began in 2012 with grant funding from Next Generation Learning Challenges, part of the Bill and Melinda Gates Foundation, to develop open textbooks in a number of general education courses that were used at eight different colleges serving predominantly at risk students (Lumen, 2014). Six studies discuss adoption of open textbooks (including the Project Kaleidoscope programs) between 2008 and 2012 (Petrides, et al., 2011; Bliss, et al., 2012; Robinson et al., 2014; Bliss et al., 2013; Robinson, 2015) although Fischer et al.’s study did not mention the dates of use (2015). During that four year period, a couple of large scale open textbook adoptions were being funded: Project Kaleidescope, and the Community College Open Textbook Project (CCCOTP). Four articles report on OER initiatives that utilized open textbooks (including one that was a wiki based text) in combination with supplemental educational materials during the years spanning 2010 to 2012, and 2014 (Feldstein, 2012; Hilton, J. G. & Laman, 2012; Hilton III, J. G. et al., 2013; Allen, G. et al., 2015). Two studies report on OERs that consisted of a collection of curated learning objects adopted in the classroom during 2011 and 2014 (Pitt, 2013; Affordable Learning Georgia, 2015). As this breakdown demonstrates, the majority of literature discusses open textbook adoptions. However, adoptions of various curated OERs, like the City Tech program, are less prevalent.

20 General trends in the literature are covered in this discussion, but the primary focus is on OER adoption in U.S. higher education.
21 Information about Project Kaleidoscope on the Next Generation Learning Challenges website: http://nextgenlearning.org/grantee/cerritos-college-lumen-learning
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Hilton’s recent synthesis of current literature on OER adoptions through 2015 divides the scholarship (as others have described as well), into research on OER efficacy and research on perceptions among faculty and student adopters (2016). Nine studies were identified that utilize quantitative methods to measure efficacy. This indicates that quantitative evaluation of student performance is the most frequent research method used to study student use of OER in the classroom. It is an important area to measure because empirical research is limited and because OER adoption is still in a formative state and requires proof of effectiveness to influence policy. In a 2013 report, the Hewlett Foundation underscored this need: “policy makers, administrators, and educators have yet to be fully convinced that OER are worth integrating into everyday use” (William and Flora Hewlett Foundation, 2013). As such, findings on quantitative efficacy are likely to stay a dominant fixture of the literature in the foreseeable future.

The nine OER efficacy studies used control groups (course sections not using OERs) and treatment groups, and measured various performance indicators such as final exam scores, course pass rates, final GPAs, course withdrawal rates, likelihood of course completion, and number of credits taken per semester (Hilton, 2016). Results from the nine studies vary. However, all findings support the conclusion that students’ performance is the same using OERs; and does not decrease student learning. Fischer’s study reported that students in OER courses had significantly higher enrollment credits in their following semester and suggested it may be due to students saving money in the prior OER course (2015). Similarly, in Robinson’s study of students who participated in Project Kaleidoscope program from 2010-2012 found that students who used open textbook on average took about one quarter more of a credit during the semester they used the open textbook, compared to the students who used traditional textbooks (Robinson, 2015).
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In Hilton’s overall assessment of efficacy studies, he emphasized the challenges of research design, which can include suboptimal sample sizes for control and treatment groups, and uncontrollable variance in design of OER implementations, including instructors, and semesterly enrollments trends. Hilton also criticized a number of the studies and recommends more rigorous techniques to control for potentially confounding covariates by employing instruments such as propensity score matching and randomized treatments (2016). Perhaps the most important conclusion to be drawn is that with quantitative studies, it is difficult to determine causality by measuring comparative data for OER and non-OER course sections. This point was raised in an earlier study by Hilton and Laman and reiterated in this most recent work (2012 & 2016).

The rise in student-centered research in the last 5 years may signal a shifting trend in the literature coverage. Several studies that evaluate OER adoptions employed both quantitative efficacy measurements and qualitative methods to learn faculty or student perceptions, while even fewer studies exclusively focus on student perceptions and experiences with OER adoption.

At the time of writing this, I am aware of seven published studies that conducted student surveys (Bliss, et al., 2012; Feldstein, et al., 2012; Hilton, et al., 2013; Affordable Learning Georgia, 2015; Bliss, et al., 2013; Pitt, 2013; Petrides et al., 2011). Most studied open textbook adoptions that were larger than City Tech’s pilot initiative. Pitt’s study did not share survey protocols in the discussion so it was not possible to compare that study in the company of the others. Some general trends in the survey responses show that OER users were satisfied with the cost savings that OERs afforded (Petrides et al., 2012; Bliss, et al., 2012; Hilton, et al., 2013). Of the surveys that asked students to compare the OER to a traditional textbook, the majority of students preferred the OER (Petrides et al., 2011; Feldstein, et al., 2012). Virginia State
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University’s business program adopted an online Flat World Knowledge textbook and 72% of students preferred it because of its enhanced portability over textbooks. 62% of students agreed the Flat World Knowledge textbook helped them to engage more with their course than a traditional textbook did. The researchers acknowledged that students’ may have had biased preference toward the OER since it was free (Feldstein, et al., 2012). Students at Scottsdale Community College who used an open textbook and supplemental workbook materials responded favorably to the quality of their assigned materials as well. 83% agreed that the open textbook adequately supported their class work and 76% of students indicated they would recommend the OERs to classmates (Hilton, 2013). 85% of students surveyed about using curated OERs from Georgia’s Textbook Transformation grants also had positive ratings (Affordable Learning Georgia, 2015). By a firm majority, students in all studies found the OER to be as good or improved from textbooks.

To date, I am aware of only two other studies that interviewed or conducted focus groups with students. Among them, Petrides et al. studied the impacts of the Community College Open Textbook Project (CCOTP) in 2008, a program conducted with community colleges throughout the U.S. Their findings support that students most commonly noted cost savings as a benefit, as well as easier access to the materials. 30% of students felt portability was a deciding factor in using the open textbook for their course (2011). The other study by Pitt, et al. (2013) conducted did not reveal much of the data from the interview protocol.

The studies had very few negative student responses. One student at Scottsdale Community College suggested that the curated OER was fine but “should be better (Hilton, 2013).” Of the two isolated groups that received negative feedback in the textbook
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transformation grants in Georgia, they both cited problems with usability, organization, and the writing style of the resources included in the OER (Affordable Learning Georgia, 2015).

Chapter 4: Research Questions and Methodology

Research Questions. Several additional guiding questions helped me shape the survey and interview protocols. I was particularly interested in how students found the usability of the site. Faculty did not undergo any formal user experience or instructional design training for online environments, so the organization of the site was an important variable to track for student feedback. I also had some concern if this new technological infrastructure would be navigable to some students who have less technological experience as some CUNY students fall into the digital divide. I also wanted to learn how, and to what extent students were able to access the OER. Moving to online access for primary course materials is a substantial change. Since a number of students at CUNY are low income, this raised the question of to what extent students can adapt to this shift given the need for resources including wifi and electronic devices. Also, to what extent would the infrastructure at City Tech be able to adequately absorb this shift? My concerns were informed by Regalado and Smale’s 2009-2011 qualitative study about students’ relation to technology in the academic context.

Research context. As previously mentioned, this research project took place within the context of City Tech’s open educational resources initiative, which funded instructors to curate OERs that replaced textbooks. In this study, I was interested in learning details about where and how students use the OER to complete coursework, their perspectives on using the OER instead of a textbook, their feedback on the usability of the OER, and their perspectives on the value and efficacy of the resource. Although Pitt (2013) recommends using mixed methods to reflect more
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holistic results, I chose to focus on collecting students’ perspectives because they have been less represented in other OER studies. There were practical reasons to embrace this method as well. Qualitative student survey and interview data would also be best suited to collect data that could be incorporated as student input to help evaluate the City Tech OER fellowship. The student voice was especially important to capture because, by design, the OER fellowship already facilitated open dialogue between faculty and the Committee organizing the program. Faculty also had a venue to share feedback in a narrative assessment shared with the OER Committee at the end of their first semester adoption period. It also seemed logical not to disrupt the student performance assessment that normally takes place with the course’s home academic department and since the study design intentionally did not incorporate control groups or comparative data from previous course sections.

OERs were developed for several courses during the OER pilot program: an introductory Biology Laboratory course, a Construction Management II course, and a Health Psychology course. I considered whether to study all course adoptions or to focus on one. It became obvious through examining the completed OERs that they each differed in their design and function, resulting in finished products that were quite distinct, and individualized to the respective course. It would have been too challenging to create an effective research design that did justice to such distinctive resources so I proceeded by focusing on the adoption of one OER and the goal of learning in as rich detail as possible, the students’ experiences with it.

I established working relationships with faculty participants in the OER fellowship because of my role as chair of the OER Committee responsible for coordinating the pilot initiative during spring 2015. I approached the instructors about my proposed research project through an email and asked their permission to conduct a study about classroom adoption of their
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OER during the fall 2015 semester. In my message, I shared intended goals and possible outcomes of the research. First, I relayed my hope that the study would integrate student voice into the dialogue about the groundbreaking pedagogical initiative that OER adoption represents. I also aimed to learn how students’ use of OER impacted their course experience, especially in comparison to a traditional textbook. Lastly, I noted that the findings would be a catalyst to assess the OER pilot and potentially aid programmatic change and improvement for future fellowship cycles. I outlined a basic description of the research methodology which would employ two qualitative methods: a survey and a semi-structured interview with students, to be designed and implemented by me.

I received an enthusiastic response from one of the professors in the OER fellowship, the creator of the Healthy Psychology OER. Upon learning that the instructor was piloting the OER with three course sections, an opportunity that could afford me a sizeable increase in the study sample, I moved ahead with securing a firm confirmation from the instructor that it would be possible for me to conduct a study with students in her three course sections.

Methods employed. To answer the types of questions I was interested in, I chose an ethnographic form of inquiry. I conducted one-on-one interviews with students to gather information on their observations, experiences, opinions, and critiques of the OER. The interview format made it possible to pose open-ended questions to counterbalance the ones that more explicitly asked students to compare the use of the OER instead of a traditional textbook. The 12 questions that constitute the interview protocol were mindful of striking a balance described by Wolcott: “The opportunity of ethnography lies in a commitment and devotion to description that acknowledges—but endeavors not to surrender entirely to—comparison (2008).” Wolcott goes on to explain that “The comparative approach is more explicit about it [observable
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differences]; so explicit, in fact, that comparison too easily may become an end in itself that
draws attention away from what is going on (2008).” Thus, the student interviews endeavor to
provide holistic and student centered data to support the study.

The second research instrument employed in this study is a survey protocol. The much
larger sample of student survey responses complemented the smaller sample size of student
interviews. Survey results also contribute to a lithe, but expanding collection of longitudinal data
about OER adoption in U.S. higher education. I consulted several preceding studies (Feldstein et
al., 2012; Hilton, et al., 2013, Bliss et al., 2013, Textbook Transformation Grants; 2015) that
have asked similar questions of students in respective surveys.

Participant eligibility was limited to students enrolled in the Health Psychology course
whose section had been assigned the OER that was created during the Spring OER pilot
fellowship program. The students in the study sample shared the identical OER and the same
instructor. The eligible study sample totaled 86 students.

Both the interview and survey instruments were created to be in dialogue with the distinct
functionalities, design attributes, and resources included in the Health Psychology OER. Several
survey items asked explicitly about these distinct characteristics. For instance, one Likert scale
question asked students their level of agreement about whether specific learning materials
available on the Health Psychology OER (PowerPoint lecture notes, video guest lectures, etc.)
made an impact on their learning experience.

In order to achieve the best survey response rate, I requested to conduct the 5 minute
survey in class, a process that require between 10-15 minutes of class time to account for review
of consent forms and procedures. In compliance with the college IRB officer’s guidelines,
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permission to conduct the survey during class time required written approval from the classroom instructor, the department chair, and the college provost. I obtained all written permissions and the full research proposal was subsequently approved under University IRB guidelines.

Survey design. The aim of the survey protocol was to capture as much student feedback as possible. I consulted the OER Research Hub’s22 shared list of survey questions and looked into online learning literature to cover usability and instructional design more thoroughly (Young, 2013; Lee, 2014) for additional guidance on survey items. First, I provided students with a brief description of the research project and the purpose of the survey before distributing it; also carefully reminding students that the survey was entirely voluntary, and anonymous. It consisted of 12 questions that addressed demographics (number of semesters completed and major), and whether students had prior experience with the OpenLab. Another item asked about routine methods of accessing traditional textbooks. Remaining questions addressed the OER in relation to accessing the resource, completion of coursework, usability: navigation and ability to locate materials, quality, and overall evaluation of the OER, especially compared to a traditional textbook. Likert scale captured student responses with frequencies, levels of agreement, likelihoods, and levels of difficulty. There were also multiple-choice questions, some of which included an option for open ended responses. Since the surveys were completed in print, it was possible for survey respondents to independently contribute comments in the margins as well, though there was no mention or encouragement of this while administering the survey. Surveys were distributed and collected during the last weeks of the term, thus, respondents had

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22 A web resource maintained in the U.K. that has gathered resources and a community to improve the current research landscape by tracking the impact of OER on teaching and learning practices, and providing a public repository for research and data findings (McAndrew, 2013) http://oerhub.net/collaborative-research/instruments/
How do OERs Impact Students? A Qualitative Study at New York City College of Technology experience using the OER for almost a full semester (September through the second week of December).

**Interview design.** The protocol was designed as a semi-structured one-on-one interview. Participants were given standard instructions to follow (both verbally and in print) to maintain the consistency of each interview (Creswell, 2009) and each of the 12 survey questions were read to students via script. It was also stated that both the participant and the interviewer could ask questions to clarify and follow up as needed. Participants were given the option to use 8 1/2" x 11" blank white paper to draw during the interview process but the participants did not use this. To support the observational record and aid analysis, the interviews were recorded and transcribed.

The interview questions consisted of open-ended questions that asked where, with what devices, and how students used the OER to complete coursework. I also asked students how their experiences using the OER compared to using a traditional textbook and asked for feedback on the usability of the OER, and their perspectives on the impact and value of the resource as a primary course material. The first question began as a more general icebreaker. The last question was open ended so participants had the option to voice anything they were interested in adding. I announced the initial recruitment for one-on-one interviews while conducting the in class surveys. Students were notified that there was limited availability to participate in interviews. If interested, students were advised to fill out a sign-up sheet that circulated the classroom that included their name and email address. I followed up with an email message to each student listed on the sign-up sheet to select a date and time to conduct the interview. Students were also made aware during the interview recruitment process that interview participants would receive a $15 MetroCard in recognition of the time they devoted to the interview. I anticipated the
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interviews to last about an hour per person. The most prompt email responses, in accordance
with student distribution of two per section, received the six available interview slots.

**Research Design Challenges.** Nomenclature was a challenging aspect of creating the research
protocols and implementing the study. Since the primary goal of the study was to learn student
perspectives, any teaching and outreach component about OER did not fit the scope, so for
example, students were not expected to be able to define or be familiar with open educational
resources or its acronym; “OER.” As the both the survey and interview protocols demonstrate,
(Appendix “A” and “B”) these terms are omitted. Instead, I attempted to describe the OER in
plain, discernable language, to the best of my judgment. For this study, it is appropriate to refer
to the Health Psychology resource as an OER, but it was consistently referenced to students as
the Critical Health Psychology course site.

**Chapter 5: Findings**

**Surveys.**

Of the three Health Psychology course sections surveyed, the response rates were very
high. This was certainly due to the fact that the surveys were conducted in person and during
class time. Total student responses reached 67. Surveys were answered thoroughly although
some questions were skipped. For reference, response rates for each survey question are
documented at the top of each table. The survey began with two main demographic questions.
Students reported the number of semesters they have completed and their majors.

**Participant demographic findings.** Student participants represented a wide distribution of
majors. Fifteen distinct majors were reported among the 67 students who completed the survey.
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Computer Systems Technology - a baccalaureate program - was the most frequently reported major with 24 (36%) students. The next most reported major was Hospitality Management and Nursing; each major had 8 (12%) students. The third most frequently reported major was Human Services, with 5 (7%) students. The remaining 22 were divided between eleven different majors, with one to three students per major.

Table 1
Distribution of student majors (n=67)

<table>
<thead>
<tr>
<th>Major/Program</th>
<th>Degrees Offered</th>
<th>Percent of Students</th>
<th>Student Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Mathematics (Finance)</td>
<td>BS</td>
<td>1%</td>
<td>1</td>
</tr>
<tr>
<td>Architectural Technology</td>
<td>AAS &amp; B Tech</td>
<td>1%</td>
<td>1</td>
</tr>
<tr>
<td>Biomedical Informatics</td>
<td>BS</td>
<td>1%</td>
<td>1</td>
</tr>
<tr>
<td>Construction Management &amp; Civil</td>
<td>AAS</td>
<td>3%</td>
<td>2</td>
</tr>
<tr>
<td>Engineering Technology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer Information Systems</td>
<td>AAS</td>
<td>3%</td>
<td>2</td>
</tr>
<tr>
<td>Computer Science</td>
<td>AS</td>
<td>3%</td>
<td>2</td>
</tr>
<tr>
<td>Computer Systems Technology</td>
<td>B Tech</td>
<td>36%</td>
<td>24</td>
</tr>
<tr>
<td>Electrical Engineering Technology</td>
<td>AAS</td>
<td>4%</td>
<td>3</td>
</tr>
<tr>
<td>Entertainment Technology</td>
<td>B Tech</td>
<td>3%</td>
<td>2</td>
</tr>
<tr>
<td>Health Services Administration</td>
<td>BS</td>
<td>3%</td>
<td>2</td>
</tr>
<tr>
<td>Hospitality Management</td>
<td>AAS &amp; B Tech</td>
<td>12%</td>
<td>8</td>
</tr>
<tr>
<td>Human Services</td>
<td>AAS &amp; BS</td>
<td>7%</td>
<td>5</td>
</tr>
<tr>
<td>Liberal Arts</td>
<td>AA &amp; AS</td>
<td>4%</td>
<td>3</td>
</tr>
<tr>
<td>Nursing</td>
<td>AAS &amp; BS</td>
<td>12%</td>
<td>8</td>
</tr>
<tr>
<td>Radiologic Technology</td>
<td>AAS &amp; BSRS</td>
<td>4%</td>
<td>3</td>
</tr>
</tbody>
</table>

Also of note are the number of semesters completed by students in the study. 80% of students reported having taken between 3 to 8 semesters. The remaining 20% of students completed between 9 and 14 semesters (see Table 2). Demographic information indicates a student sample that is diverse in terms of their level of academic experience and their type of academic track. While there is no definitive way to report the ratio of bachelors and associates degree students in the study sample, by consulting the breakdown of majors reported to corresponding degrees...
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offered, this broadly indicates that the student sample is representative of both bachelor’s and associate’s students. It is also worth noting that since many students transfer between colleges in the CUNY system, it’s possible that the survey question was interpreted differently by students. Some could have accounted for their total semesters of college, while others may have accounted for semesters at City Tech only. Students were also asked whether they used the OpenLab prior to taking this course. 38 (57%) students reported having used the OpenLab prior to taking the Health Psychology course, and 29 (43%) students had not.

<table>
<thead>
<tr>
<th>Semesters</th>
<th>Percent of Students</th>
<th>Student Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>10.6%</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>16.7%</td>
<td>11</td>
</tr>
<tr>
<td>5</td>
<td>7.6%</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>13.6%</td>
<td>9</td>
</tr>
<tr>
<td>7</td>
<td>12.1%</td>
<td>8</td>
</tr>
<tr>
<td>8</td>
<td>19.7%</td>
<td>13</td>
</tr>
<tr>
<td>9</td>
<td>6.1%</td>
<td>4</td>
</tr>
<tr>
<td>10</td>
<td>7.6%</td>
<td>5</td>
</tr>
<tr>
<td>11</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>12</td>
<td>3.0%</td>
<td>2</td>
</tr>
<tr>
<td>13</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>14</td>
<td>3.0%</td>
<td>2</td>
</tr>
</tbody>
</table>
Accessing Textbooks. Students answered a question about the methods they normally used to access textbooks in other courses. This question was meant to help contextualize their prior patterns of usage, and provide some indication of roughly how many students purchased textbooks in the past. Students selected the level of frequency they purchased or rented the textbook, used a library copy, or borrowed someone else’s book. Students also had the option to select “other” and explain their alternate method for accessing required texts. Students most commonly reported purchasing or renting a textbook (45%). The second most common method was to find a digital version of the book for free online, usually in the form of a PDF (38%). Students rarely/never borrowed the textbook from someone else (61%), and a little less than half (48%) of students rarely/never used a library copy, though 30% of students used a library copy on occasion.

Table 3

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>All or most of the time</th>
<th>Regularly</th>
<th>Occasionally</th>
<th>Rarely/Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>I purchase or rent the book.</td>
<td>45%</td>
<td>14%</td>
<td>18%</td>
<td>23%</td>
</tr>
<tr>
<td>I use a library copy.</td>
<td>9%</td>
<td>13%</td>
<td>30%</td>
<td>48%</td>
</tr>
<tr>
<td>I borrow someone else's book.</td>
<td>11%</td>
<td>11%</td>
<td>18%</td>
<td>61%</td>
</tr>
<tr>
<td>Other.</td>
<td>38%</td>
<td>11%</td>
<td>22%</td>
<td>32%</td>
</tr>
</tbody>
</table>
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Table 4

<table>
<thead>
<tr>
<th>Method of Access</th>
<th>Student Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Download a PDF version online</td>
<td>14</td>
</tr>
<tr>
<td>Find it online / via the internet</td>
<td>7</td>
</tr>
<tr>
<td>Make do without the book</td>
<td>1</td>
</tr>
<tr>
<td>Scan the book</td>
<td>1</td>
</tr>
<tr>
<td>Torrent</td>
<td>1</td>
</tr>
</tbody>
</table>

The distribution of responses indicates that most students use multiple methods to access a required textbook. Between 18% and 30% of students reported occasional use of all four different methods: purchasing/renting the book, using a library copy, borrowing someone else’s book, or a fourth method that they described themselves. 11% to 14% of students regularly used all four methods to access the book.

Table 5

<table>
<thead>
<tr>
<th>Answer Options (select all that apply)</th>
<th>All or most of the time</th>
<th>Regularly</th>
<th>Occasionally</th>
<th>Rarely/Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>I print them out.</td>
<td>16%</td>
<td>11%</td>
<td>24%</td>
<td>49%</td>
</tr>
<tr>
<td>I read them on a smart phone.</td>
<td>31%</td>
<td>13%</td>
<td>30%</td>
<td>26%</td>
</tr>
<tr>
<td>I read them on a personal laptop or computer.</td>
<td>70%</td>
<td>23%</td>
<td>2%</td>
<td>5%</td>
</tr>
<tr>
<td>I read them on a City Tech computer.</td>
<td>25%</td>
<td>31%</td>
<td>16%</td>
<td>27%</td>
</tr>
<tr>
<td>I read them on a tablet.</td>
<td>18%</td>
<td>22%</td>
<td>20%</td>
<td>40%</td>
</tr>
</tbody>
</table>

Accessing the OER. When asked what methods students used to access their assigned readings from the OER, 70% of students reported reading on their personal laptop or computer all or most of the time. This is an interesting finding given the transient nature of urban commuter students,
How do OERs Impact Students? A Qualitative Study at New York City College of Technology and the ubiquity of mobile phone use. Still, reading on a smart phone was the next most common method which 31% of students reported using all or most of the time. Students least frequently read by printing their readings out. 49% of students reported printing out readings rarely or never, while only 16% reported printing all or most of the time. The second least common method of accessing the readings was via tablets. 40% of students said they used tablets rarely to never. This finding may correlate to the recent ECAR study\textsuperscript{23} of undergraduate students and information technology which indicated that only 1% of students exclusive own tablets (and no other electronic device), and only 3% of students owned a tablet and smartphone. While the majority of students owned a laptop, smartphone, and tablet, the next most frequent ownership were laptops and smartphones (ECAR Survey, 2015). The drop in tablet usage also contrasts with Regalado and Smale’s earlier reports that saw a rise in tablet usage in 2011 (2014).

25% of students read with a City Tech computer all or most of the time and 31% read with a City Tech computer regularly. The full distribution of responses also indicates that students use a combination of methods to access the course readings, and despite the prevalence of handheld and portable devices such as smart phones, most students commonly used laptops or desktops to do their reading. During interviews, students also shared how they accessed the OER on a daily basis.

Um, I—depends on the day, and like what I’m doing. I live far out in Brooklyn so uh, my train goes outside, so sometimes I’ll use it on my phone while I’m on the train. Um, I have a Kindle so I can access it from my Kindle, or if I’m home I just use my laptop.

-Student

\textsuperscript{23} ECAR (Educause Center for Analysis and Research) conducts an annual survey on students and information technology use in higher education. https://library.educause.edu/resources/2015/8/2015-student-and-faculty-technology-research-studies
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Students shared why they printed if they had done so. Respondents had the option to select from any or all of the four choices listed to describe why they printed (see Table 6). Of those who responded, the majority reported printing so they could take notes on the page (65%), while the second most common answer was that they simply preferred paper (41%). The response rate for this question was 46. In the prior question there were 66 respondents (Table 5). Based on this deviation in number of respondents, one could infer that about 30% of students found the question not applicable to them, which suggests roughly the same percentage of students did not print at all.

<table>
<thead>
<tr>
<th>Table 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distribution of student responses to the question: “If you printed out any readings for the course, why did you print?” (n=46)</td>
</tr>
<tr>
<td>Answer Options (select all that apply)</td>
</tr>
<tr>
<td>--------------------------------------</td>
</tr>
<tr>
<td>I printed because I prefer paper.</td>
</tr>
<tr>
<td>I printed because it is hard to access the readings online when I'm off campus.</td>
</tr>
<tr>
<td>I printed because it is hard to access the readings online while I'm at City Tech.</td>
</tr>
<tr>
<td>I printed because I wanted to take notes on the page.</td>
</tr>
<tr>
<td>Other.</td>
</tr>
</tbody>
</table>

**Difficulties encountered accessing the OER.** Students most frequently cited difficulties finding wifi to access the OER on campus (27%). 7 (10%) students had difficulty getting access to wifi off campus. Though a small percentage of the total sample, this presents a notable barrier especially given the wifi on campus is unreliable. 3 (4%) students 2 (3%) had trouble finding a device to access the OER on campus and off campus, respectively. These fewer number of students are at a disadvantage that we must be mindful of during program design and planned improvements to college infrastructure. Students in Regalado and Smale’s study share of their
How do OERs Impact Students? A Qualitative Study at New York City College of Technology

frustration when encountering long lines for computers (2014). This is a concern that continues
at City Tech as student enrollment grows.

**User experience.** The survey also asked students what it was like to locate materials from the
OER. 88% of students responded positively by reporting that it was easy (52.2% ) or extremely
easy (35.8%) to find what they needed. 7 (10.4%) students had a neutral response and one
student found navigating the OER to be difficult. Students also chose from a variety of options to
report whether they encountered any difficulties associated with accessing the OER materials.
Due to the design of the question, the responses didn’t indicate whether the challenges reported
were persistent or isolated. Thus, the data cannot reveal whether students overcame the
challenges reported.

**Table 7**

| Table 7 Distribution of student responses to the question: “How would you rate your overall ability to find what you need on the Critical Health Psychology course site?” (n=67) |
|---|---|---|
| **Answer Options** | **Percent of Students** | **Student Response** |
| Extremely easy | 35.8% | 24 |
| Easy | 52.2% | 35 |
| Neither easy nor difficult | 10.4% | 7 |
| Difficult | 1.5% | 1 |
Table 8

Reported challenges associated with accessing materials from the OER (n=63)

<table>
<thead>
<tr>
<th>Answer Options for Table 8</th>
<th>Student Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technological problems with downloading resources</td>
<td>12</td>
</tr>
<tr>
<td>Knowing where to find the resources</td>
<td>15</td>
</tr>
<tr>
<td>Taking notes on the resources</td>
<td>5</td>
</tr>
<tr>
<td>Printing the resources</td>
<td>4</td>
</tr>
<tr>
<td>Finding wifi to access the course site on campus</td>
<td>18</td>
</tr>
<tr>
<td>Finding wifi to access the course site off campus</td>
<td>7</td>
</tr>
<tr>
<td>Finding a device to access the course site on campus</td>
<td>3</td>
</tr>
<tr>
<td>Finding a device to access the course site off campus</td>
<td>2</td>
</tr>
<tr>
<td>No challenges</td>
<td>26</td>
</tr>
</tbody>
</table>

**Educational impact.** Another important aspect of the study was the opportunity to learn more about how different learning materials impacted students. Based on the different materials
How do OERs Impact Students? A Qualitative Study at New York City College of Technology offered on the Health Psychology OER, students were asked to rate how each of them supported their learning process, if at all. The responses were very positive, with the majority of students agreeing that each material supported their learning, suggesting that students liked being able to use a variety of educational materials. Students found the required assignments and required quizzes to be most supportive of their learning process.

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neither agree or disagree</th>
<th>Strongly disagree</th>
<th>Available, but I don’t use this</th>
<th>Student Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Posting or reading comments on the course site supports my learning process.</td>
<td>21%</td>
<td>68%</td>
<td>8%</td>
<td>3%</td>
<td>0%</td>
<td>66</td>
</tr>
<tr>
<td>Powerpoint lectures support my learning process.</td>
<td>29%</td>
<td>61%</td>
<td>11%</td>
<td>0%</td>
<td>0%</td>
<td>66</td>
</tr>
<tr>
<td>Online video lectures support my learning process.</td>
<td>33%</td>
<td>52%</td>
<td>9%</td>
<td>3%</td>
<td>3%</td>
<td>66</td>
</tr>
<tr>
<td>Scholarly articles support my learning process.</td>
<td>27%</td>
<td>50%</td>
<td>14%</td>
<td>6%</td>
<td>3%</td>
<td>66</td>
</tr>
<tr>
<td>Links to other web resources support my learning process.</td>
<td>26%</td>
<td>59%</td>
<td>12%</td>
<td>2%</td>
<td>2%</td>
<td>66</td>
</tr>
<tr>
<td>Required assignments support my learning process.</td>
<td>38%</td>
<td>54%</td>
<td>8%</td>
<td>0%</td>
<td>0%</td>
<td>65</td>
</tr>
<tr>
<td>Required quizzes support my learning process.</td>
<td>38%</td>
<td>54%</td>
<td>6%</td>
<td>2%</td>
<td>0%</td>
<td>65</td>
</tr>
</tbody>
</table>

Students also compared aspects of their course experience against a traditional textbook. Again, the results were largely positive although 32% of students did not think using the OER
How do OERs Impact Students? A Qualitative Study at New York City College of Technology instead of a textbook affected their grade and 35% found it had no effect on their confidence. 20% of students also reported that the OER did not impact their class participation or their interest in the course. Students were most positive about the OER increasing their satisfaction with the learning experience, and their engagement with the course lessons in contrast to a traditional textbook.

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neither agree or disagree</th>
<th>Strongly disagree</th>
<th>Student Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using the course site instead of a traditional textbook:</td>
<td>38%</td>
<td>42%</td>
<td>20%</td>
<td>0%</td>
<td>65</td>
</tr>
<tr>
<td>...increased my participation in class.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>...increased my interest in the course subject.</td>
<td>29%</td>
<td>52%</td>
<td>20%</td>
<td>0%</td>
<td>66</td>
</tr>
<tr>
<td>...increased my exposure to different ways of learning.</td>
<td>41%</td>
<td>47%</td>
<td>12%</td>
<td>0%</td>
<td>66</td>
</tr>
<tr>
<td>...increased my satisfaction with the learning experience.</td>
<td>42%</td>
<td>47%</td>
<td>11%</td>
<td>0%</td>
<td>66</td>
</tr>
<tr>
<td>...increased my engagement with the course lessons.</td>
<td>41%</td>
<td>42%</td>
<td>15%</td>
<td>2%</td>
<td>66</td>
</tr>
<tr>
<td>...improved my grade.</td>
<td>38%</td>
<td>30%</td>
<td>32%</td>
<td>0%</td>
<td>66</td>
</tr>
<tr>
<td>...built my confidence.</td>
<td>27%</td>
<td>36%</td>
<td>35%</td>
<td>2%</td>
<td>66</td>
</tr>
</tbody>
</table>

**Quality and value.** Students shared their overall satisfaction with the OER. 81% of students found the quality of the OER course readings to be somewhat to much better than a textbook and
How do OERs Impact Students? A Qualitative Study at New York City College of Technology

89% of students were likely to register for a course with a similar resource again, with 6 students neutral, and 1 student unlikely to do so in the future.

<table>
<thead>
<tr>
<th>Table 11</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Response rating on the quality of the OER course readings compared to a textbook (n=67)</strong></td>
</tr>
<tr>
<td><strong>Answer Options</strong></td>
</tr>
<tr>
<td>Much better</td>
</tr>
<tr>
<td>Somewhat better</td>
</tr>
<tr>
<td>About the same</td>
</tr>
<tr>
<td>Somewhat worse</td>
</tr>
<tr>
<td>Much worse</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 12</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Response for likelihood students would register for a class using a resource similar to the Health Psychology OER instead of a traditional textbook (n=66)</strong></td>
</tr>
<tr>
<td><strong>Answer Options</strong></td>
</tr>
<tr>
<td>Extremely likely</td>
</tr>
<tr>
<td>Likely</td>
</tr>
<tr>
<td>Neutral</td>
</tr>
<tr>
<td>Unlikely</td>
</tr>
<tr>
<td>Extremely unlikely</td>
</tr>
</tbody>
</table>

**Discussion**

During interviews, students’ most immediately noted their satisfaction with cost savings, and the additional convenience that OERs offered. When students talked about convenience, they often did so by voluntarily contrasting the OER to a traditional textbook. One student mentioned how the OER saved her from developing back pain – something that had happened with textbooks in the past. Other students shared their relief at not having to worry about transporting a textbook to and from class, to work, and elsewhere, which alleviated complications as they planned their academic and life schedules. Both trends of cost savings and convenience are
How do OERs Impact Students? A Qualitative Study at New York City College of Technology consistent with other studies’ findings, though convenience has particular gravity for CUNY students who commute an average of 45 and 60 minutes each way via mass transit (Regalado & Smale, 2014). For additional context, City Tech students are well dispersed throughout the 5 boroughs. 48% of students are based in Brooklyn, 29% are from Queens, 12% are from the Bronx, 9% are from Manhattan, and 2% are from Staten Island (NYCCT AIR, 2016).

Access. The student interviews affirmed the survey results discussed earlier, indicating that a variety of devices were used to complete course requirements.

So um, sometimes I do it [work] on my phone. For the majority I do it in my house, on my laptop. But I also do it here in the school cuz I have a long break between my first class and my Psych class…

- Student

Tablets were less frequently used. One student would not use a tablet because she did not like the experience, whereas another student mentioned using her iPad most of the time, and a third student took advantage of her tablet in public wifi areas. Two thirds of the students interviewed talked of using a combination of a laptop or desktop, and their phone. Half of the students also preferred using a computer (laptop or desktop) to do readings or write papers.

Working environments. In Regalado and Smale’s qualitative study at CUNY, students often mentioned preferences for environmental features like good lighting, and quiet, individual work areas.

For students at commuter schools such as CUNY, the importance of successfully locating places on campus for both social and scholarly work was heightened by their sometimes
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long commutes, which restricted student flexibility for where to accomplish their schoolwork. (2015, p. 910)

While most of the students interviewed in this study mentioned using a mobile phone to complete readings and quizzes online (out of convenience or to maximize their time), students’ also revealed that their environment was an important part of the academic experience. As with the findings from Regalado and Smale’s earlier study, a crucial part of students’ academic work hinged on access to computers at home or on campus. One student completed most of her work at the Library, citing it was a better environment as opposed to home, while another student preferred her home environment to complete the readings. All of the students interviewed - with one exception - mentioned routine use of school computer labs to work on assignments. The student who did not mention using the computer labs preferred working off campus, and found it easier to work outside of home, so Starbucks was her typical site for academic work.

**Usability.** Students found agency by having all of the course materials for the semester available in one online location. They frequently referenced the site as well organized, self-explanatory, and easy to navigate. Most students referred to the due dates as a “go to” that linked to all the supporting materials needed to complete their assignments. This functionality was a welcome departure from their descriptions of scheduling time to visit the library to make copies of assignments. Two students really appreciated having a full, up to date guide covering the semester long course in contrast to past professors who might assign work verbally or on a weekly basis. Both also mentioned liking the option to complete work ahead of time.
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I like looking ahead sometimes. Um- when I have free time so all the material and all the homeworks were available already. So I like that- that if I wanna do something earlier than- you know, than the due date I could.

- Student

A few problems were also mentioned. One student found that the drop down menus didn’t work well in mobile and tablet environments. One student mentioned there were a few broken links. A couple of students also suggested that prior familiarity with the OpenLab was really helpful for acclimating to the OER.

**The Openlab platform and Blackboard.** Students naturally drew connections between using the OpenLab platform and Blackboard in prior classes. Two students talked about needing a moment to adjust to not getting email notifications every time an assignment was due, or not receiving other tracking notifications that are routine with Blackboard. One student also suggested that the OpenLab adopt a feature like Blackboard’s, to generate more notifications for due dates, etc. Students noticed advantages to the OpenLab as well.

Like, like, I know like when you use Blackboard—Blackboard is always under construction and things like that, so it’s harder to logon, but I never encountered that with the OpenLab.

- Student

Another positive advantage a student noted of the OpenLab was the ability to read a course discussion thread with more ease than their prior experience with Blackboard, which hid student responses from other students.
I think that’s kind of a benefit for OpenLab because you could always be, oh I agree with this person and elaborate more. But the other one [Blackboard] it’s like, you’re just kind of- your own ideas, your own opinions, kind of.

- Student

Educational impact. Two students found that the OER made no difference to their learning habits besides offering more accessibility and convenience. Of these two, one mentioned liking the ability to flip back and forth in a textbook instead of scrolling. I asked this student if she had printed any of the course materials, and she said she had not. Three students preferred the OER much more than a textbook.

It made me more focused. Um- you know, um, with the textbook- I don’t like- I can get kinda lazy about it. But I go on the computer and, I- it’s something that I like to do so it kind of motivates me more to do it.

- Student

Another student felt the quizzes that came with the readings really helped her test her knowledge and review areas that she didn’t initially understand. A couple of students found the course readings to be far less overwhelming than a textbook because they could focus in on the important components. Another student mentioned her preference for watching videos, a learning habit she had developed independently by searching for YouTube videos related to other courses that did not integrate multimedia into the curriculum.

Positive attributes of online learning materials. The research that has emerged to explore online and distance education in an effort to understand and improve high rates of student
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attrition, can inform the design of OERs. In a qualitative study conducted with distance education students with special needs, students offered several suggestions to improve the online education experience. They shared their priorities for instructors to make expectations clear, use rubrics, have a detailed syllabus with due dates, create directions with step-by-step instructions, and have a tutorial available on how to use technology functionalities like an online discussion board (Catalano, 2014). These suggestions are relevant to any learning context, but they offer important insight into what students’ value in order to achieve success with learning materials. These suggestions are also consistent with City Tech students’ positive feedback on the reliability and clarity of using the OER.

**Conclusion**

Findings from this study indicate that most students had positive experiences using an OER as their primary course material. There are invaluable insights to be gleaned from student survey responses and particularly student interviews. While it is great news that the majority of City Tech students fared so well using their course OER, the survey results showed that there were a small amount of students who experienced difficulties; some experienced a lack of access to technology. However, the survey responses failed to capture other potential challenges students may have encountered. If we don’t know what went wrong for those students, we are in the dark. This is exactly why we must continue these kinds of studies because we can’t understand what we don’t know, and if we don’t talk to students, how will we learn?

Too often, educators and administrators are in the position to make decisions that may have the most lasting impact on students. In this study, I hoped to expose student voices to bring learners’ narratives in dialogue with pedagogical praxis. The emergence of OERs is an important pedagogical shift that needs the perspectives of learners and educators to be implemented.
How do OERs Impact Students? A Qualitative Study at New York City College of Technology effectively. As the OER movement reaches a defining moment in higher education, we must live up to our responsibilities by doing what we can to bring students to the center of the conversation.

**Limitations**

The strength of this study is its reliance on student perceptions which may present limitations because the data collected cannot be externally validated. Additionally, the method used to recruit students for interviews could have favored students with more schedule flexibility and better time coordination skills. This may have impacted the qualitative data sample and indicates that achieving a truly representative student sample is impossible to achieve. To clarify, as this was a qualitative study, surveys and interviews were not designed to contribute to statistical data on OER adoption.

**Future research**

We need more research about student user experience in relation to instructional design of OERs to inform future OER implementations, as Petrides et al. recommends. We also need to learn more about how students value their own academic success and how that impacts student responses to diverse learning and assessment materials that can be assembled with OERs. Similarly, how do educators’ ideas of what constitutes academic success influence their instructional design of OERs? We can begin to learn these answers by continuing to conduct individual interviews and focus groups with students and instructors.
Appendix A

How Open Educational Resources impact students

This survey is designed to get your feedback about using the Critical Health Psychology OpenLab course site instead of a traditional textbook.

1. How many semesters of college have you completed?

2. Have you used the OpenLab before taking this course?  Yes  No

3. What is your major?

4. In general, when classes require a textbook, how do you get access to it?

   All or most of the time  Regularly  Occasionally  Rarely/Never

   I purchase or rent the book.
   I use a library copy.
   I borrow someone else's book.

   Other.

   If "Other," please explain:

5. How do you access assigned readings on the Critical Health Psychology course site?

   All or most of the time  Regularly  Occasionally  Rarely/Never

   I print them out.
   I read them on a smart phone.
   I read them on a personal laptop or computer.
   I read them on a City Tech computer.
   I read them on a tablet.

6. If you printed out any readings for the course, why did you print?

   Check all that apply.

   I printed because I prefer paper.
   I printed because it is hard to access the readings online when I'm off campus.
   I printed because it is hard to access the readings online while I'm at City Tech. I printed because
   I wanted to take notes on the page.

   Other.

   If you selected "Other," please explain:
7. **How would you rate your overall ability to find what you need on the Critical Health Psychology course site?**

   - Extremely easy
   - Easy
   - Neither easy nor difficult
   - Difficult
   - Extremely difficult

8. **What challenges, if any, have you faced with accessing materials from the Critical Health Psychology course site?**

   Check all that apply.

   - Technological problems with downloading resources
   - Knowing where to find the resources
   - Taking notes on the resources
   - Printing the resources
   - Finding wifi to access the site on campus
   - Finding wifi to access the site off campus
   - Finding a device to access the site on campus
   - Finding a device to access the site off campus
   - No challenges

   Additional comments:

9. **How would you rate the overall quality of the readings in this course compared to a textbook in your other courses?**

   - Much worse
   - Somewhat worse
   - About the same
   - Somewhat better
   - Much better

10. **Rate your level of agreement with the following:**

    - Strongly agree
    - Agree
    - Neither agree or disagree
    - Strongly disagree
    - Available, but I don’t use this

    Posting or reading comments on the course site support my learning process.
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Powerpoint lectures support my learning process.
Online video lectures support my learning process.
Research articles support my learning process.
Links to other web resources support my learning process.
Required assignments support my learning process.
Required quizzes support my learning process.

11. **Rate your level of agreement with the following:**
   
   *Strongly agree*
   *Agree*
   *Neither agree or disagree*
   *Strongly disagree*

   Using the course site instead of a traditional textbook increased my participation in class.
   ...increased my interest in the course subject.
   ...increased my exposure to different ways of learning.
   ...increased my satisfaction with the learning experience.
   ...increased my engagement with the course lessons.
   ...improved my grade.
   ...built my confidence.

12. **In the future, how likely are you to register for a class that uses online resources instead of a traditional textbook?**

   *Extremely likely*
   *Likely Neutral*
   *Unlikely*
   *Extremely unlikely*
Interview Protocol

Please let me know your age, how many semesters you’ve completed at City Tech, your major/program, degree, and whether you’ve taken hybrid/online classes, or used e-textbooks before? Is English your first spoken language?

In this study I am interested in learning about how the Critical Health Psychology course site worked for students.

1. What has been your experience using the Critical Health Psychology course site for your course materials?

2. How is the Critical Health Psychology course site organized?

3. How would you describe the Critical Health Psychology course site to a friend using it for the first time?

4. How do you access this class’s course materials? For instance, what types of devices do you use to access the site and the materials on it?

5. Where do you do your work for this class?

6. Walk me through your routine for completing an assignment posted on the Critical Health Psychology course site?

7. How is using the Critical Health Psychology course site different from using a physical textbook?

8. How has using the Critical Health Psychology course site instead of a textbook impacted your studying/working habits?

9. Has the use of this course site made a difference to your studies?

10. Have there been any benefits to using the Critical Health Psychology course site?

11. Have there been any challenges to using the Critical Health Psychology course site?

12. What would you change about the Critical Health Psychology course site?
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