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Teaching and Learning Without a Textbook
Undergraduate Student Perceptions of Open Educational Resources

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Article abstract

Given the upsurge of textbook costs, college students increasingly expect universities and instructors to offer alternatives to traditional textbooks. One textbook alternative is using open educational resources (OER). While OER unquestionably save students money, the question remains whether the adoption of OER (instructional materials) is aligned with open pedagogy (methods). This study investigated 46 undergraduate students' perceptions of using only OER in an introductory course in a large American public university. As reported by study participants, advantages of using OER include textbook cost savings, access to dynamic and plentiful OER materials, that OER enabling mobile learning, and that OER foster the development of self-directed skills and copyright guidelines. Challenges reported include lacking a tactile sense with OER, slow Internet connections, unclear instruction and guidance, and insufficient self-regulation skills. Course design and implementation considerations were discussed.

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Abstract

Given the upsurge of textbook costs, college students increasingly expect universities and instructors to offer alternatives to traditional textbooks. One textbook alternative is using open educational resources (OER). While OER unquestionably save students money, the question remains whether the adoption of OER (instructional materials) is aligned with open pedagogy (methods). This study investigated 46 undergraduate students' perceptions of using only OER in an introductory course in a large American public university. As reported by study participants, advantages of using OER include textbook cost savings, access to dynamic and plentiful OER materials, that OER enabling mobile learning, and that OER foster the development of self-directed skills and copyright guidelines. Challenges reported include lacking a tactile sense with OER, slow Internet connections, unclear instruction and guidance, and insufficient self-regulation skills. Course design and implementation considerations were discussed.

Keywords: OER, open educational resources, open education, open pedagogy

Introduction

Omnipresent computers, the Internet, and associated technological developments have led to exponential growth in the use of Open Educational Resources (OER) in education (Blumenstyk, 2015). College instructors have increasingly incorporated OER into their teaching, either to supplement their curriculum or to replace traditional textbooks with e-textbooks entirely (Forsyth, 2016; Hilton, 2016). With increased development, publicity, and dissemination of OER, a recent "Opening the Textbook" survey of 2,700 instructors by Babson Survey Research Group (2017) revealed that the number of instructors at two-year and four-year institutions using OER in place of textbooks has nearly doubled from 5% in 2015-2016 to 9% in 2016-2017. Moreover, 29% of the surveyed instructors described themselves as "aware" or "very aware" of OER in 2017, compared to 25% in 2016 and 20% in 2015 (Babson Survey Research Group, 2017). While such data is exciting, the survey also noted that awareness of OER is still low, and that many instructors also reported significant barriers (e.g., finding and evaluating the quality of materials) to wider adoption of OER (Babson Survey Research Group, 2017).

Researchers have called for more empirical studies to determine student perceptions and experiences of using OER – either e-Textbooks or OER components, in teaching and learning in hopes of providing evidence about OER's efficacy and quality (Allen & Seaman, 2014; Hilton, 2016) as well as to help instructors develop a new set of skills and attitudes with open pedagogy (Annand & Jensen, 2017; Hegarty, 2015). Past studies usually investigate e-Textbooks or a partial adoption of OER components. The purpose of this study is to investigate using only OER to replace traditional textbooks in an introductory undergraduate course. It aims to discover how students perceive their experiences differently when only OER are adopted in teaching and learning. The study centers on the following research questions:

1. What advantages did students identify when using only OER in an undergraduate introductory course?

2. What challenges did students experience when using only OER in their learning process?

Literature Review

Forces Promoting the OER Movement

UNESCO first defined the term "Open Educational Resources" in 2002 as: "teaching, learning, or research materials that are in the public domain or released with an intellectual property license that allows for free use, adaption, and distribution" (UNESCO, 2002, p. 24). The ultimate goal of developing OER is "to enable the creation of free, universally accessible educational materials, which anyone could use for teaching or learning purposes" (Hilton, 2016, p. 574).

In the past two decades, several forces have greatly pushed the OER movement. The first force is the prices of the textbooks, which have increased by 82% in the last decade, and students spend an estimated $1,200 per year on textbooks (Affordable Learning Georgia, 2016). In the same time period as the aforementioned textbook price increase, a 7% average annual increase in tuition, fees, and housing occurred as well,

furthering student financial stress (Blumenstyk, 2015). A more recent survey of more than 22,000 college students had sobering results, as 53.2% of these students spent more than $300 on textbooks in a semester, and 17.9% spent more than $500 (Florida Virtual Campus Survey, 2016). Additionally, 66.6% of students did not purchase some required textbooks, and 37.6% of students earned a poor grade as a result. This survey indicated that many college students compromised their academic success because of the high cost of instructional materials. Clearly, the economic barrier of textbook costs on top of tuition is an important factor contributing to student academic failure.

In light of the information presented above, several OER initiatives have emerged to help increase student accessibility to learning materials. Firstly, institutional efforts to fund and spearhead the development of several OER emerged in the early 2000s, including the Hewlett Foundations' Strategic Plan to Increase Access to High-Quality Educational Context and UNESCO's Paris OER Declaration. Additionally, Wikipedia was launched in 2001 and has evolved into the biggest OER that exists. The Wikibooks platform curated numerous open textbooks, Web pages, and classroom projects (Lin & Kelsey, 2009). Moreover, non-profit organizations such as Openstax, Khan Academy, and the Saylor Academy emerged as leading providers of OER (Hilton, 2016). Secondly, upon determining that savings benefits of OER may systematically address the textbook problem in Higher Education, the U.S. Department of Education has launched a $4.9 million pilot program to create and expand academic OER materials for Higher Education in 2018 (Department of Education, 2018). Thirdly, there has been increasing proliferation in publishing and copyright, such as Creative Commons (CC) licensing, GLAMs (Gallaries, Libraries, Archieves, and Museums), and even for-profit companies such as YouTube and Flickr. In particular, CC licensing allows authors to decide how they wish to share their work, reserve their rights, or adjust the license to make their work more open, accessible for reuse, repurposing, and remixing (Kelly, 2014). Higher Education has also worked to support OER growth: a 25-member consortium of Higher Education institutions purchased course materials in bulk from textbook publishers and offered the digital format at a low cost to their students on the first day of a course (Unizin, 2018). Massive Open Online Courses (MOOCs) have also been rapidly adopted in Higher Education: The Open Education Consortium, which consists of hundreds of Higher Education institutions and associated organizations worldwide, spearheaded the creation and distribution of many free MOOC courses to attract a broader audience around the world in the early 2010s (edX, 2018; Lin, 2014).

While these positive initiatives foster the creation and dissemination of OER, researchers indicated that OER has not been systematically integrated into the curriculum due to several critical challenges including: the reality that open technology is still an unknown territory to most instructors (Babson Survey Research Group, 2017), the lack of institutional faculty support and development to integrate OER into curriculum (Annand & Jensen, 2017), and a lack of OER quality assessments to help faculty to choose from the multitude of OER options (Hilton, Bliss, & Wiley, 2013). The following section outlines a framework of open pedagogy. This framework serves as an anchor for instructors seeking to integrate OER into their curricular as well as demonstrates the challenges that exist for instructors.

Theoretical Framework of Open Technology

Readily accessible materials do not guarantee successful teaching and learning with OER. A model of open pedagogy by Hegarty (2015) used eight attributes to guide successful OER integration. Therefore, the model

served as a theoretical framework to guide the redesign of the course within which the study at hand was conducted.

1. **Participatory technologies**. OER technologies enable a participatory culture via tools such as blogs, wikis, videoconferencing, audio file sharing, online journaling and publishing, forums, and chats. However, technology itself does not guarantee a participatory culture to occur naturally (Hegarty, 2015). Instructors need to carefully select OER to encourage interaction, facilitate mobility, and support the development of communities of practice (Cochrane, 2014).

2. **People, openness, and trust**. In an open learning environment, students' willingness to learn, participate, and interact is fragile unless an element of trust can be built (Hegarty, 2015). With this, building confidence and connections among students is a logical step. This type of support engages learners to feel conformable, trusted, and valued as they access and interact with resources and each other (Kop, Founier, & Mak, 2011).

3. **Innovation and creativity**. The New Media Consortium (NMC) 2015 Horizon Report indicated that developing innovative models of learning with OER can foster personalized experiences and collaborative engagement. This attribute stresses that students should not be passive receivers of information by using OER and technologies, and that an open environment can promote innovation, creativity, and engagement in which students act as creators and collaborators (Johnson, Adams Becker, Estrada, & Freeman, 2015).

4. **Sharing ideas and resources.** This attribute states that students are exposed to effective practices in an open environment by sharing their knowledge, ideas, and projects and actively asking for assistance among a community of peers (Hegarty, 2015). Instructors need to adequately address students' reasonable questions such as: "What's in it for me?" "Why do I post my work on the Web?" "I don't want to have my work judged, as it might not be good enough" (Hegarty, 2015, p. 89).

5. **Connected community.** This attribute relates to Attribute 1 in that a connected community is not only important to promote collaboration and sharing via participatory technologies, but also critical to encourage students to function as a community member in OER-based courses (Hegarty, 2015). In the OER-based courses, which students may perceive as too open and less directive, it is important not just for instructors to clarify directions but to also help students adopt a more "peer-to-peer learning" attitude (Conole, 2013).

6. **Learner-centered environment.** Encouraging students to fully engage with OER in the learning process empowers then to take the lead, direct their own learning, solve problems, collaborate effectively, and share work meaningfully (Ehlers & Conole, 2010). Moreover, immersing students in OER encourages them to create learner-generated OER content so that they are able to produce creative work (Ehlers & Conole, 2010).

7. **Reflective practice.** A great part of learning comes from reflecting about what we do. According to Conole (2013), learning with OER is not just about generating experiences, but also about making

time to process those experiences, and reflective practice is an integral part of OER course design and teaching. Students must also have opportunities to reflect and receive feedback from their instructors and peers (Conole, 2013).

8. **Peer review.** While open peer review serves as the foundation to perform in a participatory culture, this approach can pose challenges for some students. Fear of criticism, self-doubt about quality of work, difficulty evaluating the quality of OER, and hesitancy to critique peers' work are some of the common concerns identified by students using OER in their projects (Conole, 2014). From this, researchers recommend that instructors teach students how to evaluate OER quality and model OER integration into student projects (Conole, 2013; Richter & Ehlers, 2011).

After a review of the attributes of open pedagogy, the following question naturally arises: how do students perceive their learning with OER replacing traditional textbooks? In other words, when the opportunities are made available, will students take them? The following section reviews emerging literature on student perceptions.

Student Perceptions of OER

Literature on student perceptions and experiences of OER is still in an early phase of development. Several large-scale studies have investigated student responses to courses using OER either as e-Textbooks or OER components. Hilton, Gaudet, Clark, Robinson, and Wiley's (2013) survey of 1,400 students resulted in 910 responses. Within this survey, 83% of students reported that OER supported their work outside of the class, and 78% of the students would recommend OER to their peers (Hilton, Gaudet, Clark, Robinson, & Wiley, 2013). Feldstein et al. (2012) conducted a survey of 1,393 students about OER. Of the 315 students who responded to the survey, about two-thirds of students "strongly agreed" or "agreed" that they preferred the OER content to traditional textbooks (Feldstein et al., 2012). About one third of the students reported problems with the quality and credibility of the OER content (Feldstein et al., 2012). A third large-scale study on student perceptions involved 345 students in a computer science course who created an OER-supported blog project incorporating two major OER components into their classes (Gil, Candelas, Jara, Garcia, & Torres, 2013). Of the 345 students, 150 (43%) indicated that a blog using OER was better than a blog without OER support, however, 15% of the students favored non-OER blogs (Gil et al., 2013). In another survey of 1,830 students, 79% of 126 respondents reported overall satisfaction with OER integration into the curriculum, while 17% were undecided and 4% were dissatisfied with the quality of the OER (Pitt, Ebrahimi, McAndrew, & Coughlan, 2013).

To sum up, the majority of the surveyed students in the abovementioned studies noted that using OER helped them not only with textbook cost savings, but also positively impacted their learning experiences with OER. One challenge that a limited number of students identified was evaluating OER for quality and credibility.

Method

Participants

Fifty-eight students enrolled in an introductory education course in a large American public university. Forty-nine of them majored in elementary and secondary education, eight in health and physical education, and one in French. Fifty-two students (89.6%) were freshmen and sophomores, and six were senior students. There were 35 female students and 23 male students, and all participants were between the ages of 18 to 21.

Context of the Study

The introductory education course traditionally required students to purchase a $60 textbook. The goals of the course were twofold: promoting the effective integration of technology into lesson plans (technologies focus) and the integration of OER into lesson plans (OER focus).

To meet these goals, the course instructor spent more than 250 hours evaluating and contextualizing OER into the course content. Examples of selected OER as instructional materials included tutorials, lesson plans, journal articles, video clips, case studies, documentaries, blogs, WebQuest entries, library databases, online professional discussion forums, and state and national teacher evaluation criteria. Links to OER content were embedded in weekly modules and provided in a learning management system (LMS) – Desire2Learn. Meanwhile, students in the course were not strictly passive consumers of OER, but instead were "active creators" of OER artifacts as well (Johnson et al., 2015). Some examples of assignments that built upon OER included: the creation of five lesson plans with instructional technologies and OER components, the development of an open blog, weekly face-to-face and online discussions supported by OER references, and peer review of projects based on OER content.

The course employed blended instruction. Students met twice a week in class on Mondays and Fridays and had online discussions and assignments on Wednesdays in the LMS. One example of students using OER to interact was about teaching Internet Safety to elementary students. Students in the course met in class and watched a recent video from a local TV station, explaining how a middle school student was killed by a stranger she met online. Before students in the course recovered from the shock, they were asked to use their devices to explore a national Website, which listed details of child sex offenders in their neighborhoods. Infused with shock, anger, and a strong sense of responsibility to teach young kids about Internet Safety, students formed small groups to brainstorm their lesson plans. After the class, the groups developed their lesson plans including at least three OER-supported references. Afterwards, they received feedback from peers and the instructor online before submitting their final papers.

Data Sources

Data were collected through two sources: an anonymous online survey and two focus groups. First, a reflective survey was designed by the instructor and reviewed by a faculty member who is an expert on education and OER. In addition to demographic questions about gender and age, the survey had four open-ended questions. It took 10-15 minutes to complete in the course LMS. The four open-ended questions included in the survey were:

1. Have you taken any course before in which teaching and learning occurred without a traditional textbook?

2. What do you like about only using OER in teaching and learning?

3. Did the OER content in this course help you learn the same as textbooks would have?

4. What challenges did you experience with OER in your learning and assignments?

A pilot study was administered with five randomly chosen students from the class to ensure the clarity of the questions. Of the 58 students enrolled in the course, 46 (79.3%) took the reflective survey, including 30 females and 16 males. All 46 students indicated that this course was their first course in which OER were used to replace traditional textbooks entirely.

The second data source was two focus groups conducted after the reflective survey, each lasting 20-25 minutes. Of the students surveyed, 29 of 46 (63%) also participated in one of the two focus groups. Building on initial responses in the reflective survey, the focus groups asked more specific questions to generate in-depth examples that may not be shared by the reflective survey. As suggested by Van Manen (1990), the advantage of in-depth interviews is that the researcher can discover the meaning of the lived experience directly from the participants' perspectives.

Data Analysis

The course instructor and a faculty member conducted the data analysis. First, after the reflective survey data had been collected, we followed the constant comparison techniques described by Strauss and Corbin (1990). Following Strauss and Corbin's framework, we first employed the free and open-coding technique, which involves "the naming and categorizing of phenomena through close examination of data" (1990, p. 62). This stage involved exploring and examining survey data to identify common themes, patterns, regularities, and irregularities. Recurring words, themes, and patterns emerged. We, therefore, began to regroup themes and patterns that were conceptually congruent.

After data from the focus groups had been collected and transcribed, we used the same open-coding technique to identify common themes. After identifying recurring patterns and themes from both the reflective survey and focus groups, the researchers began to triangulate data using axial coding. This method makes connections within and between groupings and allows for new combinations of data (Strauss & Corbin, 1990). Where necessary, patterns and themes were regrouped in accordance with the axial coding method as they emerged. Eventually, we categorized the data based on a collection of aggregated instances. In cases of disagreement, we discussed and resolved differences and reached inter-rater agreement at 90%.

Results

Research Question 1

What advantages did students identify when using only OER in an undergraduate introductory course? Data analysis indicated that 39 out of 46 (84.7%) students who took the reflective survey and 25 out of 29 (86.2%) students who participated in the focus groups reported that they appreciated that there was not a required textbook in this course. Several themes concerning the advantages of using only OER emerged from the two data sources. These themes are discussed in detail below.

Cost saving. First and foremost, students knew from their senior counterparts or past instructors that a $60 textbook, with a new edition every year, had been traditionally required in this course. For this reason, 84% of the 46 students who took the reflective survey, and 88% of the 29 in the focus groups expressed overwhelming satisfaction with using OER in place of a traditional textbook. One student's comment was representative of many students' perceptions:

> One of the best things in this course is that there was no a required textbook. This is an introductory course, and I know a newer version is out every year. Thank you for not asking us to buy another expensive textbook when all we need is online.

Another participant added: "Technology is the way of the future. Textbooks are overpriced and soon to be outdated. The Internet and a printer are far better than a textbook because of the open resources available online." Clearly, the students were concerned about the upsurge in textbook costs. They appreciated that only OER were used in the course. As one student summarized, "I don't see why we need another expensive textbook when OER can do a great job as well, or even better."

Dynamic and plentiful materials. Another recurring theme was that OER enriched student learning because of the dynamic, multimedia online resources. One student explained the situation:

> This is an introductory technology course. It makes sense that we used OER to learn technology in a digital age. It would be a waste if we had to "read technology"' in a textbook. That will help us use OER effectively when we become teachers.

Another student noted: "I enjoyed not having to buy a book. I think I benefited as much from OER as I would have from a traditional textbook. It is the BEST CHOICE to make an introductory course interesting." Interestingly, this student's comment was not solely about the cost saving of OER, but highlights the way in which the use of OER can actually make a course more interesting. Another student noted:

> I am a third-year student taking this introductory course that I didn't take before. I never had a course that only used OER. It worked great in this introductory course. I hope my professors will use more OER in my senior year.

These comments indicate that students perceived multimedia-enriched OER as effectively contributing to their learning and viewed OER integration to be appropriate for an introductory course.

Mobile learning. The third most identified theme from the triangulated data is about OER and mobile learning. Specifically, 30 of 46 (65.2%) students who took the reflective survey and 23 of 29 (79.3%) in the focus groups indicated that OER enabled their mobile learning. One student noted that:

> Digital is much better as long as you have access to a computer at any time you need. There was no need for a textbook in this course and in several introductory courses I've taken either. All I need is online in the course site.

This student contextualized the convenience of not carrying a textbook into his or her mobile learning experience. One student added: "OER are simpler, and it is easier to get the homework done. When all my readings and submissions are online, I only need a computer to do my homework. I do not like dealing with textbooks and pens. Very cool." Another student also noted: "When I go to the class, the Libraries, or the Union, I can forget to bring my textbook, but I will never forget my laptop." These comments indicate that students perceived OER as a great convenience for mobile learning.

OER evaluation and copyright. Data analysis showed that 26 of 46 (56.5%) students in the reflective survey and 20 of 29 (68.9%) in the focus groups also commented on OER instructions in the context of the course. Some students indicated that course assignments encouraged students to pay due attention to copyright issues and the reliability of OER content. One student explained: "I learned to look closely whether the site is reliable and updated, and whether it is copyright free. These skills will definitely help me prepare my lesson plans when I become an in-service teacher in the future." Given that some OER might, at a glance, appear as legitimate sources when in fact they are not, the course instructor exerted great effort to help students evaluate OER and be cognizant of copyright implications for their assignments. One student commented on the instructor's effort: "I am glad that the professor often talked about copyright and fair use guidelines in the class. She made sure that our lesson plans had OER-supported activities and we didn't just copy and paste others' online lesson plans." Another student further explained that: "I got to know that some OER in the open domain can still have copyright implications." These comments indicated that simply providing OER was not enough to help students learn effectively.

In sum, students appreciated not having to purchase and carry textbooks, and their experiences with OER were positive overall. Students in the present study identified several major advantages of using only OER to replace traditional textbooks, summarized in Table 1. No outliers were found for the advantages of OER.

Table 1

Advantages of Using Online Resources to Replace Textbooks

Advantages	Descriptions
1. Cost Saving	Helps alleviate students' financial stress; encourages alternative textbook solutions.
2. Dynamic & Plentiful Materials	Motivates use of multiple learning styles; includes potentially unlimited resources not possible with the limited space of a print textbook.
3. Enabling Mobile Learning	No need to carry textbooks; encourage mobile learning in a digital age.
4. Supporting OER Evaluation Skills and Understanding Copyrights	Develops skills to evaluate and select reliable online materials; helps students become more copyright conscious.

Research Question 2

What challenges did students experience when using only OER in their learning process? Although the majority of the students appreciated a textbook alternative in the course, they also experienced some challenges in using only OER as the course materials. The following section addresses these challenges in detail.

The tactile sense. As seen in the data collected, 8 of 46 (17.3%) students in the survey and 7 of 29 (24.1%) students in the focus groups described "missing" the experience of working with a tangible textbook. Specifically, these students liked the touch of a book, and felt as though books made it easier for them to take notes. One student wrote:

> When it comes to studying, I would like to have a book with me. I like to feel it, read it, and take notes wherever I want instead of relying on a computer. OER are good to supplement the course, but I prefer to have a book at my fingertips.

This sentiment was not unique. Another student added: "If quizzes are going to be given, then something needs to be in print so students like me can have something on hand to study because I am a visual learner." Another student echoed that: "I feel like when it comes to prepare my final exam and homework, I really wish I could have a textbook in front of me." These comments indicated that some students missed the tactile sense of a textbook, and they believed that a traditional textbook was better than the intangible OER when it came to preparing for their exams and homework.

Internet accessibility. In terms of Internet accessibility, 31 out of 46 (67.3%) students lived off campus, and seven students indicated that they had Internet access, but they did not have high-speed Internet connections. One student expressed the following concern: "I like OER, but I don't have high-speed Internet in my apartment. I prefer to do my homework when I come to the campus." Another student added:

> I live off campus and don't have a fast Internet connection. I had to use computers on campus a lot to go over online materials. Sometimes, it was just easy to have a book on hand, read it, and do the assignments.

These students felt frustrated doing homework with a slow Internet connection. As a result, a course using only OER posed real challenges to their learning. One student explained the situation further: "I found it very challenging to do homework with solely OER in this course. If I lived on campus like last year, I should be fine, but my off-campus apartment this year doesn't have high-speed Internet."

Instruction and guidance. Six students in the survey reported that instructions of using OER were not clear to them. One student provided some context:

> I feel like I need the professor's help all the time because the scope of OER is too big. Also, some quiz items had nothing to do with what was discussed in class. I may have read it somewhere online, but I don't remember.

One student expressed the need for additional guidance due to the broad scope of OER used in the course: "I definitely need more help for the assignments because the amount of the online resources is just overwhelming." Wanting extra guidance could also be correlated with students' concern about not having a tangible textbook. Another student mentioned the same concern: "While I appreciate so much not to buy a textbook and I like OER in this course, I have to admit I got lost sometimes. You have to follow the professor's instructions and ask questions in a timely manner."

Self-regulation skills. Self-regulation "is the self-directive process by which learners transform their mental abilities into academic skills" (Zimmerman, 2002, p. 65). In the context of OER, it refers to the ability to stay focused and on track when using OER. Six students in the study also experienced lack of self-monitoring skills when learning with OER. They found it all too easy to spend hours visiting different Websites and often strayed from their purpose when their initial intention was to browse relevant OER for their assignments. One student described the double-edged sword of using OER: "Using only OER like this course is exciting as well as dangerous. If you don't keep an eye on where you visit, you can surf on the Internet forever and totally forget about your assignments." Another student reported a similar experience: "I found myself clicking on one link after another. I can easily spend hours visiting different Websites, like when you are on YouTube." Such comments indicated that the students could easily get sidetracked if they did not consciously monitor their time using OER, and that conscious monitoring of one's time using OER may be important to ensuring that students maintain focus on their coursework and learning. Table 2 summarized the challenges experienced by students, which did not reveal any outliers.

Table 2

Challenges When Using Only OER

Challenges	Descriptions
1. Lacking the Tactile Sense	OER are not tangible and cannot be physically annotated; there is nothing to read in hand to prepare for quizzes.
2. Slow Internet Connection	Some students cannot study at home because they do not have high-speed Internet connections off campus.
3. Unclear Instruction and Guidance	Need clearer and/or additional instructions on assignments; need extra guidance when using OER.
4. Insufficient Self-Regulation Skills	Can easily stray from the required OER and browse other sites; need time management and self-monitoring skills to stay on task.

Discussions and Implications

This study investigated 46 undergraduate students' perceptions of using only OER in an introductory course in a large American public university. OER advantages that students identified include textbook cost savings, that OER materials are dynamic and plentiful, that OER enable mobile learning, and that the use of OER can help students develop skills to evaluate and select reliable online materials and better understand copyright guidelines. Challenges that students experienced include missing the tactile sense (commonly associated with textbooks) when using OER, slow Internet connections, unclear instruction and guidance, and insufficient self-regulation skills. Based on these findings, several recommendations were drawn up for pedagogical purposes.

Course Structure and Preparation

The study examined an introductory course on technology integration. With this, students may have been primed to embrace OER (Cochrane, 2014). Further research is needed to better understand whether courses not specifically geared toward technology would have similar perceptions. Instructors should take into the consideration the nature of the course when deciding the weight of OER in a course (Hilton et al., 2013).

This study also found that course level, introductory or advanced, was an important factor affecting student perceptions of using OER to replace textbooks. In this study, some students indicated that since it was an introductory course that covered basic knowledge and practices, OER, therefore, would likely be widely available. The course instructor, however, did not make this same assumption. When looking for potential OER, the instructor experienced a great challenge in selecting quality OER content and in customizing

course design based on plentiful OER content. Such a challenge is in line with the literature. In a study of 2,700 instructors, it was revealed that challenges in evaluating quality OER were a great barrier of OER adoption (Babson Survey Research Group, 2017). Eighty instructors in eight colleges also reported that they spent a lot more time preparing for teaching because they were adapting and revising existing OER, or they were developing assignments and materials specific to OER content (Hilton, Bliss, & Wiley, 2013). It is recommended that instructors start small by incorporating a few OER components into their courses, and then add more OER gradually (Conole, 2013; Hegarty, 2015).

Student Learning with OER and Copyright

Teclehaimanot, Mentzer, and Hickman (2011) found that many instructors talked about integrating technology into their curriculum, but few provided students with exercises and activities to help them develop technology integration skills. The literature also suggests that students found it challenging when they were expected to evaluate the quality and credibility of OER content and incorporate such content into their discussions, assignments, and collaborative projects (Conole, 2013; Hegarty, 2015). When OER are used predominately in a course, students should learn to navigate OER content, and instructors should learn to teach students how to use OER to enhance collaborative thinking, perspectives, and mentoring (Bonk & Lee, 2017; Brown & Munger, 2010).

Another consideration for instructors is the importance of modeling copyright and fair use practices. The Digital Citizen Project from Illinois State University reiterated that digital natives do not necessarily have a solid understanding of intellectual property when using online materials for personal and academic purposes (Digital Natives and Intellectual Property, 2007). As indicated by some students in the present study, it is helpful for instructors to discuss copyright and model fair use on an ongoing basis in class. Students thereby become more copyright conscious when using online materials in general and in OER in particular.

Self-Regulation Skills and Connected Community

The present study found that self-monitoring is more critical when using only OER compared to when using traditional textbooks. Undoubtedly, it was tempting for students to explore additional OER outside the scope of the course, and not all students have self-monitoring skills in an OER-only pedagogy (Conole, 2014). The findings of the present study supported Bonk and Lee's (2017) study that students who stayed on task and satisfactorily completed their assignments in a timely manner benefited most from OER. Only six students identified challenges with self-regulation skills. Therefore, a correlation between unclear instruction and guidance and insufficient self-regulation skills cannot be safely concluded. However, one way that instructors can help students develop their self-regulation skills is to have their peers share their best self-directed learning strategies in an open environment (Chu & Tsai, 2009).

Instruction and Guidance

Clear instruction and guidance on using OER foster personalized learning experiences, problem solving, and critical thinking skills (Johnson et al., 2015). It is recommended that instructors continuously model OER evaluation, fair use, and general copyright guidelines, as well as learning strategy adaptations when new resources and opportunities are offered online (Kelly, 2014). By self-monitoring their own learning processes, students become meta-cognitively and behaviorally active in their own learning, so they are able

to navigate unfamiliar environments (Anderton, 2006; Bonk & Lee, 2017). Meta-cognitive strategies include planning, setting goals, monitoring actions, and evaluating progress. Behavioral strategies include choosing, adapting, and creating an environment for learning that optimizes learning experiences (Anderton, 2006).

Additionally, it is recommended that instructors repeat the instructions for assignments in different locations such as in the syllabus, in class, via e-mails, or through the course management system, as well as in assignment feedback, peer review, or reflective practices (Hilton & Bliss, 2013; Richter & Ehlers, 2011).

Technical Challenges

One challenge that students identified in the study was poor off-campus Internet connection. It is recommended that instructors make students aware of the possible challenges of using OER early in the course. Instructors could also offer some effective learning strategies to students such as avoiding procrastination, prioritizing tasks to study OER when on campus, and communicating with the instructor in a timely manner. Meanwhile, instructors need to be flexible concerning the design of assignments, due dates, and grading procedures in view of these challenges (Gil et al., 2013; Kelly, 2014). Flexibility is particularly important in the initial phase of implementation of OER (Feldstein et al., 2012).

Using only OER as instructional materials can also pose particular challenges to instructors. To ensure that the links of OER content remain active, the instructor of this study had to check regularly before and during every week of instruction, which required additional time and efforts compared to using a traditional textbook. Moreover, the course instructor realized that a course based on OER might lead to endless revisions when the instructor and the students identified better OER components after the completion of the course design. Just as students must develop self-monitoring skills, instructors must monitor their revisions so that they can focus on instruction rather than ceaseless course redesign (Cochrane, 2014; Johnson et al., 2015).

Contributions and Future Research

The study added new knowledge to the field of OER. Since most OER studies focus on the full adoption of e-Textbooks or partial adoption of OER components, this study investigated students' experience when using only OER in a course. The findings of the study at hand may contribute to course design, teaching, and faculty support of OER.

While the study provides insights concerning student perceptions of using only OER to replace traditional textbooks, it was limited by its small sample. Although identified OER benefits and challenges are consistent, the study can serve as a case study to aid further studies with larger populations to determine the mean value of the findings as well as pinpointing outliers. Additionally, since the course was focused on educational technology practices and stressed self-directed learning, the findings could be confounded by factors such as students' likes and dislikes of the course content, perceptions of self-regulated learning, technology skills prior to the course, and variations in the availability and quality of OER in different fields.

This study nonetheless provides a set of baseline data for future research that warrants further attention. Future research should investigate, in greater depth and in broader scope, whether the course level

(introductory vs. advanced course), nature of a course (technology-based vs. non technology-based course), instructor differences (OER novice vs. expert), student standing (freshmen vs. seniors), and class attendance (active vs. absent) make a difference in selecting, incorporating, and teaching with OER effectively when OER serves as the only instructional materials or as a supplement (Hegarty, 2015; Hilton & Bliss, 2013). Future research can also examine how to develop mechanisms to help instructors integrate OER into curriculum effectively and efficiently and to help students develop self-monitoring skills in an open learning environment (Hilton et al., 2013; Hilton, Bliss, & Wiley, 2013; Johnson et al., 2015).

References

Affordable Learning Georgia. (2017). About: ALG statistics, research, and reports. Retrieved from https://tinyurl.com/ydx4m5kb

Allen, I. E., & Seaman, J. (2014). Opening the curriculum: Open educational resources in U.S. Higher Education. Retrieved from https://tinyurl.com/yb5k9mbt

Anderton, B. (2006). Using the online course to promote self-regulated learning strategies in pre-service teachers. *Journal of Interactive Online Learning*, *5*(2), 156-177. Retrieved from http://tinyurl.com/y4gnuv36

Annand, D., & Jensen, T. (2017). Incentivizing the production and use of open educational resources in higher institutions. *International Review of Research in Open and Distributed learning*, *18*(4). http://dx.doi.org/10.19173/irrodl.v18i4.3009

Babson Survey Research Group (2017). Opening the textbook: Educational resources in U.S. Higher Education. Retrieved from https://tinyurl.com/yaswp264

Blumenstyk, G. (2015). *American higher education in crisis?* New York, NY: Oxford University Press.

Bonk, C.J., & Lee, M.M. (2017). Motivations, achievements, and challenges of self-directed informal learners in OER and MOOCs. *Journal of Learning for Development*, *4*(1), 36-57. Retrieved from http://tinyurl.com/y5o7mpp5

Brown, R., & Munger, K. (2010). Learning together in cyberspace: Collaborative dialogue in a virtual network of educators. *Journal of Technology and Teacher Education*, *18*(4), 541-571. Retrieved from https://eric.ed.gov/?id=EJ920714

Chu, R., & Tsai, C. (2009). Self-directed learning readiness, Internet self-efficacy, and preferences towards constructivist Internet-based learning environments among higher-aged adults. *Journal of Computer Assisted Learning*, *25*(5), 489-501. Retrieved from http://tinyurl.com/y52jzrvb

Cochrane, T. (2014). Critical success factors for transforming pedagogy with mobile Web 2.0. *British Journal of Educational Technology*, *45*(1), 65-82. https://doi.org/10.1111/j.1467-8535.2012.01384.x

Conole, G. (2013). *Designing for learning in an open world*. New York, NY: Springer.

Conole, G. (2014). The 7Cs of learning design: A new approach to rethinking design practice. In S. Bayne, C. Jones, M. De Laat, T. Ryberg, & C. Sinclair (Eds.), *Proceedings of the 9th International Conference on Networked learning 2014* (pp. 502-509). Lancaster University. Retrieved from https://www.lancaster.ac.uk/fss/organisations/netlc/past/nlc2014/abstracts/pdf/conole.pdf

Digital Natives and Intellectual Property. (2008). *In Illinois, digital citizen project will track illegal student downloads*. Retrieved from https://tinyurl.com/y8q7pqfw

Department of Education. (2018, October 3). *U.S. Department of education awards $4.9 million grant to University of California, Davis to develop free, open textbooks program* [Press release]. Retrieved from https://tinyurl.com/y8agbagk

Ehlers, U-B, & Conole, G. (2010). *Open educational practices: Unleashing the power of OER*. Paper presented at the UNESCO Workshop on OER, Namibia. Retrieved from http://tinyurl.com/y2w7ut3a

edX. (2018). OECx. Retrieved from https://www.edx.org/school/oecx

Feldstein, A., Martin, M., Hudson, A., Warren, K., Hilton, J., & Wiley, D. (2012). Open textbooks and increased student access and outcomes. *European Journal of Open, Distance, and E-Learning*, 2, 1-9. Retrieved from https://eric.ed.gov/?id=EJ992490

Florida Virtual Campus Survey. (2016). *2016 student textbook and course materials survey*. Retrieved from https://tinyurl.com/y8atoc7h

Forsyth, D. R. (2016). *College teaching*. Washington, DC: American Psychological Association.

Gil, P., Candelas, F., Jara, C., Garcia, G., & Torres, F. (2013). Web-based OERs in computer networks. *International Journal of Engineering Education*, *29*(6), 1537-1550. Retrieved from http://tinyurl.com/y4vxyeeh

Hegarty, B. (2015). Attributes of open pedagogy: A model for using open educational resources. *Educational Technology*, *55*(4), 3-13. Retrieved from http://tinyurl.com/y2tpd3ho

Hilton, J. (2016). Open educational resources and college textbook choices: A review of research on efficacy and perceptions. *Educational Technology Research and Development*, *64*(4), 573-590. https://doi.org/10.1007/s11423-016-9434-9

Hilton, J., Bliss T. J., & Wiley, D. A. (2013). An OER coup: College teacher and student perceptions of open educational resources. *Journal of Interactive Media in Education*, *1*(4), 1-25. http://doi.org/10.5334/2013-04

Hilton, J., Gaudet, D., Clark, P., Robinson, J., & Wiley, D. (2013). The adoption of open educational resources by one community college math department. *The International Review of Research in Open and Distributed Learning*, *14(*4), 37-50. http://dx.doi.org/10.19173/irrodl.v14i4.1523

Johnson, L., Adams Becker, S., Estrada, V., & Freeman, A. (2015). *New media consortium (NMC) horizon report: 2015 higher education edition*. Retrieved from https://tinyurl.com/y8oayoqe

Kelly, H. (2014). A path analysis of educator perceptions of OER using the technology acceptance model. *The International Review of Research in Open and Distributed Learning*, *15*(2), 26-42. http://dx.doi.org/10.19173/irrodl.v15i2.1715

Kop, R., Fournier, H., & Mak, J. (2011). A pedagogy of abundance or a pedagogy to support human beings? Participant support on massive open online courses. *International Review of Research in Open and Distributed Learning*, *12*(7), 74-93. http://dx.doi.org/10.19173/irrodl.v12i7.1041

Lin, H. (2014). Going to college online? A PEST analysis of MOOCs. *Journal of Educational Technology Systems*, *42*(4), 369-382. Retrieved from https://eric.ed.gov/?id=EJ1125955

Lin, H., & Kelsey, K. D. (2009). Building a networked learning in wikis: The evolving phases of collaborative learning in a wikibook project. *Journal of Educational Computing Research*, *40*(2), 141-165. Retrieved from http://tinyurl.com/y56tqt7b

Pitt, R., Ebrahimi, N., McAndrew, Pl., & Coughlan, T. (2013). Assessing OER impact across organizations and learners: Experiences form the bridge to success project. *Journal of Interactive Media in Education*, *3*, 1-16. http://doi.org/10.5334/2013-17

Richter, T., & Ehlers, U-D. (2011). Barriers and motivators for using OER in schools. *eLearing Papers*, *23*, 1-7. Retrieved from http://tinyurl.com/ybabsc8b

Strauss, A., & Corbin, J. (1990). *Basics of qualitative research.* Newbury Park, CA: Sage.

Teclehaimanot, B., Mentzer, G., & Hickman, T. (2011). A mixed methods comparison of teacher education faculty perceptions of the integration of technology into their courses and student feedback on technology proficiency. *Journal of Technology and Teacher Education*, *19*(21), 5-21. Retrieved from https://eric.ed.gov/?id=EJ932211

UNESCO. (2002). *Forum on the impact of open courseware for higher education in developing countries*. Retrieved from https://tinyurl.com/9y8hldg

Unizin. (2018). About. Retrieved from http://unizin.org/about/

Van Manen, M. (1990). *Researching lived experience.* Albany: State University of New York Press.

Zimmerman, B.J. (2002). Becoming a self-regulated learner: An overview. *Theory Into Practice*, *41*(2), 64-70. Retrieved from http://tinyurl.com/y3vjn5n9