



# The undefined figure: Instructional designers in the open educational resource (OER) movement in higher education

Xinyue Ren<sup>1</sup> 

Received: 11 February 2019 / Accepted: 7 June 2019 / Published online: 20 June 2019

© Springer Science+Business Media, LLC, part of Springer Nature 2019

## Abstract

The paper aims to discuss the role of instructional designers (IDs) in supporting the Open Educational Resources (OER) movement in higher education. Due to the increasing cost of higher education, previous studies indicated the feasibility of adopting OER to lower students' educational expenses and to equalize their learning opportunities (Murphy in *Distance Education*, 34(2), 201–217, 2013; Okamoto in *Public Services Quarterly*, 9(4), 267–283, 2013). However, many instructors and staff are facing various barriers to adopting OER, such as the lack of time, motivation, and knowledge of quality evaluation (Taylor and Taylor in *Online Journal of Distance Learning Administration*, 21(2), 1–8, 2018). IDs often serve as learner analysts, instructional innovators, and leaders in educational technology to assist instructors in developing teaching materials. However, limited research studied their partnerships to overcome the barriers of creating and adopting OERs in universities and colleges. Hence, the paper will propose a viable solution to include IDs in overcoming OER adoption barriers and promoting the OER movement in higher education. The findings may contribute to the field of OER movement and pave the way for future research.

**Keywords** Instructional designers (IDs) · Open educational resources (OERs) · OER adoption · OER movement · Partnerships between instructors and instructional designers

## 1 Introduction

Higher education in the United States is expensive, which leads to serious financial challenges and access barriers for many students, especially disadvantaged and underrepresented student populations (Flores and Shepherd 2014; Kerkvliet and Nowell 2014;

---

✉ Xinyue Ren  
xr868414@ohio.edu

<sup>1</sup> Ohio University, McCracken Hall, Athens, OH 45701, USA

Nguyen 2010). According to the recent statistics, the cost of attending college and university has increased dramatically in the past few decades (Hemelt and Marcotte 2011). From 2000 to 2016, the annual tuition and fees for students attending four-year public higher education institutions increased by about 120% (National Center for Education Statistics 2018). In addition to the tuition and fees, students have to pay other expenses, such as housing, meals, books, supplies, and transportation, which leads to additional financial burdens (Ikahihifo et al. 2017). From 2000 to 2018, the price of textbooks has increased by around 142% (United States Department of Labor 2018). For specific subjects, students may be required to buy extra learning materials, such as software or course codes. Therefore, in addition to the tuition and fees, all of these extra expenses lead to heavy financial pressure for many students, especially students who struggle to pay off their student loans after graduation (Okamoto 2013).

### 1.1 A practical solution for overcoming financial barriers in higher education

Usually, the rise of higher education attendance costs produces financial barriers, which cause accessibility and retention problems for current and prospective students (Ikahihifo et al. 2017). However, faculty and students rarely have power to control the increase of tuition and fees. The effort to provide affordable and accessible learning materials, integrating open textbooks and educational materials, seems to be the most practical approach that faculty can adopt to save students money (Illowsky et al. 2016; Ikahihifo et al. 2017).

The idea of open education has shown up to draw the public's attention since 2001 (Belikov and Bodily 2016; Ikahihifo et al. 2017). Open education aims to remove copyright, financial, and technology barriers. It also refers to the practices of freely sharing high-quality learning materials and providing affordable and accessible learning opportunities for everyone, such as massive open online courses (MOOCs), products with a Creative Commons (CC) license, and open educational resources (OER) (Murphy 2013).

OER refers to free and accessible learning materials, including textbooks, videos, course modules, and evaluation tools. Instructors are allowed to reuse, repurpose, or revise them according to their specific teaching objectives (Hilton III et al. 2014). According to the study conducted by Belikov and Bodily 2016, OER adoption in higher education can provide equal learning access to the students. Thus, adopting open educational materials seems to be a feasible and practical approach to save students costs, increase inclusion, and potentially enhance students' learning outcomes (Belikov and Bodily 2016; Bliss et al. 2013; Grewe and Davis 2017; Murphy 2013; Okamoto 2013; Piña and Moran 2018).

### 1.2 Undefined figure: Instructional designers (IDs) in the OER movement

However, instructors often face challenges and difficulties when adopting and reusing OER for their classes. For example, many teachers lack time, motivation, and institutional support to design and develop OER; they have limited knowledge of copyright and quality evaluation; and they need the collaboration with other staff while adopting OER (Lindshield and Adhikari 2013; Murphy 2013; Taylor and Taylor 2018). There is a need to search for various resources and provide enough support to successfully achieve the OER movement in higher education.

One possible solution is to encourage the collaboration between faculty and instructional designers (IDs) (Taylor and Taylor 2018). IDs are experts in the field of instructional strategies and course development. They usually work with faculty members to address several issues, such as designing and implementing course materials to better solve instructional problems or to meet specific learning objectives and conducting quality assessment. IDs often play an important role in providing strategies for delivering information in an effective manner to enhance students' learning outcomes (Morrison et al. 2010). While thinking about the importance of IDs in supporting teaching in higher education, there is a rationale to examine the effectiveness of building partnerships between IDs and faculty to overcome the OER adoption barriers in higher education institutions, such as the lack of time, expertise, or supportive resources.

For example, an OER initiative project conducted in Sullivan University include both faculty and IDs. Faculty, served as subject matter experts (SMEs), collaborated with IDs to redesign the courses with OER adoption, which positively affected the use of OERs and the quality of OER-based courses (Piña and Moran 2018). In these cases, faculty only needed to choose the materials from available OERs, rather than producing their own content. In this way, IDs could assist faculty in replacing traditional resources with OERs, identifying appropriate OERs to achieve the learning objectives, redesigning OER-based courses, and performing quality assurance (QA), which may help overcome several adoption barriers faced by faculty, such as the lack of time, expertise, and resources.

However, limited research investigated IDs' role in the OER creation and application in postsecondary institutions (Merkel and Cohen 2015). Therefore, there is a need to explore what role IDs may play in creating and adopting open educational materials in higher education. The paper aims to investigate the role of IDs in promoting the OER movement and building partnerships with the faculty. The barriers of building collaborations between IDs and faculty will also be discussed. Furthermore, the paper will provide recommendations for future practices and ID preparation programs to promote the OER movement in higher education.

## 2 Literature review

Because the cost of attending institutions of higher education increased dramatically over the past few decades, many educators gradually realized the need to remove the financial barriers of higher education and to provide learners with equal learning opportunities. Many experts who devote themselves to advocating for open access believe that it is a human right to pursue education, which can potentially prevent knowledge inequality (Piña 2015). However, copyright laws, aiming to protect creators' intellectual property, to some extent, restrict freely reusing and disseminating a given work (Abramovich and McBride 2018; Crews 2012).

### 2.1 Expensive textbooks impact students' learning experiences

Some people may argue that the costs of textbooks and other learning materials are only a small portion of the total annual expenses for a student. However, these costs usually cannot be covered by financial aid in many higher education institutions (Peek

2012). Textbooks and course materials are expensive, which often has a crucial impact on students' learning experience, such as access and retention barriers.

In traditional classes, textbooks are generally viewed as authoritative resources for students to gain knowledge in specific subject areas (Hilton III et al. 2014; Richardson 2004). Sometimes, faculty require students to read a portion of each textbook. However, the limitation in remixing or redistributing textbook content need students buy multiple textbooks for one course (Ikahihifo et al. 2017). Some students may purchase or rent used books with outdated information. Some students reported that they may delay or do not purchase the required textbooks (Skinner and Howes 2013). Some of them even mentioned that they will take fewer courses (Abramovich and McBride 2018). About 23% of students reported that they did not register for the courses which require buying textbooks in a study conducted in U.S. higher education institutions (Okamoto 2013). As a result, students who cannot purchase the required version of the textbooks will not have equal access to the content as their peers do. These behaviors negatively influence their learning experiences and grades. Even worse, they may face challenges, such as academic performance gap and graduation delaying.

In order to overcome the barriers to access knowledge, there is a need to think about an alternative method to increase the inclusiveness and equalize learning opportunities within higher education. The idea of openness aims to increase public access to knowledge and promote learning involvement and engagement (Grewe and Davis 2017; Nikoi and Armellini 2012). It emerged as a potentially practical strategy to overcome barriers to access higher education (Murphy 2013; Nikoi and Armellini 2012; Piña and Moran 2018; Scanlon 2012).

## 2.2 Open educational resources (OER) and the OER movement

There is an agreement on the benefits of using open resources to pragmatically address the problems in higher education institutions, such as promoting the accessibility of higher education or removing retention barriers. However, the use of OERs has not been extensively accepted in many higher education institutions (Lindshield and Adhikari 2013; Nikoi and Armellini 2012). Too often, faculty and students face misunderstandings or misconceptions of openness, OERs, open practices, and the reusability of OERs, which may influence their application decisions and experiences (Chiappe and Arias 2015; Veletsianos 2015). Therefore, before discussing the OER movement and its adoption, there is a need to define these terms.

**Openness, open content, and open practices** The term “open” refers to the resources that are created, owned, or shared under the liberal licensing policies, or open content licensing. This kind of practice encourages the development and distribution of open content (Veletsianos 2015). For example, open educational resources (OER) is a broad term to include any open content materials in the public domain and with the permission to freely retain, reuse, revise, remix, and redistribute, (i.e., the 5R principles, Wiley 2014). Open educational content includes textbooks, course materials, software, videos, and other learning tools (Atkins et al. 2007; Abramovich and McBride 2018; Veletsianos 2015). They are often created and published in digital environments for the sake of distribution and reuse (Abramovich and McBride 2018). However, because of different situations and contexts, not all of the open content can be freely revised or

remixed, which often leads to misunderstandings when creating and adopting open content. Therefore, OERs contain two important components: one is free access, and the other is the permission to conduct 5R activities (Abramovich and McBride 2018; Wiley 2014).

The growth of open learning materials also leads to the development of open practices. Open practices often refer to the online actions which support the production of open content, such as open access advocacy, open teaching and learning, OER-based pedagogy, the reuse of OER, OER creation and sharing, learners as co-contributors of OERs, and open research projects (Nikoi and Armellini 2012; Veletsianos 2015). For example, many faculty members may choose social media, professional websites, and other online scholarly communities to share their research and scholarship. However, not all of these sharing activities can be viewed as open practices. Activities depend on the media that they use or specific licenses they use to accompany their shared content, such as open license or CC licensing (Abramovich and McBride 2018).

Meanwhile, faculty members have their preferences of participating in various open practices. For example, they may share their courses online, but not their course syllabi; or, they may publish their research articles on an open access platform, but not other materials, such as data collection instruments or presentation slides. Therefore, various approaches can promote the involvement in open practices, but performing open practices does not guarantee complete openness of education (Veletsianos 2015).

**OER repositories** Moreover, the platform to retrieve these open materials can be categorized as either big or little repositories (Merkel and Cohen 2015). Big repositories can be defined as institutional archives to save quality open educational materials, which are developed under professional guidance. Open materials in big repositories often contain full courses with pre-defined learning objectives. However, little repositories often refer to the archives, which hold open content created by individuals, and most of this open content lacks quality control and a systematic teaching plan. The little repositories include Wikipedia, YouTube, and personal blogs (Merkel and Cohen 2015). Because of lack of quality control, open materials in these little repositories often lead to a quality assessment concern.

**OER usage framework** According to the 5R principles, when open educational materials are created under the open content licensing, users have the permission to participate in various types of usage manners, including retain, reuse, revise, remix, and redistribute. The framework not only helps to identify whether the open content is produced under the CC licensing or open content licensing, but also plays an important role in indicating different OER usage behaviors (Wiley 2014). For example, the reuse principle allows faculty to use open educational materials without any change in their own classes, learning management systems, or their professional websites. The revise principle allows faculty to modify the content to accommodate their students' needs, such as language translation. The remix principle refers to a behavior that faculty integrate the open content into other materials to produce new instructional materials. The redistribute principle means that faculty is allowed to share the original or modified materials with their students or colleagues.

According to previous studies, the reuse is viewed as the basic level of the OER usage behavior and is the most popular behavior that user may perform when adopting open

educational materials. Although the revise and remix principles indicate the advanced usage levels, relating to actual utilization and implementation of OERs in different situations, limited users choose to take these actions. This may be caused by the difficulty in revising or remixing the materials by the users (Merkel and Cohen 2015). In order to increase two advanced usage levels, there is a need to provide more user-friendly materials which can be easily adapted and modified by the users. Therefore, according to the 5R framework, the accessibility and flexibility of OERs offer faculty autonomy to design their customized teaching materials (Ikahihifo et al. 2017).

**OER movement** The OER movement, or open content initiatives, aims to remove barriers of accessing knowledge, to provide high-quality and personalized open content, to maintain information-sharing communities, and promote collaborations (Atkins et al. 2007; Chiappe and Arias 2015; Veletsianos 2015). The movement influenced higher education worldwide, such as the Open Courseware Project sponsored by Massachusetts Institute of Technology (MIT), Open University established in the United Kingdom, open textbooks initiatives in the United States, multiple open content websites developed in Asian and European countries, OER projects in Africa, such as OER Africa, and national OER initiatives in multiple countries (Mulder 2013; Nikoi and Armellini 2012). Meanwhile, due to the promise of promoting the OER movement to support the access to knowledge and to enhance knowledge sharing, there is a possibility of building an inclusive learning environment, equalizing learning opportunities, and empowering the disadvantaged learners.

### 2.3 Perceptions of OER adoption

In order to effectively advocate the OER movement in higher education, it is necessary to understand the perceptions of major decision makers and target customers of the use of OERs. The paper will focus on what are students and faculty's perceptions of OERs. The answers may influence OER application and implementation in future teaching and learning activities (Belikov and Bodily 2016; Ikahihifo et al. 2017).

**Students** According to previous studies, students were more likely to express positive perceptions of using OERs and preferred the course with OER integration (Abramovich and McBride 2018; Ikahihifo et al. 2017; Merkel and Cohen 2015; Piña 2015). Some of students involved in an OER project at the University of Leicester even mentioned the benefits of OERs to remove access and use barriers (Nikoi and Armellini 2012). Similarly, in a survey study, 64% of the participants mentioned the advantageous features of OERs, including ease to use and access (Abramovich and McBride 2018). The findings of OER initiative projects indicated that students often felt satisfied with the low cost of adopting OERs and thought that the quality of OERs was often equal or higher than the traditional textbooks or other costly materials they used before (Abramovich and McBride 2018; Illowsky et al. 2016; Ikahihifo et al. 2017; Piña and Moran 2018). They were more likely to attend and recommend the course with OER integration compared to other traditional courses (Illowsky et al. 2016; Piña 2015; Piña and Moran 2018). Due to the variety, flexibility, and interactivity of OERs, some of students stated that these open

materials increased their engagement and supported their self-directed learning (Ikahihifo et al. 2017; Nikoi and Armellini 2012).

However, students also expressed their concerns and negative perspectives about the use of OERs. For example, in some OER projects in different universities, students mentioned that they would appreciate the procedures, such as quality control or quality assurance, to endorse the quality and sources of the open materials (Ikahihifo et al. 2017; Lindshield and Adhikari 2013; Nikoi and Armellini 2012). They proposed that these procedures may focus on aspects, such as content organization, clarity, and visualizations (Illowsky et al. 2016; Ikahihifo et al. 2017). Moreover, the majority of students preferred print materials or traditional textbooks to digital materials, which remained a challenge while adopting OERs in higher education (Abramovich and McBride 2018). Some of students mentioned their low comfort level of accessing and using digital technologies (Ikahihifo et al. 2017). Other students also expressed their concerns about issues, such as copyright and plagiarism (Nikoi and Armellini 2012).

**Faculty** According to previous studies, several factors, such as teaching experience, context, and the use of traditional textbooks, might influence instructors' perceptions of creating and adopting OERs in their classes (Thoms et al. 2018). Many instructors expressed their positive perceptions of adopting OERs for their teaching purposes, such as effectively helping students achieve their learning objectives (Abramovich and McBride 2018). Utilizing open educational materials and tools to lower their students' cost and to reduce learning barriers was main motivator for many instructors. In a survey study, 97% of the instructors who were from 11 different colleges found that OERs were valuable alternatives to traditional teaching materials (Abramovich and McBride 2018). Many instructors also appreciated the flexibility, autonomy, and customization of the open educational materials. For instance, instructors were allowed to revise and remix the content of OERs according to their students' needs and learning contexts (Ikahihifo et al. 2017; Piña and Moran 2018). Some of them believed that OERs were useful in improving the quality of their teaching when accessing to diverse teaching materials (Nikoi and Armellini 2012).

However, many faculty members often faced various challenges and difficulties when actually practicing OER adoption in their teaching. Because of these barriers, the OER movement in many higher education institutions was a slow process. For example, in the survey study, many instructors reported that although they had heard about OERs, they lacked expertise on OERs, CC licensing, or knowledge of creating and adopting OERs (Abramovich and McBride 2018). Some of instructors felt a sense of security when textbooks could guide them to plan their teaching components (Piña and Moran 2018). They were reluctant to give up using textbooks; otherwise, they had to take commitments to invest more time in preparation or completely redesign their courses. In addition, many postsecondary institutions lacked the needed resources and policies to support OER sharing or a motivation system to encourage instructors to get involved in the OER creation (Belikov and Bodily 2016; Lindshield and Adhikari 2013; Nikoi and Armellini 2012; Veletsianos 2015). Research also indicated that financial reward, recognition, and authorship were the top preferable incentives to change faculty's teaching approaches (Lindshield and Adhikari 2013; Nikoi and Armellini 2012). Other barriers include the lack of time, funding, technology support,

appropriate and comprehensive resources, staff support, and sustainability solutions, or access issues (Belikov and Bodily 2016; Lindshield and Adhikari 2013; Mulder 2013; Murphy 2013; Nikoi and Armellini 2012; Thoms et al. 2018; Taylor and Taylor 2018; Veletsianos 2015).

## 2.4 Benefits of OER initiatives

However, OER creation and adoption produce many advantages, including the benefits for students, faculty, and institutions. For example, the adoption of OERs can save students' educational costs, which allows them to take more courses within one semester or to complete their academic goals on time (Illowsky et al. 2016; Ikahihifo et al. 2017). In addition to economic benefits and equal learning opportunities, OER adoption provides other advantages for students (Belikov and Bodily 2016; Bliss et al. 2013; Ikahihifo et al. 2017; Piña 2015). Because of the flexibility and customization of OER, students often receive personalized learning experience. Implementing OERs also can potentially increase students' engagement and involvement, which allows them to be more prepared than using traditional textbooks (Bliss et al. 2013; Ikahihifo et al. 2017; Scanlon 2012). The use of OERs may potentially promote students' learning outcomes, or students can perform as the same as their peers who use traditional textbooks (Grewe and Davis 2017).

OER adoption also provides other benefits for faculty. For example, instructors are able to design their teaching materials based on their perspectives and their students' needs. They may accommodate their students' needs to achieve the pre-defined learning objectives (Taylor and Taylor 2018; Piña 2015). Instructors may need to spend more time on preparing their teaching materials while adopting OER. However, they can have the maximum autonomy of developing and updating their courses through relying on a variety of open multimedia resources (Taylor and Taylor 2018).

Moreover, due to the reusability and adaptability of OERs, OER adoption and creation can save money for the institutions (Abramovich and McBride 2018). To some extent, students prefer attending the institutions where OER initiatives are valued to traditional universities and colleges. Thus, administrators may view OER-based courses as assets to advertise their institutions. OER initiative projects may become an effective approach to decrease students' attendance costs, which increases institutional competitiveness to attract and retain students, such as enrollment and retention rates (Piña 2015; Piña and Moran 2018).

## 2.5 Possible solutions for barriers

Therefore, in terms of these benefits of OER adoption in higher education institutions, there is a need to come up with possible and feasible solutions to address these barriers to increase the use and creation of OERs. However, the success of the OER adoption and movement in higher education cannot solely rely on individual instructors' efforts. According to specific contexts, teamwork, including different resources, support services, and staff support, is highly needed (Nikoi and Armellini 2012). For example, higher education administrators, such as college deans, should show their support through changing their institutional policies accordingly (Nikoi and Armellini 2012;



Piña and Moran 2018). They may create a motivation system and provide faculty financial support to create and adopt OERs. Moreover, faculty can consider building partnerships with instructional designers/technologists or librarians to gain staff support (Nikoi and Armellini 2012; Okamoto 2013; Taylor and Taylor 2018). Faculty can think about developing online information-sharing communities where they can get peer support, share OER adoption experience, or design OER adoption templates (Carey et al. 2015; Taylor and Taylor 2018). Other approaches may include supporting open access textbooks (OATs), promoting digital inclusive programs, and developing networks and partnerships with other organizations and increasing external engagement (Carey et al. 2015; Okamoto 2013; Rodés et al. 2014).

## 2.6 OER creation and adoption practices

Individuals' efforts are not enough to successfully promote the OER movement. The support from administrators, staff, and other departments is necessary. Next, the paper will introduce several successful OER creation and adoption practices in higher education institutions.

**Faculty collaboration practices** First, in order to promote OER creation and adoption, collaborations among instructors are necessary. According to the open textbook initiatives conducted in Latin America, the LATIn Project, instructors collaborated with each other to create their customized books for their specific teaching contexts (Rodés et al. 2014). The strategies they used to adopt OERs included raising individual awareness, providing adoption, publication, and measurement support, and providing training to understand use, creation, and reusability aspects of OER. The researchers further believed that the success of the open textbook initiatives depends on the collaboration between internal and external organizations.

**Partnerships with libraries** University libraries often play a crucial role in supporting open access, online publishing, and OER initiatives in higher education (Okamoto 2013). Libraries are places to value the promise of providing ordinary people the knowledge access for the sake of public benefits and equal learning opportunities (Wiley 2014). Academic libraries have the responsibility of readdressing the issue and democratizing students' learning opportunities in higher education.

In order to handle the increase of textbook costs, it is common to see inappropriate or illegal behaviors among students, such as pirating (Okamoto 2013). Many university libraries advocated and facilitated OER initiatives through conducting open access textbooks (OATs) projects, establishing open course repositories, and other activities (Miller and Homol 2016; Okamoto 2013). Library staff is capable of providing services and support to assist instructors in locating, evaluating, collecting, maintaining, and accessing open scholarship as well as creating and curating open educational materials (Miller and Homol 2016; Okamoto 2013; Piña and Moran 2018; Veletsianos 2015). Therefore, university libraries play a role in classifying, preserving, and disseminating open resources and will gradually participate in OER creation and curation practices. However, it is important to notice that library staff face other problems as well, such as time and technology concerns and difficulty in collaborating with faculty (Okamoto 2013).

**Partnerships with administrators** University administrators can also play a supportive role in assisting faculty to overcome difficulties when integrating OERs into their classes. For example, higher education administrators can value open practices through highlighting the action as part of their campus culture or changing institution policies (Nikoi and Armellini 2012). For instance, college deans should feel positive about the use of OERs and the benefits of OER-based courses, and they can further encourage and approve OER-related projects or programs (Piña and Moran 2018). Administrators can also build an effective motivation system to provide additional compensations or recognitions for faculty who are actively engaged in OER creation and adoption (Nikoi and Armellini 2012). These institutions may also consider decreasing faculty workload, such as teaching and advising responsibilities. Administrators can communicate with the various departments and offices to promote effective partnerships and collaborations among faculty, librarians, and IDs, to produce OER, share their OER adoption experiences, and receive peer-evaluation feedback. Higher education administrators can invite a subject matter expert who is specialized in OER to provide professional development workshops for faculty and staff on related topics, including OER research, evaluation, copyright issues, fair use, and quality assurance.

## 2.7 What IDs can do in higher education?

In higher education, IDs are professionals who have expertise and experience in instructional technology and curriculum development. They often work with faculty to design and develop instructional materials based on appropriate learning and teaching theories (Kumar and Ritzhaupt 2017; McGriff 2001; Morrison et al. 2010).

**Learner and environment analysts** While developing the curriculum, IDs are responsible for understanding the teaching problems, learning environment, and learners' needs (Kumar and Ritzhaupt 2017). They are also responsible for ensuring that the learners have access to learning materials. When many learners choose not to buy the textbooks, or the textbook content is too outdated to achieve learning objectives, IDs may consider integrating alternative learning materials to equalize the learners' learning opportunities and design learning materials with updated knowledge to enhance their learning outcomes.

**Instructional innovators** In terms of the constant change in the field of educational technology, IDs often serve as instructional innovators in solving teaching problems. According to Norman (2013), designers are often proud of coming up with creative solutions. Similarly, IDs are more likely to become early adopters of new educational technologies and evaluate the usability of innovative resources (Merkel and Cohen 2015). Therefore, it is reasonable to view IDs as a crucial agent during the cultural change and technology innovation to engage learners in higher education institutions (McGriff 2001). In this way, they are expected to hold a role in empowering students' learning experience when OER creation and adoption are necessary.

**Leaders in instructional technology** Additionally, IDs often serve as leaders in technology integration and curriculum innovation, with a support to achieve faculty

development in higher education institutions (McGriff 2001). Because of the constant change in learners' characteristics, technologies, and learning environment, there is a need to equip faculty with sufficient knowledge about how to deal with these changes in their teaching practices. IDs in faculty development can provide instructors with technology support and life-long learning opportunities. IDs can encourage faculty to understand how to integrate innovative learning theories, pedagogies, and technologies to address various changes in a learning environment.

**Collaboration barriers and problems** However, in addition to the lack of involvement in the OER movement, the role of IDs is often underemphasized or ignored in developing courses in many colleges and universities. For instance, Inside Higher Ed and Gallup conducted a 2018 Survey of Faculty Attitudes on Technology, and more than 2000 faculty members responded the survey (Lederman 2018a). The findings showed that only 25% of the respondents mentioned that they have worked with IDs when designing their courses. About 30% of the participants reported that their institutions did not inform them of the availability of IDs. About 25% of the participants mentioned that they did not know what IDs can do to improve their courses (Lederman 2018a).

Besides, IDs often face other challenges when collaborating with faculty, especially the difference between viewing faculty as subject matter experts or as clients (Gérin-Lajoie 2015; Kumar and Ritzhaupt 2017). For instance, many IDs mention that they often negotiate with faculty about creating measurable learning objectives and designing appropriate assessments to measure these objectives. Faculty, as SMEs, often lack the knowledge of multimedia learning, and a majority of learning materials they produced are text-based. Under this situation, instead of viewing IDs as experts in course design and development, IDs often invest more time in applying multimedia learning principles to edit these text-based course materials. Due to these collaboration problems caused by faculty misconceptions, unsurprisingly, one seldom sees IDs' figure in the OER movement and how they build the partnerships with faculty members to promote OER creation and adoption in postsecondary institutions (Merkel and Cohen 2015). Therefore, creating campus culture to support and encourage the collaborations between IDs and faculty is needed.

## 2.8 IDs in the OER movement

Faculty often face a challenge, which is lack of high quality OERs to reuse in their specific contexts. OER creation is often costly and time-consuming, which highlights the necessity of providing quality pedagogical open content to support the reusability and sustainability of OER (Arimoto et al. 2016). IDs are skilled professionals who master various learning theories, pedagogies, and technology integration. They can serve as an important agent to provide support in deciding theoretical foundations and practical strategies when developing OER-based classes in higher education (McGriff 2001). For example, in terms of 5R principles, IDs may contribute to various usage levels, such as revise and remix levels, when adopting OERs in various subjects and contexts. They may modify the open materials or mix the OER content with other materials to produce appropriate learning materials to accommodate learners' needs and

achieve learning objectives. Therefore, it is reasonable to include IDs as part of workforce while promoting the OER movement to transform higher education.

**Collaboration in the OER initiatives** It is common to see the disagreement between two parts. According to the responses from the IDs who were involved in an OER initiative in Sullivan University, the OER adoption project improved the faculty-to-IDs relationship and the quality of courses. For example, one of IDs mentioned that without using a textbook, they could start developing a course from identifying the required learning outcomes and then locating resources to achieve these outcomes, which may eliminate their disagreements on whether the content or assessments are conformed with the learning objectives (Piña and Moran 2018). The idea of adapting OERs to achieve learning objectives is also aligned with the perceptions of students on intentionally selecting OERs to aim at their assignment (Abramovich and McBride 2018; Ikahihifo et al. 2017). Through effective collaborations, OER-based courses may contain higher quality content, clearer organization, and better multimedia learning experience, comparing to the course designed by faculty alone. Therefore, the OER initiatives may provide a benign environment to increase collaborations where faculty may serve as SMEs to focus on the content and IDs can assist faculty in better adapting and developing OER-based teaching activities.

### 3 Implications for future practices

After understanding the potential role that IDs play in promoting the OER movement in higher education, there is a need to address two questions. First, how to emphasize the role of IDs or popularize the collaborative practices in the future OER movement? Second, what knowledge and skills should be provided in the ID preparation programs?

#### 3.1 Future OER creation and adoption

OERs can be beneficial in many aspects, including individual, institutional, and national levels. According to previous studies, students and faculty often expressed their positive perceptions of adopting and using OERs in their classes. In terms of many benefits of OERs, there is a need to encourage the OER initiatives in higher education. However, faculty, as major curriculum decision makers, often face many barriers when participating in OER creation and adoption. The success of the OER movement cannot be achieved by exclusively relying on individual efforts. Thus, there is a need to value the importance of collaborative practices in the future OER adoption and creation activities. In order to support the OER creation and adoption, one of viable solutions is to include IDs in the OER projects.

Several strategies and procedures will be introduced to popularize the involvement of IDs in the OER movement in higher education institutions. First, higher education administrators should advocate adopting OERs and developing OER-based programs. Administrators, such as college deans, should be positive to view OERs as reliable learning resources and update their college policies and guidelines to develop a system to support individual faculty and team to adopt OERs. For example, college deans may

approve the courses with OER adoption and provide incentives to encourage academic adjustments among faculty members. They may also advertise the benefits of OERs among students to change their misconceptions and increase their acceptance (Ikahihifo et al. 2017).

Meanwhile, it is important for administrators to build the awareness of the role of IDs in designing and developing courses. In the survey study, about 75% of faculty in postsecondary institutions reported that they have not worked with an instructional designer to deliver their courses (Lederman 2018b). This may be caused by the lack of awareness of the resources in developing curriculum and technology integration. Faculty are SMEs, but they may not expert in curriculum development or technology integration. Thus, administrators need to consider changing campus culture to value the role of IDs in instructional development and improving academic performance. For instance, administrators may provide information about what IDs can do and collaboration opportunities, such as their expertise in learner analysis, instructional design, and technology integration, and how to work with IDs, including their office addresses and contact information. They can regularly hold social events to encourage faculty and IDs to improve their communications to build effective partnerships. Through mutual understanding, instead of viewing IDs as copy-editors, faculty may reconsider IDs as valuable consultants in improving the quality of their courses. As a result, a benign campus culture can promote the collaborations to provide students with quality learning experiences.

Furthermore, administrators may highlight the expertise of IDs in supporting the OER movement in higher education. For example, faculty selected most of the open content from little repositories. These open resources may lack quality control or a systematic teaching plan, such as terminology definitions from Wikipedia and instructional videos from YouTube (Illowsky et al. 2016). In this case, IDs can contribute their knowledge to assist faculty in better integrating OERs to align with learning objectives and conducting QA to ensure the quality of materials. Because of the flexibility of OERs, faculty, sometimes, may update or adapt them according to their different purposes and contexts. IDs have expertise on copyright issues, and they can help faculty conduct 5R activities to transform the existing OERs in appropriate ways.

Moreover, according to a study in a community college, 74.2% of the students believed that open textbook is more engaging than traditional textbooks (Ikahihifo et al. 2017). The researchers further mentioned that OER adoption alone may not increase engagement, and engagement may be affected by instructional design strategies, such as content organization. Learners' perceptions of OERs may also be changed by effective instructional strategies (Illowsky et al. 2016). Thus, the integration of OERs for the sake of OERs does not guarantee the effectiveness of accessing and learning, which highlights the role of instructional design in maximizing the benefits of OERs. IDs may work with faculty to better understand the right problems before identifying and adopting appropriate OERs. Then, they may help faculty locate high-quality OERs to align with learning objectives and apply effective strategies to increase learners' engagement. For instance, IDs have expertise on visual literacy and multimedia learning theories, and they may help faculty improve many aspects of instructional materials, such as content structure, clarity, visualizations, and multimedia integration. Furthermore, to accommodate the needs of students who prefer print materials to digital ones, IDs may provide them with an option to print out these materials and include

other possible technologies to maximize the accessibility and usability of OERs, such as a screen reader.

In addition, the sustainability of OERs is an important concept to optimize the resources. In order to maximize the use and reusability of OERs, it is necessary to include quality standards and QA models in institutional policies (Nikoi and Armellini 2012). In this case, each OER-based course has to meet the quality standards and QA models before being launched. Under this situation, IDs may serve as consultants or co-contributors while developing OER-based courses to align with the quality standards, evaluators to assess the quality of these courses based on the QA models, and professionals to provide further support to sustain the reusability of OERs. Administrators may also consider building a motivation system to reward and recognize the IDs who put their efforts to increase the sustainability of OER-based materials and programs.

All in all, for the sake of providing equal learning opportunities and producing engaging learning experiences to students, the role of IDs in promoting OER adoption and creation should not be underestimated. Effective collaborations between faculty and IDs may promote high-quality OER-based courses and the transformation of higher education (Lederman 2018a, b; Piña 2015).

### 3.2 ID preparation programs

Because of the potential role that IDs will play in promoting the OER movement, there is a need to consider how to equip future IDs with sufficient knowledge and skills to deal with the future OER creation and adoption. First, the program may consider providing courses with needed knowledge and resources to support OER creation and adoption. For example, the preparation program may offer a course which specifically highlights the information about copyright issues, fair use, open content licensing, and CC licensing. The program may also provide workshops about how to effectively locate, evaluate, and integrate open educational materials and tools. Faculty in the program may also consider offering project-based courses to address the 5R principles of usage. For example, the course can introduce how to use open source software and tools to revise and remix open educational materials based on real-world scenarios and different learning contexts (Kumar and Ritzhaupt 2017; Slagter van Tryon et al. 2018).

Second, the program may provide courses to address collaboration and communication competencies (Kumar and Ritzhaupt 2017). IDs often play a supportive role in working with faculty to design and improve teaching materials to achieve the learning objectives. Thus, there is a need to provide related courses to develop future IDs' soft skills, such as communication and collaboration skills. They can know about how to effectively collaborate with faculty and other departments to promote the OER movement in higher education institutions.

Moreover, the program may consider offering courses about leadership and advocacy. IDs often serve in a leadership role in faculty development or instructional innovation. There is a need to provide courses about leadership in instructional technology. The future instructional designers can better work with faculty on technology integration and determine instructional innovation to maintain faculty development and the transformation of higher education (McGriff 2001).

Finally, future IDs can take courses outside of their program. There is a need to equip future IDs with sufficient knowledge about the cultural or political phenomenon in higher education, such as the diversity of student populations. In this way, they may better understand the learners and design effective courses and course materials to address their needs. For example, in order to provide accessible learning experience to learners, in addition to reusing open educational materials, IDs may consider implementing Universal Design for Learning (UDL) principles to accommodate the various needs of learners (Elias 2010).

#### **4 Limitations and recommendations for future research**

The paper mentions that the success of the OER movement cannot be achieved through relying on individual efforts. There is a need to build partnerships and collaborative communities to promote creating and adopting open educational materials in higher education. However, the paper only focuses on the role that IDs may play in OER creation and adoption. The findings may apply to specific contexts, and the proposed strategies cannot be generalized to every institution or context.

If the collaborations between IDs and instructors could be widely accepted in higher education, researchers could conduct studies to investigate the effectiveness of their collaborations in promoting the OER movement. Future OER initiatives and projects may benefit from the findings from multiple collaborative cases in various institutions. Future research may further explore the role of other departments and entities, such as administrators, student affairs, students, and librarians. Implications for student affairs and librarian preparation programs need to be discussed. Researchers may also investigate the effectiveness of other strategies to increase OER adoption and creation, such as financial rewards, recognition, and authorship. Each institution has its unique context, and not every institution has sufficient support. Future studies may discuss the opportunities and challenges of building partnerships between faculty and students or viewing students as contributors of OERs to promote the OER movement in higher education institutions. Future research may also consider exploring the best practices of building collaboration between IDs and library staff or student affairs. Further research may investigate the impact of OER collaborations on student learning outcomes.

#### **5 Conclusion**

In conclusion, in order to sustain the mission of higher education, there is a need for faculty and staff to constantly reflect on their current teaching strategies and institution policy. The increase of textbook costs produces barriers for many students to access knowledge. In order to democratize and equalize the learning opportunities, considering applying alternative approaches, open educational resources, to overcome the disadvantages of utilizing textbooks in higher education is necessary.

Although faculty are mainly in charge of delivering courses, the success of the OER movement in higher education cannot exclusively rely on their efforts. The findings of the paper aim to raise the awareness of the importance of collaborations in advocating OER creation and adoption in higher education institutions. Different departments,

offices, and entities need to play interdependent roles in creating and adopting OER. For example, administrators may change the institution policy to motivate faculty and other staff to actively get involved in the OER movement. Faculty and administrators may better understand the potentials of IDs in promoting the OER movement. Librarians may advocate open initiatives and open access textbook projects.

Although IDs have expertise in curriculum development and instructional innovation, they often are ignored or underestimated in producing OER-based courses. It is instrumental to think about what IDs can do to promote OER creation and adoption in higher education. However, administrators need to put their priority to include IDs in the future OER projects and build faculty's awareness of the collaboration opportunity with IDs. Faculty may reconsider and appreciate the expertise of IDs and their collaborative practices while designing the courses with OER adoption. For instance, building collaboration with IDs may potentially help faculty overcome OER adoption barriers, including the lack of knowledge about copyright laws, CC licensing, and open practices, the lack of technology and staff support, or the lack of background in instructional design and technology integration. IDs can potentially work with faculty in locating, revising, or remixing open materials according to specific learning contexts.

OER is not the only approach to solve students' financial burden, but it seems the most feasible and effective method to decrease their additional expenses. It is beneficial to encourage open practices to promote the inclusiveness and accessibility of higher education. However, there is no perfect model to promote the OER movement, and the success of the OER movement needs to rely on everyone's efforts and contributions. Different higher education institutions need to consider appropriate strategies according to their specific contexts, including available resources, staff, students, funding, and other support. For instance, some institutions may not have staff positions, such as IDs or educational technologists, or they may have other staff to perform similar job. All in all, OER has a potential of transforming higher education with a promise of providing both quality and affordable learning opportunities (Lederman 2018a). The findings will contribute to the growing body of knowledge in the field of OER initiatives and lay the foundations for the future research.

## Compliance with ethical standards

**Conflict of interest** The author declares that she has no conflict of interest.

**Ethical approval** This article does not contain any studies with human participants or animals performed by any of the authors.

## References

- Abramovich, S., & McBride, M. (2018). Open education resources and perceptions of financial value. *The Internet and Higher Education*, 39, 33–38.
- Arimoto, M. M., Barroca, L., & Barbosa, E. F. (2016). Am-OER: An agile method for the development of open educational resources. *Informatics in Education*, 15(2), 205–233.
- Atkins, D. E., Brown, J. S., & Hammond, A. L. (2007). *A review of the open educational resources (OER) movement: Achievements, challenges, and new opportunities*. San Francisco, CA: The William and Flora Hewlett Foundation.



- Belikov, O. M., & Bodily, R. (2016). Incentives and barriers to OER adoption: A qualitative analysis of faculty perceptions. *Open Praxis*, 8(3), 235–246.
- Bliss, T., Robinson, T. J., Hilton, J., & Wiley, D. A. (2013). An OER COUP: College teacher and student perceptions of open educational resources. *Journal of Interactive Media in Education*, (1), 1–25.
- Carey, T., Davis, A., Ferreras, S., & Porter, D. (2015). Using open educational practices to support institutional strategic excellence in teaching, learning & scholarship. *Open Praxis*, 7(2), 161–171.
- Chiappe, A., & Arias, V. (2015). Understanding reusability as a key factor for open education: A review. *The International Review of Research in Open and Distributed Learning*, 16(1), 40–56.
- Crews, K. D. (2012). Copyright, archives, and unpublished materials. *Copyright law for librarians and educators: Creative strategies and practical solutions* (pp. 131–138). Chicago, IL: American Library Association.
- Elias, T. (2010). Universal instructional design principles for Moodle. *The International Review of Research in Open and Distributed Learning*, 11(2), 110–124.
- Flores, S. M., & Shepherd, J. C. (2014). Pricing out the disadvantaged? The effect of tuition deregulation in Texas public four-year institutions. *The Annals of the American Academy of Political and Social Science*, 655, 99–122.
- Gérin-Lajoie, S. (2015). Being an instructional designer: A job requiring innovation and trust. *Canadian Journal of Learning and Technology*, 41(4). Retrieved Oct 16, 2018, from <https://files.eric.ed.gov/fulltext/EJ1083480.pdf>.
- Grew, K., & Davis, W. P. (2017). The impact of enrollment in an OER course on student learning outcomes. *The International Review of Research in Open and Distributed Learning*, 18(4), 231–238.
- Hemelt, S. W., & Marcotte, D. E. (2011). The impact of tuition increases on enrollment at public colleges and universities. *Educational Evaluation and Policy Analysis*, 33(4), 435–457.
- Hilton, J. L., III, Robinson, T. J., Wiley, D., & Ackerman, J. D. (2014). Cost-savings achieved in two semesters through the adoption of open educational resources. *The International Review of Research in Open and Distributed Learning*, 15(2), 67–84.
- Ikahihifo, T. K., Spring, K. J., Rosecrans, J., & Watson, J. (2017). Assessing the savings from open educational resources on student academic goals. *International Review of Research in Open and Distance Learning*, 18(7), 126–140.
- Illowsky, B. S., Hilton, J., Whiting, J., & Ackerman, J. D. (2016). Examining student perception of an open statistics book. *Open Praxis*, 8(3), 265–276.
- Kerkvliet, J., & Nowell, C. (2014). Public subsidies, tuition, and public universities' choices of undergraduate acceptance and retention rates in the USA. *Education Economics*, 22(6), 652–666.
- Kumar, S., & Ritzhaupt, A. (2017). What do instructional designers in higher education really do? *International Journal on E-Learning*, 16(4), 371–393.
- Lederman, D. (2018a). Conflicted views of technology: A survey of faculty attitudes. *Inside Higher Eds*. Retrieved November 12, 2018, from <https://www.insidehighered.com/surveys>.
- Lederman, D. (2018b). Professor, please meet your instructional designer. *Inside Higher Eds*. Retrieved November 12, 2018, from <https://www.insidehighered.com/surveys>.
- Lindshield, B., & Adhikari, K. (2013). Campus and online U.S. college students' attitudes toward an open educational resource course fee: A pilot study. *International Journal of Higher Education*, 2(4), 42–51.
- McGriff, S. J. (2001). Leadership in higher education: Instructional designers in faculty development programs. Retrieved October 16, 2018, from <https://files.eric.ed.gov/fulltext/ED470160.pdf>.
- Merkel, E., & Cohen, A. (2015). OER usage by instructional designers and training managers in corporations. *Interdisciplinary Journal of E-Skills and Lifelong Learning*, 11, 237–256.
- Miller, R., & Homol, L. (2016). Building an online curriculum based on OERs: The library's role. *Journal of Library & Information Services in Distance Learning*, 10(3–4), 349–359.
- Morrison, G. R., Ross, S. M., Kemp, J. E., & Kalman, H. (2010). *Designing effective instruction*. Hoboken, NJ: Wiley.
- Mulder, F. (2013). The logic of national policies and strategies for open educational resources. *The International Review of Research in Open and Distributed Learning*, 14(2), 96–105.
- Murphy, A. (2013). Open educational practices in higher education: Institutional adoption and challenges. *Distance Education*, 34(2), 201–217.
- National Center for Education Statistics. (2018). Tuition costs of colleges and universities. Retrieved October 2, 2018, from <https://nces.ed.gov/fastfacts/display.asp?id=76>.
- Nguyen, N. A. (2010). Not all textbooks are created equal: Copyright, fair use, and open access in the Open College Textbook Act of 2010. *Journal of Art, Technology & Intellectual Property Law*, 21(1), 105–130.
- Nikoi, S., & Armellini, A. (2012). The OER mix in higher education: Purpose, process, product, and policy. *Distance Education*, 33(2), 165–184.

- Norman, D. A. (2013). *The design of everyday things*. New York, NY: Basic Books.
- Okamoto, K. (2013). Making higher education more affordable, one course reading at a time: Academic libraries as key advocates for open access textbooks and educational resources. *Public Services Quarterly*, 9(4), 267–283.
- Peek, R. (2012). Textbooks in turmoil. *Information Today*, 29(5), 26.
- Piña, A. A. (2015). Open content licensing. In J. M. Spector (Ed.), *The SAGE encyclopedia of educational technology*. Thousand Oaks, CA: Sage Publications, Inc.
- Piña, A. A., & Moran, K. A. (2018). Effects of an open educational resources initiative on students, faculty and instructional designers. *Online Journal of Distance Learning Administration*, 21(2). Retrieved October 2, 2018, from [https://www.westga.edu/~distance/ojdla/summer212/pina\\_moran212.html](https://www.westga.edu/~distance/ojdla/summer212/pina_moran212.html).
- Richardson, P. W. (2004). Reading and writing from textbooks in higher education: A case study from economics. *Studies in Higher Education*, 29(4), 505–521.
- Rodés, V., Podetti, M., Hernández, Y., & Collazos, C. (2014). Strategies for the adoption of open textbooks: The Latin American open textbooks initiative. *European Journal of Open, Distance and E-Learning*, 17(2), 76–85.
- Scanlon, E. (2012). Open educational resources in support of science learning: Tools for inquiry and observation. *Distance Education*, 33(2), 221–236.
- Skinner, D., & Howes, B. (2013). The required textbook—Friend or foe? Dealing with the dilemma. *Journal of College Teaching & Learning*, 10(2), 133–142.
- Slagter van Tryon, P. J., McDonald, J., & Hirumi, A. (2018). Preparing the next generation of instructional designers: A cross-institution faculty collaboration. *Journal of Computing in Higher Education*, 30, 125–153.
- Taylor, C., & Taylor, M. W. (2018). I'm never doing this again: Identifying and solving faculty challenges in adoption of open educational resources. *Online Journal of Distance Learning Administration*, 21(2), 1–8.
- Thoms, J. J., Arshavskaya, E., & Poole, F. J. (2018). Open educational resources and ESL education: Insights from U.S. educators. *The Electronic Journal for English as a Second Language*, 22(2), 1–24.
- United States Department of Labor. (2018). College textbooks in U.S. city average, all urban consumers, not seasonally adjusted. Retrieved October 2, 2018, from <https://beta.bls.gov/dataViewer/view/timeseries/CUUR0000SSEA011>.
- Veletsianos, G. (2015). A case study of scholars' open and sharing practices. *Open Praxis*, 7(3), 199–209.
- Wiley, D. (2014). The access compromise and the 5th R. *Iterating toward Openness*. Retrieved October 3, 2018, from <https://opencontent.org/blog/archives/3221>.

**Publisher's note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.