Open is an Invitation: Exploring Use of Open Educational Resources with

Ontario Post-Secondary Educators

by

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A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
Doctor of Education

Approved October 2018 by the
Graduate Supervisory Committee

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ARIZONA STATE UNIVERSITY

December 2018

ABSTRACT

During the 2017-2018 academic year, I worked as Program Manager for a government-funded post-secondary organization in Ontario, Canada. A core part of my professional role was creating awareness and increasing the use of open educational resources (OER) in partnership with Ontario educators. I conducted this work with the support of colleagues and OER advocates at public colleges and universities. Collectively, we focused on the use of OER as an opportunity to: (a) reduce the cost of post-secondary resources, (b) diversify the types of resources used in teaching and learning, and (c) explore opportunities to create assessments and activities that empowered learners as co-creators of knowledge. Alongside my professional role during this year, I engaged in a mixed-methods action research study using change management strategies and Ajzen's (1991) Theory of Planned Behavior. The purpose of the study was to determine the usefulness of an awareness and support strategy designed to increase the use of OER among post-secondary educators in Ontario.

For many of the participants in the study ($n = 38$), OER were new elements in their teaching practice. I engaged in focused and meaningful dialogue with them as part of professional development sessions in order to fully explore their perspectives about use of OER. I chose two facilitation designs as the action of my action research. The first was a pair of face-to-face workshops, and the second was an open online course commonly called a MOOC (massive open online course). These were the interventions (and innovations) for the study. From the perspective of the participants, the awareness and support strategies were determined to be useful for increasing their use of OER.

I dedicate this work to the wonderful people in my life who sacrificed the most to help

me achieve it. These people are my amazing young adult sons, Alex and Nick, and my

kind, loving, and supportive husband Terry.

French, Terry Greene, and Joanne Kehoe—for keeping me laughing (and sane) while I learned to balance life, this dissertation, and work.

I want to acknowledge and thank the people of the global open movement that I have come to know through their research and through virtual and face-to-face encounters. They are my inspiration. From every nation, representing every role you can imagine, at every life stage, people who believe in open education and education for all are my guiding light for the work that I hope to accomplish. I look forward to learning with and from them every day.

Among global open educators, I specifically want to thank the members of the Global OER Graduate Network (GO-GN) for inviting me to join their ranks. GO-GN is a community of doctoral students from around the world working on research studies related to openness. They are warm, generous, supportive peers–so smart, so loving. I thank my beautiful friend Judith Pete the most. Her personal and professional work and research in Nairobi, Kenya is profoundly inspiring. Many thanks to the GO-GN research leaders during my time as a student, Bea de los Arcos, Natalie Eggleston, Rob Farrow, Beck Pitt, and Martin Weller.

Finally, I thank my sister, Tia Morrison. She is a dedicated lawyer and advocate for women, and I'm deeply proud to be a first generation graduate alongside her.

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CHAPTER 1

Introduction and Purpose of the Study

As a learning design practitioner and post-secondary education program

manager, I have identified a problem of practice as follows: The use of open educational

resources (OER) is not widespread among Ontario college and university educators. OER

are defined as no-cost, openly licensed materials that may be adapted and used by anyone

for learning (UNESCO, n.d.). Use of OER, including open textbooks, represents a

relatively new global opportunity to explore the creation of no-cost, adaptable teaching

resources. Research in this new field of practice provides an opportunity to examine ways

that open resources might reduce the cost of post-secondary education in local contexts.

Awareness of the potential benefits of OER is emerging slowly, but steadily. Early OER

adopters are experimenting with a variety of resources, and there is growing research on

the effectiveness of OER for post-secondary teaching and learning. In order to increase

awareness of the value of OER among learners, educators, and institutions, global

researchers suggest several strategies. These include OER awareness and communication

campaigns, the provision of professional development for educators and learners, and

support for course redevelopment with time release or funding (Lund Goodwin, 2011).

Open textbooks, a growing category of OER, may represent a familiar resource

type for educators, and may help to reduce the overall cost of education for learners

(Weller, 2014). Although cost saving is a common focus in conversations about OER, the

literature indicates that this alone may not create sufficient motivation for educators and

institutions to engage in the work of change (Open e-Learning Content Observatory

Services (OLCOS), 2012). The predominant model of post-secondary education in North

America places the cost of textbooks and other course resources on learners and their families. It is a well-established practice that both learners and educators expect, so there may be little institutional or educator motivation to change this model in Ontario (Senack, 2015).

In addition to reducing costs for learners, drivers for post-secondary shifts to OER may include the capacity to localize and contextualize course resources (Weller, de los Arcos, Farrow, Pitt, & McAndrew, 2015) and the opportunity to differentiate an institution as more affordable (and therefore more accessible) (Griffiths, Mislevy, Wang, Shear, Mitchell, Bloom, Staisloff, & Desrochers, 2017). In addition, governments may want to consider the overall cost of post-secondary education for learners and their families. Governments are often a source of post-secondary education funding in the form of grants and student loans. Given this substantial investment of public funds, they may wish to see course resource costs reduced (Ontario Ministry of Training, Colleges and Universities, 2017). Whatever the driver for change, systemic change typically requires a multi-layered, facilitated approach as follows: recognition of an individual employee's desire for change (or lack of desire for change), consultation processes, collaborative dialogue among stakeholders, evidence-based change management strategies, and support for new practices (Kezar, 2013; Rogers, 2003).

Use of OER and open textbooks for post-secondary education are still relatively unknown options in Ontario (The National Survey of Online and Distance Education in Canadian Post-Secondary Education, 2017) and indeed internationally. The global OER movement gained momentum around 2001 with the launch of MIT's (Massachusetts Institution of Technology) OpenCourseWare initiative, followed by UNESCO's First

Global OER Forum in 2002. Over the past 15 years of OER advocacy, growth and research have been slow (Weller, 2014). However, in Canada, awareness of OER has recently accelerated due to significant investment from the government of the province of British Columbia. BCcampus, a province-wide education technology exploration organization funded by the provincial government, launched its Open Textbook initiative in 2012. The funding focus was on adaptation, creation, and increased use of open textbooks. The success of this ongoing project was measured in terms of learner savings on textbook costs. BCcampus provided support (in terms of funding and professional development for educators) for creating Canadian editions of post-secondary level introductory open textbooks in subjects as varied as biology, chemistry, psychology, sociology, and more (BCcampus, n.d.). This initiative generated curiosity and a desire in other provinces in Canada to implement similar approaches to expand the use of open textbooks.

Early literature on the use of open textbooks and OER indicates that awareness and use in post-secondary education leads to costs savings for learners (Fischer, Hilton III, Robinson, & Wiley, 2015; Jhangiani, Pitt, Hendricks, Key, & Lalonde, 2016). Evidence also shows that use of OER may lead to more innovative teaching and learning methods and improve learner outcomes (Butcher & Hoosen, 2012; Colvard, Watson, & Park, 2018; Ehlers, 2011 A number of pedagogic possibilities emerge when using OER compared to more traditional, proprietary publisher resources. For example, open resources are available in openly editable formats so that they can be downloaded, printed, adapted, remixed, revised, and shared without copyright permissions. Educators are empowered with OER to adapt resources to their local contexts and can easily ensure

that resources are rendered accessible for learners with differing physical or cognitive needs. Through use of OER, learners might also be empowered as resource curators and co-creators of knowledge, focusing on practice with discernment (judging accuracy and quality of resources), curation (finding and sharing resources for their own learning or the learning of peers), and co-creation of resources through experiential projects. Presenting the case for using OER for the purpose of cost savings (for learners and governments), combined with opportunities for pedagogic innovation and improved learner success, may represent effective levers for increasing use.

Use of OER is an Internet-enabled opportunity and therefore represents an innovation for many educators (Perkins, 2011; Weller, 2014). As with many innovations, the potential benefits might not be fully realized until a sufficient number of primary users believe there is an advantage in the new paradigm and take action to change their practice (Rogers, 2003; Zhu & Engels, 2014). In order to reach a tipping point with a new practice (where a larger group of users undertake the new paradigm), users must be provided with support and opportunities to experiment to help ensure a successful innovation. Change for any group of practitioners is a challenging process that requires communication, openness to new processes, personal learning, collective dialogue among users, and adequate support (Kezar, 2013). From a change management perspective, practitioners often have competing priorities for their time and attention where any new practice is concerned. Keeping these change management challenges in mind, the desire to increase use of OER in Ontario would require effective communication and support strategies to address educator-identified concerns.

Global and National Context of the Study

My place of work, eCampusOntario, is part of a network of North American and global education organizations with practitioners who connect and collaborate. Many governments, colleges, and universities around the world are pursuing policy and sharing practice in open education (Hylén, Van Damme, Mulder, & D'Antoni, 2012). Awareness of OER and open textbooks is increasing worldwide. There are high-profile, global initiatives advocating the use of OER as one option to help achieve equitable access for learners, as part of the larger aim of education for all. One of these is the United Nations Educational Scientific and Cultural Organization (UNESCO) OER movement. UNESCO has been promoting research, development, and use of OER since the First Global OER Forum in 2002. UNESCO's OER initiative is related to their *Education 2030 Incheon Declaration and Framework for Action*. The following quote from this declaration describes UNESCO's vision for global success:

> Our vision is to transform lives through education, recognizing the important role of education as a main driver of development and in achieving the other proposed SDGs. We commit with a sense of urgency to a single, renewed education agenda that is holistic, ambitious and aspirational, leaving no one behind. This new vision is fully captured by the proposed SDG [Sustainable Development Goal] 4 *'Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all'* and its corresponding targets (UNESCO, 2015).

Improved access to information through the Internet is enhancing global capacity to create and share OER. This paradigm shift is bringing UNESCO much closer to the realization of its Education 2030 goals.

There are numerous examples of the impact and value that governments and foundations place on the development and sharing of OER. In 2001, the Massachusetts Institute of Technology (MIT) became the first major educational organization to openly share its course materials globally (MITOpenCourseWare, n.d.). The Open University in the United Kingdom (UK) has been sharing and promoting the use of OER since 2006 with its OpenLearn initiative. OpenLearn now makes available nearly 1,000 courses at no cost to learners (The Open University, n.d.). In 2012, the United States (U.S.) Department of Labor invested $500 million in grants (bringing their total grant funding up to $2 billion) to U.S. community colleges to develop work-related training and development programs. A requirement of these programs was that grant recipients make their courses and resources openly available (Green, 2012).

The William and Flora Hewlett Foundation, a private U.S. foundation, has been a major global supporter of the creation and use of OER since 2002, supplying millions of dollars in grants every year. The foundation funded over $10 million in OER grants in 2016 (The William and Flora Hewlett Foundation, n.d.). A non-profit U.S. organization called *Achieving the Dream* has provided millions of dollars in funding for a three-year, OER degree project that has enabled 38 community colleges to create 53 degrees and certificates based solely on OER (no textbook costs for learners) (Griffiths et al., 2017).

Many community colleges and universities in the U.S. are reporting success stories involving learner savings and increased adoption of open textbooks (Fischer et al., 2015). In a very recent large-scale study from the University of Georgia ($n = 21,822$ learners), significant gains in learner success (as measured by course grades) were achieved using OER as a replacement for learner-purchased publisher textbooks

(Colvard, Watson, & Park, 2018). Important findings for the study were the significant

learner success gains demonstrated by learners who received Pell Grants (an indicator of

lower socioeconomic status), part-time learners, and learners who identified as ethnic

minorities. In a U.S. report entitled *Opening the Curriculum*, authors Allen and Seaman

(2014) provided evidence that awareness and use of OER was increasing among colleges

and universities. The researchers conducted a survey on open educational resources that

included 2,144 community college and university faculty. They found that use of OER

was not yet mainstream, but noted that faculty who were aware of OER believed it was

equal in quality to traditional resources.

In the Canadian public education context, provincial governments drive education

funding and policy decisions; there is no federal, centralized department of education.

Provincial educators and legislators are becoming aware of the potential of OER to

reduce education costs. Politicians and policy-makers are exploring the development and

implementation of OER in a number of K-12 and higher education contexts. However,

Canadian provinces lag behind other jurisdictions in terms of research and exploration of

the potential for OER to reduce the cost of education and increase personal learning skills

(McGreal, Anderson, & Conrad, 2015). BCcampus, with provincial funding, has

achieved significant success over the past five years, particularly in the adoption of open

textbooks as one method of reducing education costs for learners. On their OpenEd

website, they have reported the participation of 40 institutions, resulting in learner

savings of approximately $8.8 million dollars, and 2,171 adoptions of open textbooks

(BCcampus, n.d.). In the province of Alberta, the Campus Alberta OER Initiative

received government funding from 2014-2017 to explore the potential value of OER in

Alberta post-secondary contexts. The program was discontinued in 2017, however the Alberta OER team was able to disseminate funding toward the completion of several OER development and adoption projects. These projects resulted in post-secondary student costs savings forecasted over a five-years (from 2016 to 2021) of approximately five million dollars (Campus Alberta OER, 2017).

While awareness of and policies regarding OER are building in Canada, Canada shares several literature-identified obstacles to educator use of OER and open textbooks. Specifically, these obstacles include a lack of institutional policy and support, and lack of evidence that use of OER leads to equivalent or better outcomes for learners (Camelleri, Ehlers, & Conole 2011; D'Antoni, 2008; Jhangiani et al., 2016). Additional challenges include a disorganized supply of OER (repositories that are perceived as difficult to search), lack of funding to engage in pedagogic research, a lack of agreed-upon standards to measure the effectiveness of OER for teaching and learning, and few well-established quality assurance standards or peer review processes (Camelleri et al., 2011; Clements, Pawlowski, & Manouselis, 2015; The William and Flora Hewlett Foundation, 2013). To begin to address these obstacles in Ontario, this study focused on measuring existing levels of awareness and use of OER among educators, and fostering partnerships with OER advocates who supported the design and facilitation of a program of communication and professional development. This innovation was an intentional and collaborative community-building campaign to achieve increased use of OER in Ontario post-secondary education.

Local Context of the Study

Situational context. During this study, my professional role has been that of learning designer and program manager working for a government-funded post-secondary education organization in Ontario, Canada called eCampusOntario. My organization serves 45 public colleges and universities across the province and my work includes support for learners, educators, and administrators at these institutions. My practice provides me with a unique opportunity for exploration and data collection for research.

In addition to operational funding for its mandate, eCampusOntario attracted large-scale investment and interest from the government of Ontario in 2017 to promote the use of open textbooks as a means of reducing the overall cost of post-secondary education for learners. Directly related to the purpose of this study, in June 2017, the Province of Ontario announced a $1 million initiative to fund the adoption, adaptation, and creation of open textbooks (Province of Ontario, 2017). In the 2017-2018 academic year, 23 open textbook adoption, adaptation, and creation projects were funded and completed.

Personal context. In my role as a program manager during this study, my practice took the form of collaborative discussion and partnership with educators and learners across the spectrum of online and technology-enabled practice, including use of OER. I was specifically assigned (as of July, 2017) to develop and implement a province-wide plan for OER community building for the 2017-2018 academic year. I was empowered, with permission and support, to engage in a variety of strategies to achieve the goal of increased use of OER and open textbooks in Ontario.

Related to both my work and doctoral studies, my philosophical stance about education is that knowledge is socially constructed, and is therefore flexible and ever changing. Use of OER aligns very well with what I perceive as the power of diversity in the adaptation of digital learning materials to local languages and contexts. Use of OER also represents a significant opportunity to involve learners in the co-creation and continuous improvement of teaching and learning resources for themselves and others. Throughout this study, I found myself in a unique position in which my passion for open education, my research, and my work responsibilities were extremely well aligned.

For purposes of this study, I had access to a community of practice focused on use of OER and open textbooks in Ontario. In partnership with members of this community, I designed a multi-layered awareness and support strategy for increasing use of OER. I was deeply engaged by the potential of this study to demonstrate the ways that OER might increase learner and educator engagement in the process of teaching and learning, and how OER might reduce the overall cost of education for learners by reducing textbook costs. It was my hope that developing and piloting a strategy for community development around the use of OER might also provide a framework that others might test in their contexts. I learned a great deal throughout the cycles and final work of this research, which remained grounded in the purpose and research questions throughout.

Purpose of the Study

The purpose of this mixed-method action research study was to determine the usefulness of an awareness and support strategy to increase the use of OER among post-secondary educators in Ontario.

To achieve the purpose, I partnered with a small group of Ontario and Canadian OER advocates who helped me develop a series of workshops, webinars, and a MOOC (massive open online course) that constituted the intervention of the study. OER advocates in this study were eCampusOntario colleagues, and Ontario and Canadian educators. These educators were mature practitioners in the use of OER. I requested that the OER advocates with whom I was working identify and share their goals and motivation for participation in this initiative so that I might learn more about their perspectives as change agents.

The primary participants for the study were Ontario educators ($n = 38$) who were new to the use of OER in their practice. For this group, I designed and disseminated a pre- and post-innovation survey instrument based on Ajzen's (1991) Theory of Planned Behavior model. Ajzen's model helped me examine the ways that attitude toward OER, and educators' self-identified skills related to finding and using OER, might have influenced their intention to use OER in their practice. There were two types of interventions and two separate cohorts among the 38 participants. For face-to-face workshops, there were 14 educators from Ontario colleges and universities. For the MOOC (a two-week, open online learning experience), there were 24 Ontario educators. I designed multiple opportunities to learn with and from these two groups of participants in spring 2018.

The research questions listed below guided my data collection and analysis. These questions helped me to focus my inquiry on the motivations and perspectives of Ontario educator participants and OER advocates. They also helped me to develop accurate measures for the usefulness of my strategies.

Research Questions

1. How do OER advocates define their goals and motivation for the use of OER?

2. To what extent might the OER professional development experiences of this study impact educators' intention to use OER?

3. What questions and insights about OER emerge as part of a sensemaking process among educators?

4. In what ways might professional development related to use of OER be improved?

Summary

The primary obstacles in addressing my problem of practice, low awareness and use of OER were reflected in the research literature at local, national, and international levels. From a global, social justice standpoint, the rise of interest, funding for, and use of OER points to the potential of these resources to increase access to post-secondary education by reducing costs for learners. Reducing the cost of formal education is a common goal for Ontario post-secondary institutions and the Government of Ontario. Increased access to education is a core value for me as an educator and learning designer. I used the opportunity of this professionally aligned dissertation to demonstrate leadership in OER research for Ontario, and explore the potential for OER and open textbooks to increase post-secondary access for Ontario learners.

In the following chapters, I describe a selection of the literature regarding OER, my proposed intervention, and the theoretical perspectives that I used to inform my inquiry. I identified and described a mixed-method action research approach that was used to gather and analyze data, and further described my context and the participants.

Results from analyses, findings, discussion, and conclusions were added as the research design unfolded.

CHAPTER 2

Theoretical Perspectives and Research Guiding the Project

An examination of the literature on open educational resources (OER) revealed many studies and examples from practice that pointed to the value of using openly licensed learning materials. Among research reports about OER, there were definitions and a history of the OER movement, articles that described use of OER in post-secondary education, and articles related to educator and learner perceptions and experiences. A variety of reports about OER initiatives from around the world helped to situate the intervention for this study—a multi-layered OER awareness and support strategy for Ontario educators. In addition to literature about OER, literature related to MOOCs was included to contextualize one of the intervention strategies used as professional development with Ontario educators. Literature related to the theoretical perspectives guiding the study was explored in terms of Rogers' (2003) Diffusion of Innovations framework, Weick's (1995) sensemaking recommendations, Ajzen's (1991) Theory of Planned Behavior, and Wenger's (2000) social learning and community of practice (CoP) models.

Open Educational Resources (OER) and Open Textbooks

In many studies reviewed for this research, the exploration and use of OER was grounded in the history of the open education movement. In the literature about OER, researchers connected key aspects of the current worldwide open education movement to early, public sharing of digital resources using the Internet (Kernohan & Thomas, 2012; Wiley, n.d.). One example was MIT's OpenCourseware (OCW) initiative, established in 2001. MIT professors were encouraged by policies and opportunities enabling them to

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publicly share their course materials with interested learners through an institutional, open digital repository. Another example of early contribution to the OER movement was the formation of the Creative Commons organization led by Larry Lessig, a Harvard law professor. The purpose of Creative Commons was to encourage uncomplicated and individual expressions of copyright and the use of open licenses for the purposes of shifting an "all rights reserved" paradigm to a "some rights reserved" paradigm. Creative Commons' vision statement was a very clear example of the intent of the open movement. As they stated, "Our vision is nothing less than realizing the full potential of the Internet—universal access to research and education, full participation in culture—to drive a new era of development, growth, and productivity" (Creative Commons, n.d.).

Through grassroots movements and the connection and communication opportunities made possible by the Internet, use of open resources among post-secondary professionals, artists, and programmers grew rapidly between 2000 and 2002 (Institute of Education Technology, n.d.; Kernohan & Thomas, 2012). In 2002, participants at a UNESCO conference in Paris established a definition of OER to help increase global access to education with a particular focus on the Global South (UNESCO, 2002). In addition to the UNESCO definition, several definitions of OER were present in the literature, along with a variety of perceptions of how OER were used in post-secondary practice (Allen & Seaman, 2014; Butcher & Hoosen, 2012; Zancanaro, Todesco, & Ramos, 2015). Based on this literature, an amalgamated definition of OER was created for this dissertation research, as follows:

> Open educational resources (OER) are digitally stored, openly available content
> materials that are explicitly openly licensed (using Creative Commons or other

open licensing standard). Creators/author(s) grant permission and help ensure discoverability and ease-of-use for download, storage, adoption, adaptation, and re-sharing of these resources as part of learning experiences. Content types may include video, audio, text, textbooks, images, illustrations, animations, and simulations that are editable and adhere to inclusive design principles for accessibility.

While there were many types of small-scale and large-scale OER described in the literature, open textbooks were a specific focus for many research projects related to use and effectiveness of OER for learning.

Open textbooks. Open textbooks were referenced in the literature as a specific sub-group of OER relevant to post-secondary education. Staff at OpenStax, a Rice University department and early pioneer group, focused on the development of open textbooks shared with the Creative Commons Attribution-only license. The textbooks were made available in a variety of file formats for digital or printed reading. OpenStax promoted these textbooks as a potential alternative to expensive, publisher-released textbooks. They also pointed to the use of open textbooks as one possible way to solve book shortages around the world (especially in developing nations), and promoted the potential of open textbooks to be customized to local contexts (OpenStax, n.d.). One of the purposes of OpenStax open textbooks in first- and second-year post-secondary topics such as biology, chemistry, physics, sociology, and astronomy was to replace expensive publisher textbooks produced by for-profit companies such as Pearson, McGraw Hill, and Cengage. Connexions, the parent organization for what is now OpenStax, was established in 1999 and the open textbook collection, funded by Rice University and several major

foundations, contains over 30 major higher education titles written by peer-reviewed collaborative teams of educators. As an indicator of growth and use by learners and educators, OpenStax reported that in 2018, 2.2 million students were using their textbooks, resulting in cumulative savings of $177 million (OpenStax, 2018).

Several studies in the literature of post-secondary OER focused on open textbooks as replacements for learner-purchased publisher materials (Colvard, Watson, & Park, 2018; Jhangiani, et al. 2016; Fischer, et al. 2015). According to Florida Virtual Campus (2016), 66% of learners surveyed had *not* purchased required textbooks for their courses. The population for this survey consisted of all state university and community college learners in the state of Florida, $n = 22,000$ (approximate responses across all questions). Specific findings were that 53% of learners spent more than $301 (USD) on textbooks in the Spring 2016 semester, and 18% spent more than $500 (USD). This particular study has been frequently cited in the literature on OER to establish the importance of low or no-cost alternatives for post-secondary learning.

A caveat related to open textbook cost savings, cited in the millions of dollars by groups like OpenStax, is that they were most often calculated on the basis of a textbook replacement model. This replacement model, described by Hilton III, Robinson, Wiley, and Ackerman (2014) for their study, began with a review of the syllabus of a course for required textbooks, incorporated the purchase price of a new textbook as provided by the participant institution's bookstore, and multiplied cost by the number of registered learners in the course. This model, an extremely common return-on-investment calculation among open textbook users and providers, does not account for real-world paradigms and may represent inflated cost savings. After all, not all learners in a course

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purchase a required textbook at full price through the campus bookstore (Florida Virtual Campus, 2016). To date there are few alternatives to easily explaining the benefits of OER and the textbook replacement model has become a common open movement option for measuring and communicating impact.

Weller (2014) described open textbooks as a simple paradigm for educators to consider:

> Perhaps one reason why open textbooks are proving to be a fruitful area for OER implementation is that they readily map onto existing practices. Open textbooks simply require an educator (or institution, state, or country) to recommend a different textbook. As long as the quality of this book is deemed to be as good, if not better than the standard text, the cost savings alone become an irresistible driver for their uptake. Choosing between two alternatives of equal educational value, the price becomes a factor, and free is difficult to beat (p. 77).

The ease with which textbooks map onto existing practices in post-secondary education contexts might have been a contributing factor to the number of studies focusing on open textbooks as the primary form of OER. Even with the simple concept of a substitution model as one option to increase use of OER, works the literature of OER described a persistent problem for increased use–the problem of awareness.

Awareness of use of OER. A common theme in the open educational resource literature was that educators and post-secondary institutions were still at very early stages of awareness and adoption of these resources (Allen & Seaman, 2014; Kelly, 2014; McGreal et al., 2015; Rolfe, 2012). According to Allen and Seaman (2014), among U.S. educators, 66% had heard of OER but did not know much about using them, 34% had not

heard of OER at all, and only 5% were able to define OER, or confirm that they were using them in courses. However, many educators were described in the study as unknowingly using open resources (such as images, Wiki articles, and other openly licensed Internet resources) without necessarily labeling them OER (Allen & Seaman, 2014).

Other studies pointed to three factors that contributed to a lack of awareness and adoption of OER:

- a traditionally closed (non-sharing) culture among educators that prohibited use of OER (Rolfe, 2012);

- little or no centrally defined policy or professional development related to awareness and use of OER, leading to restricted choice for content materials (McGreal et al., 2015); and

- insufficient use of research-based models such as planned behavior, technology acceptance, stages of concern or other innovation/change practices to measure educator intention to use OER (Perkins, 2011).

In addition to *awareness* of OER, which was described an important obstacle to overcome in order to increase use of OER, articles from the literature also described the importance of educator motivation related to increased use of OER.

Motivation to use OER. Three key motivating factors for use of OER were cited in the literature. As discussed previously, the primary one was the potential to reduce learner textbook costs (Butcher & Hoosen, 2012; Florida Virtual Campus, 2016; Senack, 2015). According to the College Board (2014), the average cost of undergraduate textbooks and fees per year (in addition to tuition) was $1,200 (USD) in 2014-2015. This

learner-burden model, with its associated costs for textbooks, was described as favoring affluent learners. Financial inequity was cited as a barrier for learners with low socioeconomic status, particularly those attending community colleges (Bliss, Robinson, Hilton III, & Wiley, 2013; Butcher & Hoosen, 2012). Several studies described the use of OER, particularly open textbooks, as an important strategy for post-secondary education institutions and educators concerned with issues of cost-based access and equality (Bliss et al., 2013; Butcher & Hoosen, 2012; Lund Goodwin, 2011; Senack, 2015).

A second motivating factor for using OER was described in the literature as an Internet-driven shift in how and where people find information. Widespread development and sharing of OER was not feasible before the Internet (Wiley, n.d.). The amount of content stored and transmitted across Internet-enabled channels is described as a fundamental change in how people communicate, share knowledge, and learn in the 21st century (Carey, 2015; Deimann & Farrow, 2013; McGreal et al., 2015). Post-secondary educational institutions, libraries, museums, and other traditional repositories and disseminators of knowledge are depicted as no longer being in control of scarce resources. A review of the literature confirms that there is now open information in abundance at a global scale (Carey, 2015). This abundance is described as a powerful factor that might be influencing how educators and institutions are reframing their work in the context of informal learner access to information (Carey, 2015; Deimann & Farrow, 2013).

A third motivating factor for use of OER described in the literature was the empowerment of educators and learners to find, download, print, adapt, remix, and redistribute resources as part of the blend of teaching and learning in post-secondary

contexts (Wiley, 2013). These activities were often described as open educational

practices (OEP), or open pedagogy. Several authors observed that these practices were

only possible in the context of Internet-enabled content distribution using open licensing

paradigms. Several authors described the ways that OER had empowered academic

learning activities that were highly prized in post-secondary contexts, such as critical

thinking, critical reflection, self-directed exploration, and co-creation of knowledge

(Cronin, 2017; Deimann & Farrow, 2013; OLCOS, 2012; Wiley, 2013).

OER initiatives, as described next, were the logical outcome of increased

awareness among educators about the value of OER, and sufficient motivation to use and

research their effectiveness.

OER initiatives. Many articles in the literature described OER use and research

into such use over the past 15 years or so. Some initiatives were described as having set

the stage for a rapid proliferation of OER adoption. In 2002, The William and Flora

Hewlett Foundation became a landmark funding source for OER initiatives, including

MIT's OpenCourseWare project, the Open University UK's OpenLearn initiative, Rice

University's Connexions and OpenStax development and repository, and Utah State

University's Center for Open and Sustainable Learning (Atkins, Seely Brown, &

Hammond, 2007). Creative Commons was a regular recipient of funding from the

foundation; these funds, in the tens of millions annually, have been used to raise public

awareness of the power of OER to reduce education costs. A large, global, OER-focused

organization was described in the literature as the Open Education Consortium (Lund

Goodwin, 2011). This organization has hundreds of higher education institution members

and hosts public-facing education materials about OER, as well as providing linked repositories of open education research and resources (Open Education Consortium, n.d.).

Two articles from the research into open education provided particularly persuasive evidence for the use of OER for learner success. Fischer et al. (2015) gathered data from multiple institutions implementing no-cost open textbooks in community college and university settings, and provided one of the first comprehensive investigations of learner outcomes using OER. The authors used a quasi-experimental method, with a control group of more than 11,000 learners, and a treatment group of nearly 5,000 learners registered in 15 different courses. They found that in most courses, there was no significant difference in learner outcomes. This meant that use of OER did not negatively impact learner achievement. In several courses, the treatment group learner outcomes (grades) were superior to the outcomes of those in the control group. In addition, continued enrollment (learners enrolling in additional courses for the semester after the trial), was higher in the treatment group. This element of persistence represented a vital measure of learner and institutional success related to the use of OER. The researchers described this re-enrollment behavior as an indicator that OER cost savings might have had a positive impact on learner completion of degrees in shorter time periods. The researchers were careful to indicate that their findings pointed to enhanced probability and not causation (Fischer et al., 2015).

A more recent study by Colvard, Watson, and Park (2018) focused on U.S. post-secondary issues regarding completion and retention, affordability, and quality of student learning related to use of OER. The researchers examined an open textbook replacement strategy that spanned three years (2013-2016) at the University of Georgia. They

compared 11,681 students using traditional textbooks with 10,141 students using OER in the same courses with the same instructors. The courses were first-year, large-enrollment courses for which open textbooks from OpenStax were relatively easy to adopt. The researchers' focus was on differences in course performance, particularly final grades and instances of DFW (letter grades of D, F, and withdrawals from the course – W) among students with low socioeconomic status (Pell Grant recipients), non-white students, and part-time students. The disaggregated data for these groups were deemed very important, especially when considering issues of completion and affordability of post-secondary education. These researchers were able to establish that significant gains in course grades occurred when students used OER rather than traditional textbooks. Participant data also showed that there were significantly fewer instances of DFW among those groups who struggle to get accepted into and complete post-secondary education. Findings from this study provide an additional case for the value of OER in post-secondary contexts in terms of increased success for marginalized learners.

While these studies in the literature pointed to potential positive outcomes from the use of OER, the literature also provided both learner and educator perceptions of the quality and experiences selecting and using OER in post-secondary contexts.

Learner perceptions of OER. Despite reports of learner concern about textbook costs in the literature, few studies investigated learner awareness of OER (or open textbooks) as a potential solution. In the Florida Virtual Campus (2012b) study representing nearly 14,000 learner respondents, only 26% had heard of open textbooks, and only 6% reported using them in a course. Bliss et al. (2013) conducted a qualitative survey of 490 learners and 58 educators to explore experiences in pilot open textbook

courses. A small number of learners (10%) reported technical challenges and other negative experiences related to open textbooks. Among this group, there were general concerns about textbook quality. One learner reported that the lack of color images in printed open textbooks was a challenge, and one learner felt that the quality of the practice problems included in the open textbook was low. However, the majority of learners who had used open textbooks felt they were equal to or better quality than publisher textbooks. Learners cited ease of portability (digital textbooks are not heavy) and the inclusion of digital assets such as interactive diagrams, activities, and videos as benefits (Bliss et al., 2013).

Educator perceptions of OER. In literature focused on perceptions of use of OER, educator opinions about quality and implementation of OER were similar to those of learners (Florida Virtual Campus, 2012a). The majority of studies focused on open textbooks. Most educator-respondents who had used open textbooks felt that the books were of equal in quality to or better than publisher textbooks (Bliss et al., 2013). Pitt (2015) conducted a small mixed-method study with educators ($n = 143$) who had adopted OpenStax open textbooks in their courses. She found that a majority of educators in her study (over 85%) indicated that learners benefited from the cost of using OER. OER were described by the educators as beneficial in terms of learner exposure to multiple perspectives. These educators also reported that use of OER helped learners to develop more independent learning skills with increased self-efficacy. Educators in this study described a spectrum of time commitments required to transition their courses to use of OER. Some found the transition easy (simply replacing one textbook with another), but

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some found it very difficult in terms of the shift in pedagogic practice and replacement of course assessments.

Educator perceptions of OER were mostly grounded in the experience of early adopter educators willing to take a risk and try a new type of resource in their practice. For many educators, as described in the literature of OER, there were a variety of obstacles to experimentation that would need to be overcome if use of OER were to expand into mainstream practice.

Obstacles to using OER. While successes in early OER initiatives were described in the literature, there were also several obstacles cited. As noted earlier in this section, a lack of awareness of open resources was cited as a fundamental barrier to using them (Allen & Seaman, 2014; Kelly, 2014; Rolfe, 2012). In addition, the act of searching for OER was described as difficult. There were several large repositories named in OER studies where educators might search for OER. Among these repositories, however, lack of organization, lack of quality assurance or peer review data, and lack of discipline-specific resources were listed as challenges to adoption (Clements & Pawlowski, 2012; Mtebe & Raisamo, 2014). Other barriers to use included lack of institutional expertise, lack of support, and insufficient policy guidelines (Kelly, 2014; Mtebe & Raisamo, 2014; Rolfe, 2012). Clarity around copyright and licensing rules were also cited as key challenges to OER adoption (Rolfe, 2012; Mtebe & Raisamo, 2014).

A lack of evidence of the effectiveness of OER was described as a common concern among stakeholders in several studies. Educators considering a shift in their practice were interested in evidence about whether or not OER resulted in improved learner outcomes (Bliss et al., 2013; Mtebe & Raisamo, 2014; The William and Flora

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Hewlett Foundation, 2013). A finding from several studies was that use of OER, particularly open textbooks, resulted in no significant difference in learning outcomes, or in some cases, improved outcomes when learners used open textbooks instead of learner-purchased publisher textbooks (Colvard, Watson, & Park, 2018; Fischer et al., 2015). While no significant difference might have seemed like a neutral or negative finding, and an obstacle to be overcome, what it meant for researchers was that open textbooks, with zero cost for digital access, were just as effective for learning as significantly more expensive publisher materials. Finally, one of most persistent obstacles for use of OER cited in the literature was finding sufficient time for educators to research resources and redesign courses (Bliss et al., 2013; Lund Goodwin, 2011; McGreal et al., 2015).

Summary of OER Literature

The literature on OER provides evidence-based information about the benefits and challenges of using OER for both educators and learners. A clear definition of OER has been established to help guide professional development and other possible interventions to increase awareness of OER. Initiatives that have been successful in post-secondary institutions were examined for keys to success, and relevant learner and educator perceptions of OER were explored. One of the most valuable elements within the literature for this study was the spectrum of obstacles to adopting OER as described by educators. Knowledge of these obstacles provided an opportunity to form strategies to overcome them.

A core part of overcoming literature-identified obstacles to increased use of OER was embedded in the action research design for this study. As described in more detail in the Methods section, this study included interventions. These interventions were

professional development events designed to increase awareness and use of OER among Ontario educators. One of the interventions was the design and delivery of a MOOC (massive open online course). In the next section of this review, select literature about MOOCs was examined to provide some history and context for this element of the research design.

MOOCs as Professional Development

The intervention for this study included an open online course, increasingly known by its abbreviation, MOOC. Several articles in the literature on open education investigated this type of online community learning. MOOCs were first conceived and designed by Canadian researchers George Siemens and Stephen Downes in 2008 and were originally designed around connectivist principles, which posit that learning in a community of practice occurs through networked connections and access to digital resources (Daniel, 2012). In 2011, the MOOC paradigm rose to fame when Sebastian Thrun designed and delivered a MOOC on artificial intelligence with over 150,000 learners. Since 2012, several global providers of MOOCs have emerged, including Coursera, edX, and FutureLearn, and millions of learners have tested them. MOOCs may have potential as professional development (PD) ecosystems. As Littlejohn and Milligan (2015) noted in their article about MOOC design for professional learning, "MOOCs have the potential to transform professional learning by utilizing social, networked technologies to support personalised and self-regulated learning. However, successful innovation requires good design choices" (Littlejohn & Milligan, 2015, p. 2).

These two authors recommended the following design practices for creating effective MOOCs for professional development: design flexible learning objectives to

encourage learners to set their own goals, provide opportunities for work-based practice, capitalize on participant diversity, ensure learners have opportunities to relate learning to theory, and encourage the creation of a project or set of outputs that have professional value beyond the course (Littlejohn & Milligan, 2015). These recommendations were incorporated in the design of the MOOC for this study.

In the next section of this review, four frameworks, or theoretical perspectives, that informed the development of the intervention and method for the study were explored. These frameworks were Rogers' (2003) Diffusion of Innovations, Ajzen's (1991) Theory of Planned Behavior, Weick's (1995) sensemaking theory, and Wenger's (2000) social learning and community of practice (CoP) model. The work of these authors and researchers provided avenues to explore the social learning systems and communication channels embedded in the Ontario post-secondary education context.

Theoretical Perspectives Informing the Study

Diffusion of innovations. In much of the published literature examined for this study, use of OER was cited as an innovation (Ehlers, 2011; Jhangiani et al., 2016; Masterman & Wild, 2011). Rogers' (2003) Diffusion of Innovations model was a selectively cited framework in the literature for articulating activities and processes that might accelerate diffusion of an innovation such as OER. A starting place for considering how to increase the rate of adoption of OER involved examining the meaning of both innovation and diffusion. Rogers defined an innovation as any new idea or practice; the idea only had to be new to the person learning about it, or considering using it, and innovations were often ideas already in use outside the sphere of the individual. He

described diffusion as a process of communication about an innovation among those within a social system (Rogers, 2003).

An important element in Rogers' theory was the idea that innovations do not occur as independent events, but rather as part of complex and interdependent systems. This concept of complexity resonated with me in the context of encouraging the use of OER as an innovation for educators in my post-secondary context. OER was definitely not the only innovation educators were under pressure to consider during my study. Two other examples of complexity in post-secondary practice were technology-enhanced and fully online teaching and learning.

As part of post-secondary teaching and learning, digital methods of course design and delivery were described as being in flux. Allen and Seaman (2015) reported that only 28% of educators believed in the value and effectiveness of online teaching and learning. This finding was an indication that there were many educators that had not yet embraced digital paradigms and pedagogic use of technology in their practice. The adoption of OER was described in the literature as being dependent on technology skills, and this might have been a larger obstacle to increased use of OER than anticipated (Kelly, 2014).

Two key models from Rogers' (2003) Diffusion of Innovations theory were tied to OER in the literature. The first was Rogers' perceived attributes of innovations. This model referred to the potential user's perception of relative advantage, compatibility, complexity, trialability, and observability of the innovation. The second model was Rogers' innovation-decision process, described as five levels of user engagement: knowledge, persuasion, decision, implementation, and confirmation. Lund Goodwin (2011) used Rogers' innovation-decision process to explore how faculty at her participant

institution came to decisions about whether or not to use OER. She found that they approached innovation positively, as part of an open library project, because they were provided with an opportunity to obtain information about OER, and given sufficient time (made possible by grant funding) to implement OER in course redesign. Lund Goodwin noted that support and guidance from librarians and instructional designers were extremely important elements in the adoption of OER.

Rogers (2003) described complexity as a significant barrier to innovation, and indicated that reducing complexity was a key factor in innovation success. Recommendations for future practice from Lund Goodwin (2011) included using fiscal or time incentives to motivate faculty adoption of OER, developing a quality assurance strategy to help faculty identify OER, and assurance that use of OER was not meant to replace the role of teachers in post-secondary education. These findings were extremely relevant to the proposed action research study on Ontario educator awareness and use of OER.

Perkins (2011) explored Rogers' (2003) theory of perceived attributes to propose a framework for identifying and eliminating barriers to OER adoption. Perkins indicated that in order for OER to be adopted, faculty members must agree that open resources have relative advantage over other forms of content, be compatible with existing and familiar systems of content dissemination, be easy to use (not complex), be available as trial (experimental) initiatives, and demonstrate observable, public effectiveness. He felt that if these conditions were satisfied, faculty member adoption of open resources might be more likely over time.

Change agents. A particular focus in Rogers' (2003) work was the role of a change agent in helping to diffuse an innovation. He defined a change agent as "an individual who influences clients' innovation-decisions in a direction deemed desirable by a change agency" (p. 366). Rogers named the primary strategies of influence for change agents as communication and intervention. He indicated that change agents were go-betweens, somewhat challenged by their roles as intermediaries between a change agency and clients. Rogers listed seven roles for change agents, with the following five highly relevant for this study: to communicate the need for change, to exchange information, to diagnose problems, to translate client intent into action, and to achieve a terminal relationship (which is to say, to create such a clear path for an innovation that clients would no longer require a change agent) (Rogers, 2003).

Rogers also described the characteristics of change agents and noted that their technical competence for implementing an innovation was important in terms of client interactions, but that this competence should be passed on to clients as a long-term strategy. A final observation was that change agents working in decentralized systems were often more successful in terms of individual client success and interactions: "Compared to centralized systems, innovations diffused by decentralized systems are likely to fit more closely with users' needs and problems" (p. 398).

An article focused specifically on change agents in a higher education context provided some relevant observations for the intervention of this study. McGrath, Stenfors-Hayes, Roxå, Silén, and Bolander Laksov (2016) explored how administrative change agents (department heads with little or no formal leadership training) struggled to

communicate and successfully lead top-down change directives among team faculty members, concluding:

> In contrast to the theoretical constructs and discourses, change agents also have to cope with existing, real life teaching and learning regimes (TLR) that are often tribal in nature [specific to members of particular disciplines] … This has implications for how change is enacted. If a top-down policy change is suggested, it may fall on deaf ears unless there is a sense of engagement from the faculty (McGrath, Stenfors-Hayes, Roxå, Silén, and Bolander Laksov, 2016, p. 4).

This research illuminated the complexity of relationships between staff at post-secondary institutions and the practice of change agency in a post-secondary context. For purposes of my own study, I considered myself a change agent, and applied Rogers' (2003) change agent lens to the collaboration and work of the OER advocates, particularly around the values of sharing their technical competence, communicating effectively, and helping to translate participant intentions about OER into action.

In addition to Rogers' Diffusion of Innovations model, a second change management framework called sensemaking (Weick, 1995) was explored for its relevance to my Ontario post-secondary context. There were two key examples in the literature of sensemaking as change management that provided recommendations related to the action research for this study.

Organizational sensemaking. Weick, Sutcliffe, and Obstfeld (2005) explored the model set out in Weick's (1995) *Sensemaking for Organizations* in the context of past and future research in their field of organizational psychology. They provided a variety of clarifications and recommendations about sensemaking:

Viewed as a significant process of organizing, sensemaking unfolds as a sequence

in which people concerned with identity in the social context of other actors

engage ongoing circumstances from which they extract cues and make plausible

sense retrospectively, while enacting more or less order into those ongoing

circumstances (p. 409).

This description inspired reflection and consideration of how use of OER might or might

not make sense to my participants. Elements of sensemaking in this study included

attention to elements of educator identity that might emerge in times of change, social

relationships among peer educators, the importance of plausible explanations of OER as a

new practice, and methods of re-establishing order after a disruption in practice.

In their framing of sensemaking and sensegiving processes, Weick et al. (2005)

provided advice, which included embracing initial reactions from participants when

confronted with a new practice. They described a process where the introduction of a new

concept might elicit questions among stakeholders such as, "what's the story here?" and

"now what should I do?" (p. 410). The authors advised that an effective change leader

should anticipate these types of questions and develop a facilitative and consultative

process grounded in the practices, identities, and social contexts of the work of

stakeholders.

Weick et al. (2005) pointed out that sensemaking and plausibility were not

absolute (there was not "one way" or "one answer"). Making sense was an emerging and

iterative process that changed, depending on the stakeholder audience. They advised that

the story of a new practice might need to be redrafted many times to ensure that it was

well understood by the intended audience, and that the story incorporated emerging

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research and personal experience gathered in consultation with stakeholders. The authors also felt that these strategies would help to make a new practice more resilient in the face of resistance.

Of particular relevance for the present research, Weick et al. (2005) noted the close connection of sensemaking with practitioner identity. As an example, the authors pointed out that peoples' identities were often tied to the opinions of others. Relating to this concept, I developed the following scenario for my study: If learners felt that an educator should use OER because it represented a financial benefit (for learners), and an educator felt that their positive identity as a teacher was linked with learner success, then the educator might be more inclined to consider a new practice (such as use of OER) to maintain their continuing positive self-identity as "a caring teacher." Articulating and leveraging the benefits for learners, coupled with acknowledging the importance of the identity of a caring teacher, was one strategy in building the awareness and support activities of the intervention for this study.

Kezar (2013) provided a case study of post-secondary education organizational change management processes based on Weick (1995). Kezar adapted and interpreted Weick's principles as part of a case study focused on the change management processes being used on 28 campuses to increase interdisciplinary approaches to science education. Staff at the campuses selected for Kezar's study were engaged in multi-year transformational practices related to interdisciplinary education, and she tracked their change management strategies over a three-year period.

Kezar (2013) described sensemaking as a process of social construction that individuals and organizations used to manage the near constant creation and re-creation

of meaning in their work. She noted that any successful process of change for an organization, in other words, "making sense" of something new, would require that stakeholders confirm relevance and meaning for themselves and for their colleagues regarding the proposed change. Kezar also compared sensemaking with sensegiving: "Sensemaking is about creating an understanding of the change, while sensegiving is concerned with influencing the outcomes, communicating thoughts about change to others, and gaining support" (p. 763). These dual processes, sensemaking and sensegiving in Kezar's study, were fluid and constant among participants. The more successful campuses in her study, with respect to fully establishing interdisciplinary practices over many years, were able to establish grassroots sensemaking and sensegiving activities (at the level of individual educators and departments) while avoiding top-down approaches that dictated change.

Kezar's (2013) recommendations for successful sensemaking and sensegiving activities included the following:

- returning to sensemaking processes within teams and departments through all phases of implementation of a specific change (in the form of constant conversations);

- conducting frequent meetings with department chairs and learner groups to engage in sensegiving activities, which should be sustained over time to inform new staff;

- communicating across campus with all departments (even those outside of science);

- inviting outside speakers to share success stories related to the change;

- reducing misconceptions about the innovation you're attempting to achieve by sharing local success stories and sharing new research over time;

- focusing on the benefits for the students and not describing practices as "new," but rather as an extension of existing practices; and

- maintaining a realistic view of the barriers to change (sensemaking), and the solutions required to overcome those barriers (sensegiving).

The concepts of sensemaking and sensegiving described in Kezar's study were exceptionally relevant to this current study about OER in an Ontario post-secondary education. Post-secondary educators are often embedded in complex and decentralized systems (Rogers, 2003). Such systems require highly contextualized strategies for change management. Weick's (1995) sensemaking, as described by Kezar was a well-aligned contextual example.

Rogers' (2003), and Weick's (1995) change management models provided a useful foundation for the design of the interventions for this OER research study and contributed several ideas for qualitative data collection and analysis. To help ensure a balanced mixed methods approach, Ajzen's (1991) quantitative framework, the Theory of Planned Behavior, was selected for its relevance to post-secondary education change processes.

Theory of Planned Behavior

Use of OER was described in the literature as a significant shift from traditional practice, and several key obstacles were described, including awareness, implementation, quality, time management, and effectiveness for learners. Some of these obstacles were explored in the literature using Ajzen's (1991) Theory of Planned Behavior (known as

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TPB). As demonstrated in Figure 1 below, Ajzen's theory used a simple framework to describe the complex process of forming an intention to take action (behavior). Ajzen described three key influences on intention as *attitude* toward the behavior (personal feelings and beliefs about it), *subjective norm* (perception of the beliefs of others about the behavior), and *perceived behavioral control* (the degree to which a person believes he or she can successfully enact the behavior).
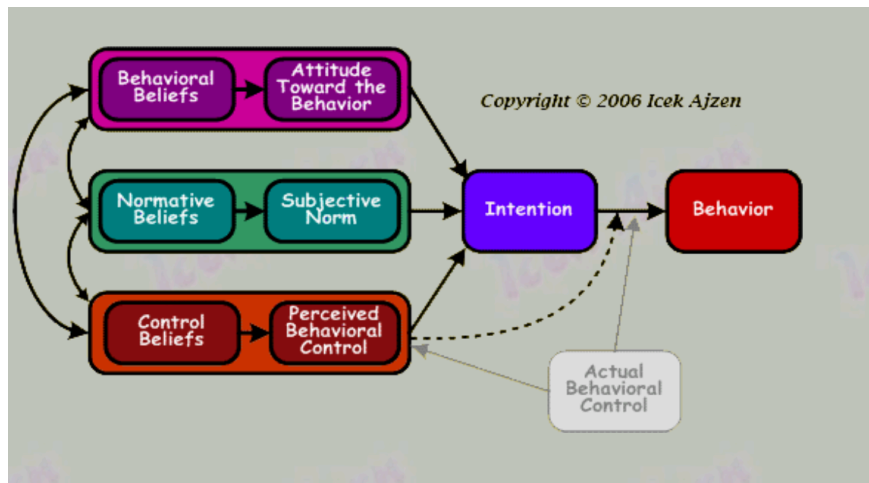
Figure 1. Theory of Planned Behavior. This figure describes influences on intention and behavior as described by Icek Ajzen (Ajzen, 2006).

There were two relevant studies from the literature linking education and TPB. The first was a technology example in which Lee, Cerreto, and Lee (2010) contended that prior unsuccessful studies using TPB were too broad in scope. The researchers experimented with narrowing the desired behavior of their study to a very specific task – the intention to use PowerPoint (PPT) or other presentation software as part of classroom teaching within the next month. They determined that this narrowing of the target behavior supported effective use of TPB in predicting behavior based on intention. In addition, they found that attitude toward the behavior was the most important element of

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the TPB model for predicting intention, and that this might usefully be a core focus for future research.

The second example using Ajzen's (1991) TPB in the literature was connected directly to use of OER. Mijares, Bustamante, Ayo, Anacio, and Jotic (2017) studied current technical proficiency, attitudes toward OER, and intentions of pre-service teachers in the Philippines regarding use of Web 2.0 tools and OER in their practice. They used a slightly modified version of TPB called the decomposed theory of planned behavior (DTPB). A key difference in the DTPB version was that it contained an element of pre-teachers' attitudes toward the behavior called "compatibility." This concept of compatibility, how well OER fit for an educators' teaching needs, seemed a critical component for the present study on the use of OER in Ontario, relating to use of open textbooks (as a sub-group of OER). Weller (2014) indicated that one of the keys to success for open textbook adoption and adaptation was that open textbooks were a familiar paradigm for many educators. He posited that an open textbook was highly compatible with educator practices and required few, if any, new skills to use.

Similar to the findings of Lee, Cereto, and Lee (2010), Mijares et al. (2017) found that attitude (including compatibility) toward OER was the most prevalent driver of intention to use Web 2.0 tools and OER among their participants. Literature-based suggestions for strategies to influence the attitude of participants toward OER, to appeal to educators' identities related to use of OER, and to leverage peer influence over the choice to use OER (social norms) were considered highly relevant approaches for this Ontario study.

Social Learning Systems and Communities of Practice

Related to the work of connecting individual educators as a community of
practice, and aligning that community with potential campus OER working groups,
Wenger's (2000) advice about communities of practice (CoPs) as social learning systems
was extremely valuable. He explored the concepts of socially defined competence (what
a community of practice determined competence to be), and individual experiences (what
an individual explored and observed within their personal practice) as key components of
learning and knowing in professional contexts (Wenger, 2000). A variety of CoP
considerations were taken into account for the development of the intervention for this
study. An iterative process of competence, experience, and connection among
participants was anticipated as part of the design. Wenger also examined the concepts of
the boundaries between CoPs and individual "brokers" of knowledge—those who moved
between communities—as central to the development of aligned agreement about high-
level competence.

Based on Wenger's (2000) framework, I took into account the following concepts
for my intervention:

- imagination (how individual and small-scale communities viewed their role in the
  creation of knowledge and practice);
- engagement (how CoPs worked together, in person and virtually, to create
  artifacts, processes, and dialogue about their knowledge); and
- alignment (how members of a CoP looked outside of their context to determine
  gaps in their knowledge and identify which of their practices complemented the
  work of similar CoPs).

Figure 2 represents my interpretation of Wenger's (2000) concepts of social

learning, imagination, engagement, and alignment, and the porous boundaries

between CoPs. For purposes of this study, several stakeholder communities were

considered in the design of the intervention, including post-secondary learners,

administrators, educators, and the Government of Ontario. These communities

engaged in separate yet interdependent practices as social networks.
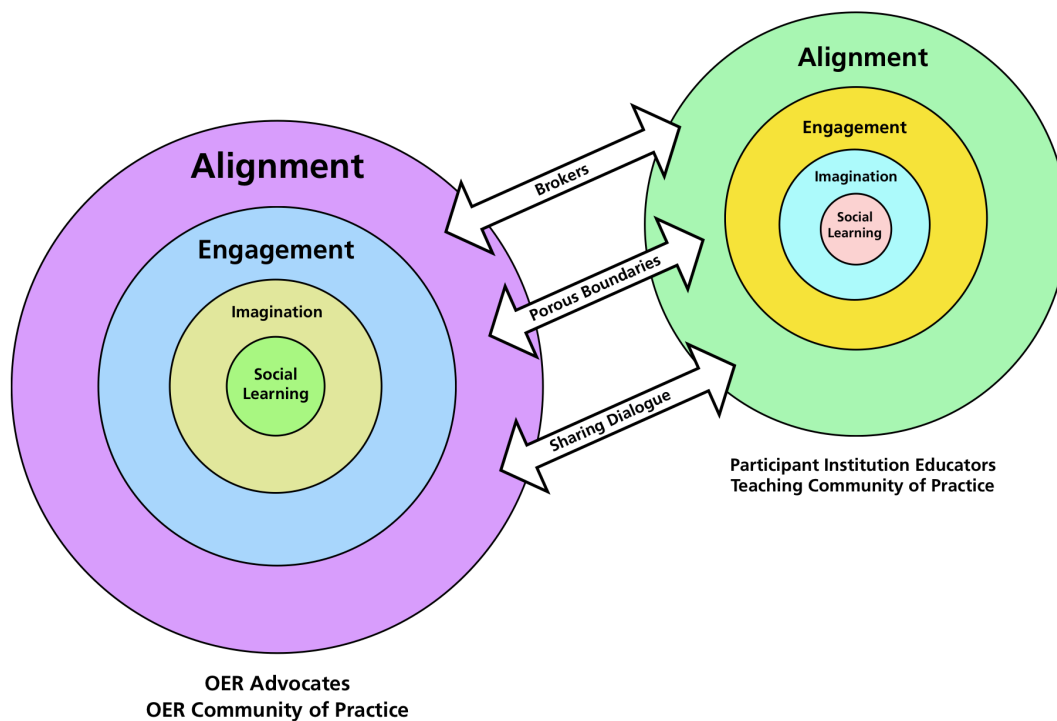
Figure 2. Wenger's (2000) Social Learning Systems and Communities of Practice. This

figure presents concepts related to relationships between communities.

Summary of Theoretical Perspectives

To develop the intervention for this study, four models from the literature on post-

secondary education and OER were reviewed. Rogers' (2003) Diffusion of Innovations

framework, particularly his description of the role of change agents, and Weick et al.'s (2005) description of organizational sensemaking and sensegiving were used to develop communication and support strategies that might be effective for post-secondary educators. Ajzen's (1991) Theory of Planned Behavior was used to describe potential influences on a desired behavior (in the case of this study, the desired behavior is use of OER by educators), and to design quantitative survey instruments that might inform the intervention and measure educator behavior over time. Wenger's (2000) exploration of social learning systems and his CoP model were used to inform an interdependent view of stakeholder communities. These explorations of the literature were essential for achieving the purpose of this study: to determine the usefulness of an awareness and support strategy for increasing the use of open educational resources (OER) among post-secondary educators in Ontario. Informed by the review of the literature and early cycles of the intervention, the method for the study matured and will be presented in the next chapter. Figure 3, shown below is a diagram that represents the theoretical perspectives influencing the study.

Use of OER is Not Widespread among Ontario Post-Secondary Educators

Diffusion of Innovations
Rogers (2003)
· Relative advantage
· compatibility,
· trialability, and
· observability of the innovation

Sensemaking in Organizations
Weick (1995)
· What is the story here?
· Now what should I do?
· Sensemaking
· Sensegiving

Community of Practice
Wenger, (2000)
· Social learning systems
· Brokers
· Imagination
· Engagement
· Alignment

Action Research Interventions

Change Agents (OER Advocates)

Not currently using OER

Theory of Planned Behavior
Ajzen (1991)
Attitude Toward OER
Perceived Behavioral Control
Intention to Use OER

Increasing Use of OER

Using OER

Figure 3. Theoretical Perspectives Influencing the Study. This diagram demonstrates the influences that might help increase use of OER among Ontario post-secondary educators.

CHAPTER 3

Method

The purpose of this mixed-method action research study was to determine the usefulness of an awareness and support strategy for increasing the use of open educational resources (OER) among post-secondary educators in Ontario. The research questions used to achieve the purpose were as follows:

1. How do OER advocates define their goals and motivation for the use of OER?

2. To what extent might the OER professional development experiences of this study impact educators' intention to use OER?

3. What questions and insights about OER emerge as part of a sensemaking process among educators?

4. In what ways might professional development related to use of OER be improved?

The purpose of the study was chosen for its achievable scope. Given the early stage nature of research on use of OER in post-secondary education, and the time-limited nature of my doctoral program, I did not intend to generalize my findings to all post-secondary contexts. My intention was to demonstrate that my intervention was useful for a small group of educators in Ontario and that it might be adapted for use in other contexts.

Mixed-Method Action Research

In selecting a method for this study, I found Ivankova's (2015) mixed-method action research (MMAR) approach to be well aligned with my purpose. I followed her guidance, with a strong focus on integrating my qualitative and quantitative data for

maximum trustworthiness in my findings. Among the choices Ivankova described, I felt the Exploratory and Sequential Qualitative to Quantitative mixed-methods action research approach (Qual-Quan MMAR) was most relevant to my research needs. Ivankova indicated that a Qual–Quan MMAR utilized qualitative findings to inform the development of quantitative instruments, and to iteratively provide rich descriptions that enhanced the integration of participant experiences with statistical findings.

Mertler (2014) indicated that action research blended well with a mixed-method approach. He felt that mixed methods supported the dual goals of (a) describing participant experiences and perceptions, and (b) providing statistical measures related to a practitioner-researcher's stated purpose and research questions. In addition, Mertler suggested that the combination of qualitative and quantitative methods in one study might lead to a deeper understanding of the research problem than either method alone.

Ivankova (2015) found that action research had many advantages. For example, it offered positive features, including its "practical focus, community-based orientation, participatory and collaborative nature, emphasis on empowerment, and value of reflection" (p. 27). Mertler (2014) reported that the process of action research often had a positive impact on teacher quality and effectiveness in classroom practice. I felt that I could substitute the word "practitioner" for the word "teacher" in Mertler's assertion, and so adopted a working hypothesis that action research would lead to improvements in the quality of my work and my personal effectiveness as a post-secondary learning designer, professional development facilitator, and researcher.

Ivankova (2015) described several common features of mixed-method and action research relevant to my study. These included a focus on systematic inquiry, the

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collection of comprehensive information in the form of answers to research questions (mixed methods), and solutions to practical problems (action research). In addition, she felt that mixed methods and action research involved reflective, cyclical (iterative), social justice, and collaborative approaches that empowered the researcher to take on an insider-outsider perspective in partnership with participants and stakeholders.

Pragmatic philosophy. Action research was described by Crotty (1998) as being embedded in a philosophical path of social research that included constructionism as an epistemology, symbolic interactionism (including pragmatism) as a theoretical perspective, action research as a methodology, and the use of survey instruments, observations, interviews, and a list of quantitative and qualitative analyses as methods. He described a brief history of pragmatist philosophy beginning with Charles Peirce, who introduced the concept of pragmatism as a critical philosophy. Crotty contended that pragmatism, in a social research context, had evolved to align more with the work of George Herbert Mead and John Dewey than with Peirce. In Crotty's opinion, pragmatism had come to reflect a populist, rather than critical, view of constructed truth in research methodology. Crotty described a modern pragmatic philosophy that asserted that truth and knowledge were grounded in peoples' social learning and environment, their individual reflection on that learning and environment, and their cultural circumstances (Crotty, 1998).

Ivankova (2015) asserted that mixed methods in an action research context were most closely aligned with the philosophy of pragmatism. Describing the work of Tashakkori and Teddlie (2003), she stated, "pragmatism makes it possible for researchers to collect and analyze both quantitative and qualitative data within a single study to

address different aspects of the same general research problem with the aim of providing its more complete understanding" (Ivankova, 2015, p. 16). Ivankova's description of the use of quantitative and qualitative data to address different aspects of a problem aligned well with my problem of practice, that use of OER is not widespread among Ontario post-secondary educators. It was a multi-faceted problem. The use of both types of data certainly helped me achieve a research goal of providing a more complete understanding of my participants' perspectives related to this problem.

In a 2013 presentation for the Universitat Oberta de Catalunya, Anderson described four research paradigms (including a pragmatic research paradigm) and their related ontologies, epistemologies, and methods. He focused on design-based research (DBR) for the majority of his slides related to the pragmatic paradigm and described his view of the ontologies, epistemologies, and methodologies of this paradigm. Anderson's pragmatic ontologies were that "reality is the practical effect of ideas," and "truth is what is useful," and his epistemologies were that "any way of thinking/doing that leads to pragmatic solutions is useful," and "the best method is one that solves problems" (slides 40 and 54). Anderson suggested that pragmatic research paradigm methodologies included the use of mixed methods and could be either design-based research or action research. For this study, and for my practice, my assertions were:

- Ontology: truth is what is contextually useful (individually or collectively);
- epistemology: we observe and reflect on what is useful when we plan and test methods of problem solving;

- methodology: problem solving is applied, cyclical, and relies on the
  integration of quantitative and qualitative data.

Anderson and Shattuck, 2012, reviewed the progress of DBR in its first decade as a methodology, and made a clear distinction between DBR and action research relevant to the current dissertation. They acknowledged that researchers and practitioners had some difficulty differentiating action research from DBR and in the authors' description of elements that defined DBR, similarities and differences emerged. Based on Anderson and Shattuck's descriptions, I determined that DBR and my action research project were both situated in real-world educational contexts, both focused on the design and testing of an intervention, both used mixed methods, and both involved multiple iterations. Where I felt that my action research diverged, was that my study did not involve collaboration between researchers and practitioners (I was both the researcher and the practitioner), and that it was not my intention to reflect and articulate general design principles or grounded theories from my findings. My research was extremely contextualized and I had no expectations of its usefulness beyond my practice. If my findings were to become useful for others (other practitioners or educators) that usefulness would reside in their interpretations and perceptions.

In a more specific context for pragmatism and action research, Stark (2014) provided a concise review of the potential of Dewey's influence on action research, including a critical lens for situational issues of social justice. Stark contended that action research was political, and that this type of research was often a mechanism for social change grounded in peoples' actions—the actions of researchers and participants alike.

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The following quote from her work aligned well with my personal view of action research in a pragmatic context:

> AR [action research] informed by pragmatism does not demand that the project succeed in a final way or even that it be realistic in terms of the long view, just that it forward understanding and change the situation in some way for the better. In fact, deepening understanding *is* success for pragmatic inquiry (Stark, 2014, p. 98).

My intentions for this study were that it would succeed in deepening my understanding and my participants' understanding of OER, and that it might change our situations related to OER in whatever ways we defined as "better."

In addition to following Ivankova (2015) and Mertler's (2014) design advice for the study (mixed method action research) and exploring pragmatism as a philosophy (Crotty, 1998) and as a research paradigm (Anderson, 2013), Mertler (2014) highlighted the importance of establishing a plan for validity (trustworthiness) as an element of rigorous research methodology.

Trustworthiness. Mertler (2014) described trustworthiness related to qualitative data as reliant on creditability and dependability. He recommended exploring whether or not the findings of the study were accurate and believable from the perspective of participants (a process known as member checking). He also suggested that dependability in qualitative data (and associated findings) was supported by the use of multiple sources of data (also known as triangulation). Mertler also described validity and reliability as key elements of quality assurance in quantitative data collection and analysis. He recommended that quantitative instruments be critically reviewed by both experts and

potential participants to ensure that they are measuring what the researcher intends for them to measure, and that elements of the research design such as survey instruments be tested for internal consistency (reliability) to help confirm that participants are providing responses for grouped or similar items in a consistent manner.

For the purposes of this research, I preferred the term trustworthiness to validity. In my view, validity was a positivist term and implied extremely accurate, measurable evidence collected from a rigorously researched sample of a large population. Validity also implied that findings might be replicable or generalizable. I felt that my study did not have these positivist traits. For me, trustworthiness was a term that meant that I had taken care in my research design and method to follow standard practices for action research as a requirement of my degree program. It meant that I had reviewed and considered relevant existing research in the context of my explorations with participants. It also meant that I had explained and defended my design and method choices effectively for readers and committee members. Finally, trustworthiness meant that I had conducted my work ethically, with respect for the care and safety of my participants. For these reasons, I focused on trustworthiness as my quality criterion for this study and did as much as possible within my timeline and study scope to ensure it.

The choices I made in my research design were grounded in clear recommendations from well-established education research and the requirements of my program for a mixed-methods action research study. My research processes were exploratory and iterative, where qualitative and quantitative data were collected, analyzed and used to inform new cycles of exploration. The findings of the study were carefully

considered in the context of trustworthiness and the literature on open education and change management.

The following sections of this chapter describe the specifics of the setting, the participants, instruments and data sources, analytic processes, and the timeline for the study.

Setting

The geographic setting for this MMAR study was Ontario, Canada, where I live and work. During the study period, I worked for a government-funded, technology-enabled teaching and learning consortium called eCampusOntario. My practice involved supporting innovative post-secondary teaching methods with stakeholders across 45 community colleges and universities in the province. In order to narrow the scope of my intervention, I selected two Ontario universities and one Ontario college as participant institutions for my intervention. These institutions were referred to as College A, University A, and University B for the purposes of the study. Several eCampusOntario colleagues partnered with me to provide feedback on my strategies, and a group of Canadian OER advocates provided design and facilitation support for the two-week OER MOOC. These peers were key supporters in the implementation of my intervention.

Peer OER advocates with a variety of roles (instructors, instructional designers, librarians, and technology specialists) participated in the study in addition to the Ontario post-secondary educators at participant institutions. Educators—those who taught on a regular basis in post-secondary contexts, and were the decision-makers related to selection of course materials (textbooks or other required elements)—were the group that I surveyed, interviewed, and observed most closely for behavior change as part of my

intervention. At the Cycle Two data collection stage of this study, January through May 2018, approximately 17,000 university educators and academic librarians (OCUFA, n.d.) and 12,000 college educators (OPSEU, 2017) worked at post-secondary institutions in Ontario. Educators at the three participant institutions for the study, plus the Ontario educators that participated in the two-week MOOC (n = 38 total), represented a small sub-set of all Ontario educators.

Places and spaces for this study where the awareness and support strategies for use of OER were enacted included physical spaces on participant campuses (for meetings, conferences, and in-person workshops), webpages (typically Google Docs pages with resources for participants), social media spaces such as Twitter, webinar meeting spaces for virtual learning and interaction opportunities, and the OpenLearn Moodle course shell that was used to host and deliver the MOOC. The majority of data collection was conducted by distance, through electronically disseminated survey instruments, webinar interviews, questionnaires, participant journals, blogs, and discussion forum posts.

Recruitment and Participants

There were three cycles of action research for this study. Cycle 2, the final cycle was the critical period of data collection and analysis leading to completion of the dissertation.

Cycle Zero participants. As part of Cycle Zero, I attended an open education conference and sought group and individual feedback on my proposed intervention. At the Open Education Global 2017 conference in Cape Town, South Africa, I had a pre-conference opportunity to receive feedback on my dissertation proposal from peer

graduate learners ($n = 14$), and senior researchers ($n = 4$) with expertise in OER. My peers were a mix of men and women, between 25 and 50 years of age (approximately) in part-time and full-time Ph.D programs. Their research was focused on specific areas of open education and the use of OER. They were at various stages of completion in their studies. Senior researchers (two men and two women) who led the Ph.D group held terminal degrees and were all working as part of the Open University UK's research initiative, the OER Hub. The purpose of the OER Hub was to conduct global research into the use and effectiveness of open educational practices (OEP) and OER. I also recruited a BCcampus leader to participate in a one-hour interview. She was extremely familiar with the strategies used to increase use of OER, specifically open textbooks, over a five-year period in British Columbia.

Verbal consent to record and use feedback from peer graduate students was requested using an Arizona State University IRB (Institutional Research Board)-approved informed consent protocol. I facilitated a two-hour action lab as part of the Open Education Global (2017) main conference, where participants (a cross-section of all conference attendees) were asked to examine my proposed intervention for opportunities to improve it. Specific permission to collect audio recordings and to keep or photograph any session artifacts was also requested. I was invited by several graduate peers to seek continuous feedback on my intervention during the remainder of my data collection and analysis and took advantage of this opportunity.

Cycle One participants. Prior to the January 2018 launch of the first intervention for this study, I relied on a small group of peer doctoral researchers ($n = 4$) and colleagues ($n = 3$) to provide me with feedback on elements of the design. These

advocates included librarians, instructional designers, and educators. As volunteers with full-time work and personal commitments, the number of partners participating in any given task varied. Their interest in participation in my research stemmed from their own practice and graduate studies and our collaborative relationships as peers and colleagues. The role of these supporters in Cycle One involved feedback and recommendations for the design of the intervention and survey instruments to be used in Cycle Two.

Based on Ajzen's (1991) recommended survey instrument design method, during Cycle One I designed and disseminated a pilot open-ended questionnaire which would be the basis for developing a more effective quantitative TPB (theory of planned behavior) survey instrument. Participants for the open-ended pilot ($n = 7$) included four of my Arizona State University Learning Scholar Community (LSC) peers and three eCampusOntario colleagues (colleagues very familiar with OER and my Ontario context). Once the open-ended pilot was completed, I piloted the quantitative instrument, with REB (Research Ethics Board) permission, among participants at an Ontario university. I electronically disseminated the survey to an email list of 1,900 educators. I received 50 anonymous responses to this pilot instrument ($n = 50$). Data from these participants provided opportunities to examine the reliability of the instrument and analyze open-ended feedback that led to improvement of the instrument for Cycle Two of the research.

Cycle Two participants. Participants in Cycle Two, the final data collection period for this study, included $n = 10$ OER advocates and $n = 38$ post-secondary educators. There were 12 face-to-face university educators, two face-to-face college educators, and 24 MOOC participants. The face-to-face participants at College A,

University A, and University B were recruited in partnership with teaching and learning department staff, by email, using the documents included as Appendix A of this study. MOOC participants for the study were recruited through Twitter, emails to Ontario teaching and learning centres, and the eCampusOntario monthly newsletter. The informed consent protocol for MOOC participants was similar to that of face-to-face participants and was included as Appendix B. The recruitment and informed consent document for OER advocates is included as Appendix C at the end of this dissertation.

In earlier cycles of this study, and in the approved dissertation proposal, I anticipated approximately 300 educator participants. Due to REB (Research Ethics Board) approval timelines, recruitment challenges, a shift in intervention design, and an abbreviated timeline, the final number was significantly lower. There was also some attrition, as those who completed the pre-intervention survey instrument did not all complete the post-intervention instrument. Ultimately there were eight face-to-face Ontario educators who completed the intervention and the pre- and post-intervention surveys, and seven MOOC participants who engaged in the intervention and completed both survey instruments. Although there were participants in the MOOC who were not from Ontario (it was an open opportunity for any interested Canadian or global educator), I did not include their data in this study. My purpose was to explore the Ontario post-secondary context and I felt any inclusion of external-to-Ontario data was not aligned with this purpose.

There were two important departures from the approved dissertation proposal (approved in November 2017) related to participants for the study. The first was the reduction of the number of OER advocates who participated in the intervention and

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study. While I had anticipated multiple opportunities to partner with Ontario OER advocates (approximately $n = 25$), the short timelines that emerged during recruitment and intervention made it challenging for me to collaborate as much as I would have liked. Based on a shift in my intervention to the use of a MOOC, I was able to partner with 10 OER advocates on the design and delivery of the course. Their participation was critical to the success of the study, with very tight timelines for implementation of the intervention and data collection. The second departure in terms of participants was the inclusion of a MOOC (and those who participated) as part of the intervention for the study; this intervention was not part of my original research design.

Role of the researcher. As a participant in the study, I partnered with OER advocates and educators to enhance the quality and value of the intervention and the research. Relying on information gathered in Cycle One, I refined my intervention to help ensure an effective Cycle Two. I led and facilitated the work of OER advocates and conducted research and curation related to OER professional development resources. I designed and refined all survey instruments and data collection processes throughout Cycles One and Two, and conducted ongoing analysis to maintain a data-informed, cyclical action research process. In partnership with OER advocates, I coordinated, co-designed, and co-delivered the two-week MOOC. Most importantly, I engaged with participants and facilitated dialogue with and among them to gather effective and sufficient data about their perspectives, concerns, and ideas for use of OER as part of their teaching practice.

Design of the Intervention

The intervention for this study was an iteratively designed professional development series for the purpose of increasing awareness about OER and ultimately increasing use of OER among Ontario educators. The intervention included opportunities for active learning, in which participants were supported to explore how to find and share OER as part of their teaching practice. Cycle Zero and Cycle One of the action research were conducted for the purpose of gathering formative data and feedback from experienced open educators and researchers on the proposed activities and data collection instruments.

Theoretical perspectives guiding the study, specifically those set out in *Sensemaking in Organizations* (Weick, 1995), "Communities of Practice and Social Learning Systems" (Wenger, 2000), and *Diffusion of Innovations* (Rogers, 2003) were taken into consideration when making design choices for the face-to-face workshop facilitation and activities, and the content and activities of the MOOC. The "Theory of Planned Behavior" (Ajzen, 1991) informed the design of the quantitative pre- and post-intervention survey instruments.

Workshops. The first workshop, Workshop A, for face-to-face participants, was conducted with College A, University A, and University B participants. The second workshop, Workshop B, was conducted with College A and University A participants. There were not enough participants at University B to conduct a second workshop. The following descriptions were used as part of participant recruitment:

- Workshop A: "In this active, two-hour workshop, learning designer Jenni Hayman will share what she calls a sensemaking process in partnership with

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participants. The purpose of the process is to explore how educators decide on

course resources for use in their teaching, and the types of successes, outcomes,

concerns, and barriers they experience using their current resources in partnership

with students. Course resources, for the purposes of our activities and discussion,

will be textbooks, digital courseware, readings, activities, assignments, quizzes,

and exams – any of the items that educators choose and design for students to

help them achieve learning outcomes."

- Workshop B: "Following the activities of Course Resources Workshop A,

  participants will engage in explorations and designs related to finding and using

  open educational resources (OER) for their courses. They will share their work

  with each other and describe how they're beginning to make sense of the role of

  open resources in student learning, and whether or not they're finding the

  diversity of open, Internet-based choices for their teaching useful. Participants

  will learn about the differences in adopting, adapting, and creating OER, and

  determine possible future activities and resource designs for their courses."

Post-workshop webinar. A series of three post-workshop webinars were

conducted, one with a single participant from University B, one with two participants

from University A, and one with a single participant from College A. Webinars were

recorded and transcribed for qualitative analysis for the study. These webinars were

highly conversational and open-ended.

MOOC. The Making Sense of Open Education course ran for two weeks from

June 1–15, 2018. The course was hosted on the OpenLearn UK Moodle open platform.

Access to this platform was provided to me at no cost, and there was no cost for learners

to enroll and participate in the MOOC. As described in Chapter 2, MOOCs have not been widely researched as professional development experiences. However, their flexible, digital design, networked community-building potential, and my past positive experiences designing and delivering these types of courses were all well aligned with the needs of this study. The following course description was used to promote enrollment in the two-week course:

"From June 1–15, 2018, a global mini-MOOC (massive open online course) called *Making Sense of Open Education* will take place through the OpenLearn UK Moodle platform. The course will consist of short daily lessons and activities at an introductory level. The purpose of the course is to increase awareness and use of open educational resources (OER) as part of post-secondary teaching and learning. Topics will include OER, open educational practices (OEP), copyright and the Creative Commons licenses, and open tools for adaptation. A variety of experienced open educators and friends from global regions will participate and support learning and sharing opportunities. Daily lessons will take approximately 30 minutes to complete with a targeted (and hopefully fun) daily practice opportunity to apply learning. The course team and others who have already signed up look forward to your participation.

There is no cost to participate in the course. The full set of course modules will be made available on the course front page June 1 for you to download, save, and adapt as you desire if you prefer to take the course in a self-directed way."

All 14 modules of the MOOC with content and activities were made available to MOOC participants at the start of the course via the following link: https://bit.ly/2H6JdVH. Participants were invited to complete all of the MOOC

activities by June 30, 2018, with a post-intervention survey to be completed subsequently.

Even within extremely short timelines, the Twitter and email recruitment strategies for the MOOC were successful. Over 250 people enrolled in the OpenLearn course, and 92 participants completed the pre-intervention survey instrument. As noted earlier in this study, I intentionally focused my data collection on Ontario educators as this was the purpose of the study. As with most MOOCs (Daniel, 2012), there was a rapid and steady decline in participation from day one to day 15. Eventually, there were only 24 Ontario participants who remained active and completed the course.

MOOC webinars. There was a mid-MOOC webinar conducted on June 8, and a post-MOOC webinar conducted on June 15. Both webinars were recorded and transcribed for this study. These webinars were conversational and included a very open-ended facilitation protocol.

The face-to-face workshops, post-workshop webinars, the MOOC and the mid-MOOC and post-MOOC webinars were the activities of the intervention for this action research study.

Instruments and Data Sources

Cycle Zero. As part of two separate conference events in Cape Town, South Africa, I gathered qualitative data related to the study. In the first event, focused on the work of global Ph.D researchers, I used field notes to capture data during several peer-to-peer feedback sessions over two days. During an action lab session at the main conference, I sought feedback on OER awareness and use strategies, making an audio recording of a participant working group and collecting handwritten (or drawn) artifacts

by participants, plus digital materials created by participants using social media and collaborative work spaces. I conducted a semi-structured focus group session at the end of the action lab, asking the following questions:

1. As part of your work and learning in this action lab, what suggestions for improvements for my strategies or approaches would you make?

2. What strategies would you recommend I employ to attract participants to my proposed study?

In addition to collecting data with conference participants, I conducted a one-hour, semi-structured interview with a BCcampus administrator to learn more about her intervention for creating awareness of OER in British Columbia, and the effectiveness of her strategies in increasing actual use. Example questions included the following:

1. Specifically related to the BCcampus open textbook initiative, can you describe the current level of success in adoption and creation of OER?

2. How long has this initiative been in place?

3. What are the factors that have contributed to the success of the initiative?

Cycle One. Utilizing findings from Cycle Zero, I refined my intervention strategies in partnership with Cycle One participants. They included eCampusOntario colleagues and four members of my Learning Scholar Community (an ASU doctoral peer community). I designed and electronically disseminated a pilot Theory of Planned Behavior (TPB) survey with open-ended questions to inform the design of an effective quantitative pre-intervention TPB survey. Example questions included the following:

1. What factors do you take into consideration when selecting content for teaching and learning?

2. If you were interested in using OER (or more OER) in your courses, what

    supports or resources might make it easier for you?

Incorporating feedback from the open-ended pilot of the pre-intervention survey instrument, I decided to remove the subjective (social) norms construct (one of the four constructs of Ajzen's (1998) Theory of Planned Behavior). As described in the literature reviewed in Chapter 2, use of OER is considered a new practice, and OER are not well known as possible resources among Ontario educators. Pilot participants involved in refining the quantitative survey instrument (n = 7) felt that participants (Ontario educators new to OER) would not be able to effectively answer questions about what peers (or students) might think about using OER. Potential participants in the study were considered to be in the early stages of sensemaking for themselves. Pilot participants did not consider OER to be an active topic of academic conversations, and therefore felt that study participants would have little or no information to answer questions about the social norms of the behavior of those who used OER.

Based on the analysis and findings from the pilot questionnaire, I refined the full-version quantitative TPB survey instrument, and piloted it with a group of Ontario university educators (*n*=50). The final pre-intervention instrument used for the study is included as Appendix D at the end of this dissertation.

Cycle Two. Based on data collected in Cycles Zero and One, I partnered with eCampusOntario colleagues and OER advocates to plan a variety of OER-related professional development activities for the implementation of the intervention. I requested that the OER advocates complete a questionnaire that provided me with information about their motivations and goals for open advocacy and participation in this

study. The questionnaire is included as Appendix E at the end of this dissertation.

Throughout the planned activities, whether they were webinars, in-person workshops, or

within the MOOC, I observed participants, took field notes, and collected feedback from

participants.

The pre-intervention survey instrument (the final instrument created as part of

pilot processes in Cycle One) was disseminated to all educator-participants in the study

(Appendix D for the study). The pre-intervention survey instrument consisted of 42 items

in total and included contextual items intended to collect data about participant

demographics, (their title, types of learners they taught, years of teaching, gender, etc.).

Survey items included questions about the types of resources participants used in their

teaching practice, their level of access to the Internet, and their general technology skills

for teaching (self-perceived). Data analysis from these items (a form of contextual needs

analysis for each of the participant groups) informed the final design of the workshops

and the MOOC used as the interventions for the study.

The pre-intervention survey instrument also included items for the three main

constructs for the study that would be used for pre- and post-intervention comparison.

The comparison helped to determine if there were any differences in participant

responses before and after the intervention. The three constructs were "Attitude Toward

OER", "Perceived Behavioral Control "(skills needed to find and use OER), and

"Intention to Use OER". Details of the items within each construct are described in

Chapter 4 as part of the data analysis and results.

Toward the end of the data collection period, in May 2018, I designed and

disseminated the post-intervention TPB survey instrument (see Appendix F). The post-

intervention instrument was a reduced version of the pre-intervention instrument that repeated the items of the three major constructs.

To complement data collected in the pre- and post-intervention survey instruments, I conducted group interview sessions using web conferencing software and connected with educators about their experiences in workshops and in the MOOC. A list of questions discussed in these webinar sessions is included as Appendix G at the end of this dissertation. One of the webinar sessions was conducted mid-way through the MOOC (to gather formative data on participant experiences), and the second webinar was conducted to gather final thoughts and feedback on MOOC participant experiences. All webinars were recorded and transcribed for analysis.

Data Collection and Analysis

In Table 1, shown below, the data sources for Cycle Two of the study and the types of analyses used were organized in relation to the four research questions. My field notes and researcher journal reflections created throughout the study were analyzed for themes related to the research process and all four of the research questions.

Table 1

Primary Data Sources and Analyses Aligned with Research Questions for the Study

Research Question	Data Source(s) (*Analyses*)	
	1	2
How do OER advocates define their goals and motivation for the use of OER?	OER advocate intake questionnaire (*structural coding*)	MOOC discussion forum support posts (*structural coding*)
To what extent might the OER professional development experiences of this study impact educators' intention to use OER?	Face-to-face and MOOC pre-intervention survey instruments (*descriptive and frequency analyses, paired samples t-test)*	Face-to-face and MOOC participant webinars (*structural coding*)
What questions and insights about OER emerge as part of a sensemaking process among educators?	MOOC discussion forum and blog post information. Face-to-face workshop observations and field notes (*Process coding, structural coding and Word Cloud*)	Face-to-face and MOOC participant webinars and post-intervention survey (open-ended) items (*structural coding)*
In what ways might professional development related to use of OER be improved?	Face-to-face and MOOC participant webinars (*structural coding*)	Post-intervention survey (open-ended) items (*structural coding*)

Cycle Zero data collection and analysis. Data collected in Cycle Zero were qualitative data only and were gathered from peers and conference participants in the form of ideas about how to create awareness of OER. I also collected data in the form of feedback on my proposed Cycle One intervention. A variety of qualitative data sources were analyzed for information related to the awareness and support activities of the intervention. These sources included my field notes on questions and verbal feedback, conversations among peer graduate students, group work during my conference session,

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and artifacts created by conference session participants (with their consent). These data were coded by hand following a variety of practices recommended by Saldaña (2016). In particular, I used an in vivo coding method for my field notes and transcripts of audio focus groups to ensure I was capturing the advice of participants in their own words. I distilled their advice and recommendations into themes and compared the recommendations of my peers and more senior researchers with what I had learned reviewing the literature on OER. These elements, along with recommendations from the literature, provided the foundation for the design of my intervention.

Cycle One data collection and analysis. I collected a variety of data in Cycle One as outlined in the Instruments and Data Sources section above. In order to refine survey instrument items and help ensure they were aligned with Ontario educator contexts, the TPB pilot questionnaire was reviewed by three experienced OER advocates and four doctoral program peers. Data on the open-ended questions were analyzed using an *in vivo* coding method to confirm language that was specific to post-secondary educators. Once I had developed the quantitative TPB instrument, I piloted it with a group of Ontario university educators. I received 50 responses (from an REB-approved email list of approximately 1,900 participants) and engaged in a variety of quantitative analyses (including reliability analysis and a review of results from a paired samples *t*-test) to further refine the instrument for use in Cycle Two.

Cycle Two data collection and analysis. A variety of qualitative and quantitative data were collected and analyzed in Cycle Two for this study. The pre-intervention and post-intervention survey instruments were disseminated to all educator-participants at the start of the intervention. The participant groups included face-to-face participants at

College A, University A, University B, and all Ontario-educator participants from the two-week MOOC. The quantitative data from these survey instruments were analyzed using standard descriptive, frequency, and paired samples (repeated measures) t-test processes conducted with IBM® SPSS Statistics software, version 24.

There were common activities, questions, and themes in all of the workshops, and a procedure called structural coding was used as the principal analytic method for the qualitative data. Saldaña (2016) provided advice about this method of coding, observing that, "Structural Coding is question-based coding that 'acts as a labeling and indexing device" (p. 98). He described the practice of developing an initial list of codes from the research questions and the conceptual framework of the study (a pre-determined list prior to first-round analysis), applying those codes to data, and engaging in a second round of coding for themes. The OER advocates ($n = 10$) who supported the design and delivery of the MOOC agreed to complete a brief questionnaire that was also analyzed using a structural coding process. All qualitative data for the study were coded using an Internet and subscription-based qualitative organizational tool called Dedoose (www.dedoose.com). Microsoft Excel was used for post-coding organization and thematic analyses.

The MOOC provided an opportunity to gather several types of qualitative data (in addition to the quantitative pre- and post-intervention survey instruments). There were daily discussion forums during the MOOC on 14 separate topics that were designed into the course platform and tasks. In addition to posting to the discussion forums, participants also used Twitter and personal blogs to share their ideas and thoughts about the course and ask reflective questions. Due to the special nature of the MOOC, discussion forum

and blog posts were analyzed using a method called process coding. Saldaña (2016) described process coding as "appropriate for virtually all qualitative studies, but particularly for those that search for the routines and rituals of human life" (p. 111). The process coding method consists of coding small-scale excerpts (short phrases) with gerunds (-ing action words), and examining those words for patterns and frequency. As shown in Chapter 4, the process coding results for this data were used to create a word cloud using an Internet-based solution called Wordle (www.Wordle.com).

There were three post-workshop webinars with participants from College A, University A, and University B, plus mid-MOOC and post-MOOC webinars. Data from two post-intervention, open-ended questions included in the quantitative survey instrument were also analyzed as part of these post-workshop and MOOC webinar transcripts. These data were used to enhance my field notes and complement the pre- and post-intervention quantitative data gathered in surveys. A structural coding process based primarily on the structure of research question four was used to analyze these data for experiences and recommendations to improve professional development models for OER.

Procedures and Timeline

Procedures for Cycle Zero. Cycle Zero participants were recruited in March 2017 from a pool of participants attending a global open education conference, OE Global 2017. Participants included doctoral peers participating with me in a pre-conference shared research symposium. A second group of participants was recruited as part of an action lab session I conducted at the main conference. During each of these data collection opportunities, I sought permission from all participants, took notes, recorded audio, and kept or photographed artifacts they created. I ensured that those that

declined to participate in contributing data were removed from audio files, transcriptions, and their artifacts were not captured.

Procedures for Cycle One. The timeline and procedures for Cycle One ran from April 2017 to December 2017 and encompassed the following: recruitment of OER advocates (Ontario educators interested in participating in the design and development of the intervention); development of the TPB pilot questionnaire; feedback on the intervention strategies from eCampusOntario peers, doctoral peers, and OER advocates; and development of project management charts and a budget for the 2017-2018 OER awareness and support activities. Web resources for the intervention were curated, designed, and posted. I kept field notes and research notes throughout all cycles and phases for this study.

Procedures for Cycle Two. Cycle Two took place between January 2018 and June 2018, during the winter and spring phases of the Ontario post-secondary academic year. The procedures included the following tasks:

- REB approvals at College A, University A, and University B;

- recruitment of all face-to-face and MOOC participants;

- dissemination of the pre-intervention survey instrument;

- planning, design, and delivery of workshops and the MOOC;

- scheduling and recording of post-workshop webinars and mid- and post-MOOC webinars;

- dissemination of the post-intervention survey instrument;

- collection of data from the MOOC course shell and blog posts; and

- analysis of all data.

Shown in Table 2, the timeline and procedures for the study were organized

chronologically.

Table 2

Timeline and Procedures for the Study

Dates	Actions	Procedures
March–April 2017	Cycle Zero: recruited participants from the Cape Town, OE Global 2017 conference, collected session data	I collected data at conference sessions on awareness and use strategies for the proposed research. I used data from these events to refine my intervention
April–November 2017	Cycle One: planned and designed the research proposal in preparation for defense in November 2017	I recruited and interacted with eCampusOntario colleagues and OER advocates and developed a plan for the activities of the intervention (workshops and webinars). I sought input from these participants to pilot and develop the proposed pre-intervention survey instrument
December 2017	Cycle One: piloted the quantitative pre-intervention survey instrument	With REB permission from an Ontario university, I disseminated a pilot version of the pre-intervention survey instrument, tested for reliability, and refined problematic items
January–March 2018	Cycle Two: recruited participants	REB approvals were sought at each participant institution (College A, University A, and University B) and recruitment of face-to-face participants took place
April 2018 –May 2018	Cycle Two: conceived, designed, and constructed the MOOC	Based on low recruitment responses, a second intervention strategy was devised to design and deliver a MOOC in partnership with OER advocates
April–May 2018	Face-to-face workshops were delivered	Based on contextual data analysis of the pre-intervention survey, I refined the design of the workshops and delivered workshop A at College A, University A, and University B. Workshop B was also delivered

Table 2 (Continued)

Dates	Actions	Procedures
May 2018	Face-to-face webinars were scheduled and recorded	To enrich the quantitative data, observations and field notes from the workshops, three webinars were scheduled, recorded, and transcribed
June 1– June 30, 2018	MOOC and webinars were delivered	From June 1 to June 15, 2018, the live MOOC was delivered. On June 8, a mid-MOOC webinar was scheduled and recorded, and a post-MOOC webinar was scheduled and recorded on June 15
May–June 2018	All participants were encouraged to complete the post-intervention survey instrument	As soon as webinars were recorded, a series of three reminders were sent to encourage face-to-face and MOOC participants to complete post-intervention survey instruments
July– September 2018	Data organization and analysis, as well as writing and feedback on the final dissertation were accomplished	All data were collected and organized for a variety of analyses as outlined in the Data Collection and Analysis section above

Summary

The cyclical MMAR approach for the proposed study was grounded in a trustworthy method as described by Ivankova (2015) and Mertler (2014). An exploratory qualitative–quantitative sequential process allowed me to collect a variety of qualitative and quantitative data related to my intervention and its implementation through multiple iterations. Data collected in Cycle Zero and Cycle One from conference participants, experienced OEP and OER researchers, peer graduate learners, and peer learning designers provided me with guidance and feedback on my emerging intervention. Data collected from OER advocates and educators in Cycles One and Two provided me with information related to Ajzen's Theory of Planned Behavior in an OER context, as well as

iterative feedback that I used to increase the effectiveness of the OER awareness and support strategies. This iterative approach was designed to support the purpose of my mixed-method action research study, which was to determine the usefulness of an OER awareness and support strategy to increase the use of OER by educators at colleges and universities in Ontario.

CHAPTER 4

Analysis and Results

The following section includes analyses and results of the quantitative and qualitative data collected as part of Cycle Two of the mixed-methods action research design. Results from data analyses conducted in Cycle Zero and Cycle One were not included in the final dissertation as these were formative cycles of action research that were reported and assessed as part of doctoral program course work. Quantitative data from Cycle Two of the study included pre- and post-intervention survey responses from Ontario educators in both the face-to-face workshop cohort (including participants from University A, University B, and College A), and the MOOC (massive open online course) cohort (a mix of Ontario college and university educators). Qualitative data for Cycle Two included responses from both face-to-face and MOOC participants, responses from the OER (open educational resource) advocates, and researcher notes.

Each cohort for the study was relatively small, with a face-to-face cohort of $n = 14$ and a MOOC cohort of $n = 24$. The recruitment strategies, self-selection opportunities, and intervention paradigms were different for each cohort; therefore, a two-cohort, parallel approach to quantitative and qualitative analysis was used. This strategy was followed throughout this chapter.

Before setting out on my analysis and discussion of results, it is worth restating the research questions for the study:

1. How do OER advocates define their goals and motivation for the use of OER?
2. To what extent might the OER professional development experiences of this study impact educators' intention to use OER?

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3. What questions and insights about OER emerge as part of a sensemaking process among educators?

4. In what ways might professional development related to use of OER be improved?

The pre-intervention survey (completed by both cohorts) contained 29 questions pertaining to participant demographics, the types of resources they used in their teaching, the criteria they used to select traditional course resources, their level of technical experience, and the types of open resources they used or wanted to learn more about. These contextual items supported the iterative design of the interventions. Participant responses were reviewed in advance of the first workshops and the first day of the MOOC for specific information about their behaviors and preferences.

The pre-intervention survey instrument also contained 13 items for the three main constructs of the study based on Ajzen's (1991) Theory of Planned Behavior. These items were described in detail in the Quantitative Analysis of the Three Major Constructs section of this chapter.

General Quantitative Analysis

There were seven sections of the pre-intervention survey instrument, entitled:

- Introduction to the Research (consent information);

- About You;

- About Course Resources;

- Factors in Decision-Making;

- Open Educational Resources (OER);

- Technology Related to Selecting Course Resources; and

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- Use of Open Educational Resources (OER)

These sections were used to organize the analyses in this chapter. Unless otherwise indicated, all quantitative analyses in the face-to-face cohort consisted of $n = 14$ responses, and all quantitative analyses of the MOOC participants consisted of $n = 24$ responses.

In the About You section of the pre-intervention survey instrument, items related to participant demographics were included. There was a total of 14 participants from University A, University B, and College A. With respect to types of institutions, 12 of the participants taught at four-year universities, and two of the participants taught at two-year colleges. Six of them taught exclusively in face-to-face classrooms, and eight taught both face-to-face courses and online courses (dual mode teaching). Participants taught a variety of subjects, including English and communications, education, history, accounting, engineering, massage therapy, music, and public health. On average, participants had between 11 and 15 years of experience in their practice.

In their About You responses for survey items, MOOC participants from Ontario also provided demographic details. There were 17 two-year college participants, and seven four-year university participants. In terms of teaching mode, 10 of the participants taught face-to-face only, one of the participants taught online only, and 13 participants taught in dual mode (some courses face-to-face and some courses online). There was variation in subjects taught, for example general education, linguistics, math, information literacy, web design, computer science, biology, and criminology. On average, these participants also had between 11 and 15 years of teaching experience.

The About Course Resources section of the pre-intervention survey instrument contained several items, including participant decision-making autonomy, the types of teaching resources participants typically used, and the criteria they used to decide on resources. Among the face-to-face participants, 12 were solely responsible for course resource decisions; two others were members of teams that made such decisions.

MOOC participants responded to the question of decision-making autonomy with a wider variety of roles than the face-to-face cohort. MOOC participant responses for the pre-selected list of options and the frequency of participant responses are shown in Table 3. An important difference between the face-to-face and MOOC participants emerged in this analysis. Just over 30% of the latter (eight of 24) had no decision-making power (authority) to select course resources. A higher percentage of MOOC participants were two-year college instructors (17 of 24) and this might have been a factor in this difference.

Table 3

Frequencies of MOOC Participant Decision-Making Authority for Course Resources[a]

Responsibility level for resource selection	Number of participants
I am solely responsible for the selection	13
I lead a group that makes the selection	1
I am a member of the group that makes the selection	2
I influence the selection, but do not have decision-making power	4
Others make the selection, I have no role	4

[a]*n*=24

Participants in the MOOC cohort responded to the follow-up question for this group of items: "If you do not choose the primary course resources for your course, who

has that decision-making authority for your course?" Their responses named a program or course coordinator and a subject matter expert. Decision-making authority over course resources influenced the design of the intervention for MOOC participants. Specifically, the content for the MOOC included ideas for finding and using OER as supplemental resources, and dialogue was designed with the possibility that participants might not have course resource decision-making power.

The list of items relevant to the types of resources participants used in their teaching was based on a pre-selected list (reviewed and refined by pilot experts in post-secondary teaching) and organized in Tables 4 and 5. Participants were invited to select all resources that applied in their teaching practice, and to add other options.

Table 4

Course Resources Used by Face-to-Face Participants[a]

Resource	Number of participants using the resource
Web pages (links to external websites)	14
Videos (YouTube or other external provider)	13
Images found using Google search	10
Journal articles with library access	10
Open Access journal articles	9
Standard publisher textbook (hard copy, student-purchased)	8
Standard publisher textbook (eText, student-purchased)	5
Videos specific to course (hosted at participant's institution)	5
Images from a stockphoto provider	4
Publisher assessment (student-purchased)	3
Images from campus library	2
Publisher simulation (student-purchased)	2
Other – Open access textbooks	2
Other – Blog sites	1
Other – Recordings (both online and on CD)	1

[a]*n*=14

There were no differences between face-to-face participants and MOOC participants in terms of the top five resources used (web pages, videos, images, journal articles, and open access articles) and very few differences in the balance of the lists. It was particularly relevant in the context of encouraging adoption of OER that 13 of 14 face-to-face participants used either hard copy or eText student-purchased publisher books (93%), and 17 of 24 MOOC participants used these student-purchased resources (71%). Knowledge of these preferences among participant cohorts helped to frame conversations and areas of focus for the interventions of the study.

Table 5

Course Resources Used by MOOC Participants[a]

Resource	Number of participants using the resource
Web pages (links to external websites)	24
Videos (YouTube or other external provider)	23
Images found using Google search	20
Journal articles with library access	15
Open Access journal articles	13
Standard publisher textbook (hard copy, student-purchased)	13
Videos specific to course (hosted at participant's institution)	11
Images from a stockphoto provider	10
Images from campus library	7
Standard publisher textbook (eText, student-purchased)	4
Publisher assessment (quizzes, practice exams, student-purchased)	4
Institutional simulation	4
Publisher simulation (student-purchased)	1
Other – Government publications	2
Other – Open textbook	2
Other – In-house created content	1

[a]*n*=24

In the Factors in Decision Making section of the survey instrument, participants were asked to rate a list of criteria that might affect their decision-making when selecting course resources. Tables 6 and 7 list the criteria and mean participant responses based on a four-item Likert-type scale as follows: 1 = Not Important; 2 = Somewhat Important; 3 = Important; and 4 = Very Important. For this analysis, the closer the mean was to 4.00, the higher the level of importance was for the participants. Standard deviations for each of the means are included in parentheses.

Table 6

Means and Standard Deviations for Assessing Factors in Face-to-Face Participant Course Resource Decision-Making (Rated for Importance)[a]

Factors in decision-making	Level of importance: means (standard deviations)
Quality of the resource	3.93 (0.27)
The resource is relevant to my topics	3.64 (0.50)
Cost of the resource	3.43 (0.75)
The resource is current	2.86 (0.86)
The resource is comprehensive	2.78 (.097)
Publisher of the resource	2.29 (1.07)
External colleagues recommend the resource	2.21 (0.80)
Instructor resources are included	2.14 (1.17)
Supplemental resources for students are included	2.08 (0.86)
My colleagues recommend the resource	2.07 (0.73)
A librarian recommends the resource	1.86 (0.86)
My department lead recommends the resource	1.64 (0.63)

[a]*n*=14

Face-to-face participants' means indicated that they felt three criteria were most important: the quality of the resource; relevance for course topics; and the cost of the

resource. For MOOC participants, five criteria were important: the quality of the

resource, its relevance, the cost of the resource, whether or not the resource was

comprehensive, and whether or not it was current. Based on a means analysis of

responses, neither face-to-face nor MOOC participants felt that the publisher of a

resource was important, and neither cohort indicated that the opinions of others were

important in their decision-making processes. These results provided useful elements for

subsequent conversations with both cohorts regarding their potential concerns about the

quality of OER and how to search for and explore resources that met the currency,

relevance, and comprehensiveness standards they were seeking.

Table 7

Means and Standard Deviations for Assessing Factors in MOOC Participant Course

Resource Decision-Making (Rated for Importance)[a]

Factors in decision-making	Level of importance: means (standard deviations)
Quality of the resource	3.82 (.039)
The resource is relevant to my topics	3.56 (0.51)
Cost of the resource	3.43 (0.66)
The resource is comprehensive	3.30 (0.70)
The resource is current	3.17 (0.78)
Publisher of the resource	2.48 (0.90)
My colleagues recommend the resource	2.39 (0.72)
My department lead recommends the resource	2.27 (0.88)
Supplementary resources for students are included	2.18 (0.96)
A librarian recommends the resource	2.18 (0.90)
External colleagues recommend the resource	2.13 (0.69)
Instructor resources are included	2.13 (0.92)

[a]*n*=24

As part of the Open Educational Resources (OER) section, participants were asked if this survey was the first time they had encountered the term open educational resources (OER) formally defined. All 14 face-to-face participants indicated that they had heard the term before, in various contexts, including institutional workshops, in conversation with colleagues, through academic reading, and at education conferences. Among MOOC participants, 21 of 24 indicated that they had heard the term previously, and in similar contexts to those reported by face-to-face participants—in conversations, through reading, and at conferences. This information helped to set levels of expectation for the interventions in terms of prior knowledge among participants regarding OER.

Participants were asked to select types of OER used in their practice as an item in the Open Educational Resources (OER) section. The pre-determined list and the number of participants who indicated they used the resource in their teaching are provided in Tables 8 and 9.

Table 8

OER Used by Face-to-Face Participants[a]

Open resource	Number of participants
Images with an open license (Creative Commons or other)	12
Open access journal articles	9
Videos labeled with Creative Commons license	9
Open textbook	4
Open data	3
Open simulations	1
I do not use open educational resources	1

[a]*n*=14

Both face-to-face and MOOC participants reported that their most frequently used resources were openly licensed images, open access journal articles, videos labeled with Creative Commons licenses, and open textbooks. These items were very similar to the types of general resources that each cohort identified in tables 4 and 5 and were considered the primary areas of resource focus for applied practice during interventions.

Table 9

OER Used by MOOC Participants [a]

Open resource	Number of participants
Images with an open licenses (Creative Commons or other)	18
Videos labeled with Creative Commons license	18
Open access journal articles	16
Open textbook	8
Open simulations	2
I do not use open educational resources	2
Open data	1

[a]*n*=24

In the Technology Related to Course Resources section of the survey, participants were asked to identify the ways in which they had accessed the Internet over the past year, and the types of technology they had used. These factors were deemed less important than participants' overall confidence using technology, and their confidence in using OER specifically. Tables 10 and 11 reveal participants' self-rated levels of confidence in conducting specific technology-related education tasks, by cohort. For these survey items, a four-point Likert scale was used as follows: 1 = Strongly Disagree; 2 = Disagree; 3 = Agree; and 4 = Strongly Agree.

Table 10

Means and Standard Deviations for Assessing Face-to-Face Participant Confidence in

Conducting Technology-Related Tasks[a]

Confidence statement	Level of confidence: means (standard deviations)
I am confident conducting web-based research to find course resources	3.50 (0.52)
I am confident sharing digital resources with learners	3.43 (0.51)
I am confident using the tools of my institution's learning management system (LMS)	3.28 (0.91)
I am confident leading students to find and share digital resources	3.28 (0.61)
I understand my institution's policies related to copyright of course material	3.07 (0.73)
I am confident creating audio, video, or other media for my course(s)	2.78 (0.89)

[a]*n*=14

Analysis of these items for the face-to-face cohort indicated that among

participants, mean confidence levels for finding and sharing Internet-based resources

with learners, and conducting most search and share tasks, were relatively high. As a

group, participants indicated lower levels of confidence in their understanding of

copyright and institutional policies related to resources, and they indicated that they were

not confident in their capacity to create media.

For the MOOC cohort, overall confidence levels were somewhat lower. However,

MOOC participants were slightly more confident in their ability to create and share

media with learners. These levels of confidence were taken into account as part of the

design of interventions. Methods for searching for easily adopted, pre-designed media

became a content focus for the face-to-face cohort, and methods for finding and sharing

small-scale resources with learners (supplemental choices), as well as copyright and open

licenses, were integrated for both cohorts.

Table 11

Means and Standard Deviations for Assessing MOOC Participant Confidence in

Conducting Technology-Related Tasks[a]

Confidence statement	Level of confidence: means (standard deviations)
I am confident using the tools of my institution's learning management system (LMS)	3.37 (0.71)
I am confident conducting web-based research to find course resources	3.16 (0.82)
I am confident sharing digital resources with learners	3.08 (0.77)
I am confident creating audio, video, or other media for my course(s)	3.04 (0.81)
I am confident leading students to find and share digital resources	2.95 (0.80)
I understand my institution's policies related to copyright of course material	2.82 (0.57)

[a]*n*=24

The list of potential open resources that participants might wish to learn more

about, and those that were most frequently selected, were included for both cohorts as

Tables 12 and 13. Participants were invited to select any of the resources that interested

them.

Table 12

Types of OER Face-to-Face Participants Want to Learn More About[a]

Open resource	Number of participants
Open textbook	5
Videos labeled with Creative Commons license	4
Images with an open license (Creative Commons or other)	3
Open simulations	4
Open access journal articles	2
Open data	2

[a]$n=14$

Results for both face-to-face and MOOC participants were very similar, with open textbooks, openly licensed images, open simulations, and open access journal articles of the greatest interest. Knowledge of participant preferences and the consistency of these resource types among both cohorts throughout these contextual items in the survey instrument were very useful in the design of the interventions.

Table 13

Types of OER MOOC Participants Want to Learn More About[a]

Open resource	Number of participants
Open textbook	21
Videos labeled with Creative Commons license	17
Images with an open licenses (Creative Commons or other)	17
Open simulations	17
Open access journal articles	16
Open data	16
Other – Open online modules	1

[a]$n=24$

Reliability of the Survey Instrument for Three Major Constructs

As a measure for internal consistency, a Cronbach alpha analysis was conducted to determine whether the three major constructs of the pre-intervention survey instrument reliably measured what they were intended to measure. The three constructs, based on Ajzen's (1991) Theory of Planned Behavior, were "Attitude Toward OER," "Perceived Behavioral Control" (skills for finding and using OER), and "Intention to Use OER." The items included in each construct were rated using a four-point Likert scale, with 1 = Strongly Disagree, 2 = Disagree, 3 = Agree, and 4 = Strongly Agree. Item statements for each construct were as follows:

Attitude Toward OER (six items)

- OER are easy to find in my discipline

- There are many high-quality OER in my discipline

- I believe OER add value to the spectrum of resources available in my discipline

- I am likely to use OER in my courses

- I have used OER in my courses

- I would recommend the use of OER to other educators

Perceived Behavioral Control (three items)

- I am confident searching the Internet for OER for my courses

- I understand open licenses such as Creative Commons

- I am confident citing and attributing OER in my course(s)

Intention to Use OER (four items)

- I will explore OER related to my courses within the next 3–6 months.

- I will discuss use of OER with colleagues in the next 3–6 months

- I intend to participate in professional learning about OER if it is offered at my institution

- I intend to experiment with OER in my courses in the next 3–6 months

According to the UCLA Institute for Digital Research and Education (IDRE, n.d.), "Cronbach's alpha is a measure of internal consistency, that is, how closely related a set of items are as a group. It is considered to be a measure of scale reliability" (para. 1). While IDRE indicates that a reliability coefficient of .70 or higher (up to a maximum of 1.0) is acceptable, an ideal reliability coefficient is described as closer to .90. For the present study, the three constructs and the reliability coefficient for each are organized in Tables 14 and 15 (one for face-to-face participants and one for MOOC participants). The three constructs and specific items within each one were repeated verbatim in the post-intervention instrument, so a second reliability analysis for post-intervention survey responses was deemed unnecessary.

Table 14

Reliability of Three Constructs for Face-to-Face Participants[a]

Construct	Reliability coefficient
1. *Attitude Toward OER*	.93
2. *Perceived Behavioral Control* (skills for using OER)	.89
3. *Intention to Use OER*	.87

[a]*n*=14

For the face-to-face participants, the Attitude About OER construct was rated most reliable in the analysis at .93. Constructs 2 and 3 also scored well at just under .90. The low number of participants might have had an effect on reliability measures, and may be considered a limitation of the analysis, but these results were considered acceptable findings for reliability according to commonly articulated measures.

The MOOC participant results for the reliability measures were also centered firmly in the acceptable range with .88, .91, and .86 for constructs 1, 2, and 3 respectively.

Table 15

Reliability of Three Constructs for MOOC Participants[a]

Construct	Reliability coefficient
1. *Attitude Toward OER*	.88
2. *Perceived Behavioral Control* (skills for using OER)	.91
3. *Intention to Use OER*	.86

[a]*n*=24

Quantitative Analysis of the Three Major Constructs

Pre-intervention analyses. The major constructs for the pre-intervention survey instrument were embedded in the 42 survey instrument items. However, for purposes of analysis and comparison, they were presented in this section as a series. Items for the first construct*,* Attitude Toward OER, were rated by participants using a four-point Likert scale with an additional option as follows: "I am not familiar enough with OER to answer this question." Participants that selected the "not familiar" option were assigned a zero for purposes of calculating the mean for these items. Items were rated by participants, where 1 = Strongly Disagree, 2 = Disagree, 3 = Agree, and 4 = Strongly Agree. Shown in

Tables 16 and 17 are the items and mean participant responses for this construct for face-to-face and MOOC participants.

Table 16

Means and Standard Deviations for Assessing Face-to-Face Participants' Attitudes Toward OER[a]

Attitude statement	Level of agreement: means (standard deviations)
I am likely to use OER in my courses	3.21 (1.12)
I would recommend the use of OER to other educators	3.00 (1.47)
I have used OER in my courses	3.00 (1.30)
I believe OER add value to the spectrum of resources available in my discipline	2.93 (1.38)
OER are easy to find in my discipline	2.00 (1.11)
There are many high-quality OER in my discipline	1.71 (1.27)

[a]*n*=14

With the line between agreement and disagreement for this construct set at 3.00, face-to-face participants did not demonstrate high levels of agreement generally. They were somewhat likely to use OER in their courses. They did not agree that that OER were easy to find in their discipline. As a group, they also disagreed that OER added value to their discipline, and they did not believe that there were many high-quality OER available. MOOC participants reported slightly higher levels of agreement than their face-to-face peers, indicating that they would recommend OER to colleagues, that they were likely to use them, and that they believed OER added value to their discipline. However, MOOC participants also disagreed that OER were easy to find, and did not believe that there were many high-quality options. These baseline measures of participants' pre-intervention attitudes presented several opportunities during the interventions to discuss areas of concern.

Table 17

Means and Standard Deviations for Assessing MOOC Participants' Attitudes Toward

OER[a]

Attitude statement	Level of agreement: means (standard deviations)
I would recommend the use of OER to other educators	3.29 (1.33)
I am likely to use OER in my courses	3.17 (1.34)
I believe OER add value to the spectrum of resources available in my discipline	3.08 (1.47)
I have used OER in my courses	2.87 (0.90)
There are many high-quality OER in my discipline	1.95 (1.43)
OER are easy to find in my discipline	1.79 (1.25)

[a]*n*=24

Face-to-face and MOOC participant responses for the second construct of the study, Perceived Behavioral Control, or confidence in the skills required to find and use OER, are shown in Tables 18 and 19. Similar to the first construct of this study, Attitude Toward OER, items in this second construct included the option for participants to select "I am not familiar enough with OER to answer at this time," and "I am not familiar enough with Creative Commons to answer at this time." If participants selected these options, their responses were left out of mean calculations. For this survey item, a four-point Likert scale was used as follows: 1 = Strongly Disagree; 2 = Disagree; 3 = Agree; and 4 = Strongly Agree.

Table 18

Means and Standard Deviations for Assessing Face-to Face Participants' Perceived

Behavioral Control Related to OER[a]

Confidence statement	Level of agreement: means (standard deviations)
I am confident searching the Internet for OER for my course(s)	2.93 (0.92)
I understand open licenses such as Creative Commons	2.93 (0.92)
I am confident citing and attributing OER in my course(s)	2.86 (0.95)

[a]$n=14$

Neither face-to-face nor MOOC participant means indicated agreement with the

items of this construct. Face-to-face participants had slightly higher levels of confidence

than their MOOC peers, but did not rise above the 3.00 threshold for agreement. This was

important information for the design of the interventions in terms of supporting

participants in both cohorts to increase their overall knowledge of the technical tasks

involved in finding and using OER.

Table 19

Means and Standard Deviations for Assessing MOOC Participants' Perceived

Behavioral Control Related to OER[a]

Confidence statement	Level of agreement: means (standard deviations)
I understand open licenses such as Creative Commons	2.75 (1.07)
I am confident I have supports at my institution to find and use OER	2.58 (1.02)
I am confident citing and attributing OER in my course(s)	2.50 (1.02)

[a]$n=24$

Tables 20 and 21 are designed to show face-to-face and MOOC participant mean

responses for items for the construct Intention to Use OER. This was the third and final

quantitative construct for the study.

Table 20

Means and Standard Deviations: Assessing Face-to-Face Participants' Intention to Use

OER[a]

Intention statement	Level of agreement: means (standard deviations)
I will explore OER related to my courses	3.57 (0.64)
I intend to participate in professional learning about OER if it is offered at my institution	3.43 (0.51)
I intend to experiment with OER in my courses	3.36 (0.63)
I will discuss use of OER with colleagues	3.00 (0.88)

[a]*n*=14

Face-to-face and MOOC participants indicated agreement across all of the items

for this construct, but MOOC participants seemed to agree more strongly about their

intention to discuss OER with colleagues. This was a subtle difference and was taken as a

positive sign at the beginning of the interventions that participants already intended to use

OER.

Table 21

Means and Standard Deviations: Assessing MOOC Participants' Intention to Use OER[a]

Intention statement	Level of agreement: means (standard deviations)
I will discuss use of OER with colleagues	3.54 (0.66)
I intend to participate in professional learning about OER if it is offered at my institution	3.54 (0.51)
I will explore OER related to my courses	3.50 (0.51)
I intend to experiment with OER in my courses	3.46 (0.72)

[a]*n*=24

Post-intervention analyses. In order to provide comparison data between the pre-intervention and post-intervention survey instruments for all participants, the following analyses of the three constructs are provided, based on data from the post-intervention survey instrument. Among the face-to-face participants ($n = 14$) only six responded to both the pre- and post-intervention survey instruments ($n = 6$), leaving a relatively small number for analysis. While several attempts were made to encourage participants to complete surveys, attrition for this task occurred in the two weeks between workshop B and the post-intervention webinars.

MOOC participants also demonstrated attrition from pre-intervention survey responses ($n = 24$) to post-intervention responses ($n = 8$). This attrition might have occurred because of the overall length of the MOOC (15 days) and the small number of MOOC participants who ultimately completed all activities and assignments.

Tables 22 and 23 describe both the pre-intervention and post-intervention mean responses and standard deviations for Attitude Toward OER. This side-by-side comparison provided one snapshot of the participant intervention-related shift in the three main constructs. To ensure as accurate a comparison as possible, only the pre-intervention data for those participants who completed both the pre- and post-intervention survey instruments are included here. For example, the number of face-to-face participants included in the quantitative analysis tables above this section were $n = 14$, and the MOOC participants were $n = 24$. In this comparison section face-to-face participants were $n = 6$, with MOOC participants $n = 8$. For all major constructs, responses were based on a four-item Likert scale as follows: 1 = Strongly Disagree; 2 = Disagree; 3 = Agree; and 4 = Strongly Agree.

Table 22

Means and Standard Deviations for Assessing Face-to-Face Participants' Attitudes

Toward OER: Pre- and Post-Intervention[a]

Attitude statement	Pre-level of agreement: means (standard deviations)	Post-level of agreement: means (standard deviations)
I am likely to use OER in my courses	3.67 (0.52)	3.83 (0.41)
I would recommend the use of OER to other educators	3.17 (1.60)	3.67 (0.52)
I believe OER add value to the spectrum of resources available in my discipline	3.00 (1.55)	3.67 (0.52)
I have used OER in my courses	3.17 (1.60)	3.50 (0.55)
OER are easy to find in my discipline	1.67 (0.82)	2.00 (0.62)
There are many high-quality OER in my discipline	1.17 (0.98)	1.50 (1.38)

[a]*n*=6

Face-to-face participants continued to agree that they were likely to use OER in their courses after participating in the intervention. With respect to recommending the use of OER to other educators and OER adding value for their discipline, face-to-face participants indicated a +0.50 or higher positive shift from pre- to post-intervention mean responses. MOOC participants showed strong levels of agreement that they would recommend OER to other educators, and an important positive increase in their mean agreement that OER added value to their discipline (+0.63). Both cohorts continued to disagree (overall) with the statements that OER were easy to find, and that there were many high-quality OER in their disciplines.

Table 23

Means and Standard Deviations for Assessing MOOC Participants' Attitudes Toward

OER: Pre- and Post-Intervention[a]

Attitude statement	Pre-level of agreement: means (standard deviations)	Post-level of agreement: means (standard deviations)
I would recommend the use of OER to other educators	3.75 (0.46)	3.88 (0.35)
I believe OER add value to the spectrum of resources available in my discipline	3.12 (1.36)	3.75 (0.46)
I am likely to use OER in my courses	3.50 (0.53)	3.63 (0.52)
I have used OER in my teaching	3.00 (0.53)	3.13 (0.35)
There are many high-quality OER in my discipline	1.62 (1.30)	2.88 (0.83)
OER are easy to find in my discipline	1.62 (1.30)	2.63 (0.92)

[a]*n*=8

Pre- and post-intervention data for both cohorts for the second construct,

Perceived Behavioral Control were shown in Tables 24 and 25. Responses were rated on

a four-item Likert scale as follows: 1 = Strongly Disagree, 2 = Disagree, 3 = Agree, and 4

= Strongly Agree.

Table 24

Means and Standard Deviations for Assessing Face-to-Face Participant-Perceived

Behavioral Control: Pre- and Post-Intervention Results[a]

Confidence statement	Pre-level of agreement: means (standard deviations)	Post-level of agreement: means (standard deviations)
I understand open licenses such as Creative Commons	3.17 (0.75)	3.33 (0.52)
I am confident searching the Internet for OER for my course(s)	3.00 (0.89)	3.00 (0.63)
I am confident citing and attributing OER in my course(s)	3.00 (0.89)	3.00 (0.00)

[a]*n*=6

Although both cohort means demonstrated agreement for items in this construct,

MOOC participants' mean responses demonstrated important positive gains from pre- to

post-intervention in perception of their skills for finding and using OER. Face-to-face

cohort participant means were nearly unchanged from pre- to post-intervention. There

were significant applied practice opportunities designed as part of the MOOC that were

impractical to explore in the short time available for the face-to-face workshops. This

difference in time on task might have accounted for the contrast between cohorts for this

particular construct.

Table 25

Means and Standard Deviations for Assessing MOOC Participant-Perceived Behavioral Control: Pre- and Post-Intervention Results[a]

Confidence statement	Pre-level of confidence: means (standard deviations	Post-level of confidence: means (standard deviations)
I understand open licenses such as Creative Commons	2.37 (1.19)	3.50 (0.53)
I am confident searching the Internet for OER for my course(s)	2.37 (1.06)	3.25 (0.46)
I am confident citing and attributing OER in my course(s)	2.37 (0.92)	3.25 (0.46)

[a]*n*=8

The third, and final construct examined in the post-intervention survey instrument was Intention to Use OER. Face-to-face and MOOC participant responses (means and standard deviations) for the four items in this construct are detailed in Tables 26 and 27. Responses were rated on the four-item Likert scale as follows: 1 = Strongly Disagree, 2 = Disagree, 3 = Agree, and 4 = Strongly Agree.

Table 26

Means and Standard Deviations for Assessing Face-Face Participants' Intentions to Use

OER: Pre- and Post-Intervention[a]

Intention statement	Pre-level of agreement: means (standard deviations)	Post-level of agreement: means (standard deviations)
I will explore OER related to my courses	3.67 (0.52)	3.67 (0.52)
I intend to participate in professional learning about OER if it is offered at my institution	3.50 (0.55)	3.50 (0.83)
I intend to experiment with OER in my courses	3.33 (0.52)	3.50 (0.83)
I will discuss use of OER with colleagues	3.17 (0.98)	3.50 (0.55)

[a]*n*=6

Face-to-face and MOOC participant agreement means were very similar for the items in this final construct. Both cohorts tended toward Strongly Agree for all items related to intention. The lowest mean (although still in the Agree range) was MOOC participants' agreement that they would discuss OER with colleagues. Intention to Use OER, as a construct for all participants in the study, began and remained at a high level.

Table 27

Means and Standard Deviations for Assessing MOOC Participants' Intentions to Use

OER (Post-Intervention)[a]

Intention statement	Pre-level of agreement: means (standard deviations)	Post-level of agreement: means (standard deviations)
I intend to participate in professional learning about OER if it is offered at my institution	3.75 (0.46)	3.88 (0.35)
I intend to experiment with OER in my courses	3.62 (0.74)	3.75 (0.46)
I will explore OER related to my courses	3.50 (0.53)	3.63 (0.52)
I will discuss use of OER with colleagues	3.50 (0.75)	3.38 (0.74)

[a]*n*=8

Pre- and post-intervention comparisons. The final quantitative analysis for

face-to-face and MOOC participants was a repeated measure (paired samples) *t*-test to

determine if there was a significant difference in means between the pre-intervention and

post-intervention responses. This test was limited to the three constructs for the study,

Attitude About OER, Perceived Behavioral Control, and Intention to Use OER.

Construct 1 consisted of six items related to participants' Attitudes Toward OER.

Construct 2 consisted of three items related to participants' Perceived Behavioral Control,

and Construct 3 consisted of four items related to participants' Intention to Use OER.

Items in each construct were added (summed) prior to the paired samples *t*-test with the

following maximum values: Construct 1 = maximum value of 24.00; Construct 2 =

maximum value of 12.00; and Construct 3 = maximum value of 16.00. Shown in Tables

28 and 29 are the results of the pre-intervention and post-intervention comparisons for

both cohorts.

For this paired samples *t*-test (also known as a repeated measures *t*-test), the

critical element for comparison was the significance of the mean difference from pre- to

post-intervention for each of the three constructs. Significance in a paired samples *t*-test

(as represented by the Sig. (2-tailed) column) is indicated when p < .05.

Table 28

Results from the Pre- and Post-Intervention Paired Samples t-test for Face-to-Face

Participants[a]

Construct	Means (std. dev.)	*t*	df	Sig. (2-tailed)
Attitude pre-intervention	15.83 (2.51)	-.713	5	.508
Attitude post-intervention	18.17 (1.22)			
Perceived behavioral control	9.17 (2.14)	-.155	5	.883
Perceived behavioral control	9.33 (0.82)			
Intention pre-intervention	13.67 (2.25)	-.361	5	.733
Intention post-intervention	14.17 (2.56)			

[a]*n=6*

In each of the three constructs for the face-to-face cohort, there was no

statistically significant difference between pre- and post-intervention means. This was

likely due to the very low number of participants for comparison, *n* = 6. For MOOC

participants, the Perceived Behavioral Control construct demonstrated a paired samples *t*-

test result of significant difference from pre- to post-intervention mean responses. It was

clear from the positive mean difference (from a pre-intervention mean of 7.12 to a post-

intervention mean of 10.00, so nearly three points), that there was an important positive

shift in MOOC participant confidence in their skills. There were other positive changes

among individual participants in both cohorts that were described and discussed in

Chapter 5.

Table 29

Results from Pre- and Post-Intervention Paired Samples t-test for MOOC Participants[a]

Construct	Mean (*std. dev.*)	*t*	df	Sig. (2-tailed)
Attitude pre-intervention	16.62 (1.24)	-.1.757	7	.122
Attitude post-intervention	19.87 (0.77)			
Perceived behavioral control	7.12 (0.99)	-2.904	7	.023*
Perceived behavioral control	10.00 (0.42)			
Intention pre-intervention	14.37 (0.73)	-.370	7	.722
Intention post-intervention	14.62 (0.65)			

[a]*n*=8, *p < 0.05 indicates significant finding

Face-to-face Participants' Qualitative Data

Qualitative data from face-to-face participants were collected in a variety of ways.

While the face-to-face intervention (with two workshops and one webinar component)

was designed to encourage semi-structured conversation, the facilitation of activities for

each session was designed as a guided pathway based on recommendations from the

literature on sensemaking (Weick et al., 2005; Kezar, 2013). There were common

activities, questions, and themes in all of the workshops and webinars, and a qualitative

analysis called structural coding was used as the principal analytic method. It is useful to

recall Saldaña's (2016) advice about this method of coding: "Structural Coding is

question-based coding that 'acts as a labeling and indexing device'" (p. 98). He also

described a process that was used for this coding which involved developing an initial list

of codes, determined in advance of data analysis, to help ensure codes were aligned with

the research questions and conceptual framework of the study. The OER advocates (*n* =

10) who supported the design and delivery of the MOOC agreed to complete a brief questionnaire that was also analyzed using a structural coding process.

Workshops. During workshops A and B, notes and field notes about the activities and participant responses were composed. Specific to the activities and sensemaking design of the workshops, a list of structural codes was created that was grounded in research question three: "What questions and insights about OER emerge as part of a sensemaking process among educators?" The results of the analysis, including frequency of the structural codes, are shown in Table 30. The unit of analysis for coding (the excerpt) was either a phrase or sentence selected from researcher notes or field notes (observations during the workshops). There were 190 excerpts selected for coding in the first cycle. A second cycle coding process was completed based on the excerpts to identify the most common themes within the structural codes.

Table 30

Structural Codes and Themes Derived from Analysis of Face-to-Face Participant

Workshop Data[a]

Structural code	Frequency	Themes
Insight	56	Textbook costs, quality assurance, opportunities, time
Obstacle	27	Finding OER aligned with student needs, quality assurance, resistance from colleagues, finding time, support, quality of technology
Motivation	22	Better pedagogy, textbook savings, access for more learners, student empowerment
Goal	17	Finding OER, creating OER, connecting with others, adaptation, possibilities
In Vivo	17	Unique examples
Concern	15	Technology challenges, student skills, loss of control
Question	6	Understanding open licenses, quality assurance
Outlier	4	Unique examples

[a]*n*=14

Based on the themes assigned in second cycle coding, a series of three concepts

emerged as the most important elements for the face-to-face participants:

- Concept 1: Textbook costs are a key driver for use of OER;

- Concept 2: Quality assurance of OER is an important issue; and

- Concept 3: Educators desire professional development and support to improve

  their skills for finding and using OER.

There were several comments from participants related to these three concepts, and

outliers from the analysis were also deemed important as elements that rested outside of

the structural coding. There were two good examples of responses from field notes:

"I asked the participant if he felt that a steep decline in the number of students

purchasing textbooks [his observation] was impacting their learning success. He

replied, 'Most certainly'."

"Use of OER presents the possibility of attracting higher numbers of lower

income students to participate in post-secondary education."

Related to the second important concept, that of quality assurance, notes from participant

observations provided the following:

"I read a textbook and review it myself to see if it's the right fit for what I know

about my students' needs and capabilities."

"It's an issue in publisher resources. Engineering is a constantly changing

discipline especially related to technology – textbooks can't keep up."

Related to the third concept, skills for finding and using OER, several participants

expressed the acquisition of these skills as goals for their participation in this research

project. They spoke of wanting to learn "how to create open content," where to find

"accurate OER," how to "increase awareness, use, and support for OER at an institutional

level," and how to "take pollen from flowers [learn a variety of things about OER]."

Face-to-face participants asked several questions during workshops, including:

"How do the open licenses work?"

"Do the resources cover what the learners need to learn?"

"How can we know if the resource is high quality?"

"What can we create or license in terms of full online modules?"

There were some critical comments from the face-to-face participants related to the

overall concept of use of OER:

"I want to examine how OER can be more like publisher material in terms of how collaboration and peer-reviewed quality are concerned. Quoting Jordan Peterson, 'Decentralization has risks'."

"There are other more advanced tools the students need to learn to work with – OER appear to be passive learning elements and not compelling."

"Sharing is challenging. Engineering conferences have no record of interactions, no proceedings. Open is not something that's being talked about."

Based on observations, notes, and field notes from the face-to-face workshops, participants were generally positive about the potential of OER. They were focused on expanding their skills and discussing a variety of concerns and insights about the challenges of finding and using OER in their individual contexts. There were some brief off-topic conversations about issues such as campus technology solutions and the overall level of students' capabilities and skills for learning. However, participants predominantly stayed focus on OER topics.

As an activity in workshop A, University A and College A participants ($n = 11$ and $n = 3$, respectively) created a series of single-word or short-phrase sticky notes associated with the task, "define open education." Sticky notes are small, brightly colored blank note-papers with adhesive on the back, top edge and are often used as part of brainstorming activities. They can be placed on a blank wall and easily moved and re-moved by participants as they reflect and communicate about the tasks they have been asked to accomplish. Figure 4 is an image of a digital word cloud generated by a Java-based website, Wordle (http://www.wordle.net) that demonstrates words (codes) that participants used to explore the meaning of open education and use of OER in their

context. The larger a word in the word cloud, the more frequently the participants used that particular word. The purpose of using a word cloud as a method of qualitatively analyzing this data was based on the idea that the word cloud simulated the experience of participant categorization and debrief of concepts as part of live facilitation of a sticky note activity.

Figure 4. Word Cloud Showing Participant Responses to the Question, "What is open education?"

Words such as *accessible*, *free*, *access*, *learning*, *creative*, and *creativity*, as well as words referring to potential obstacles to using OER such as *scattered*, *work*, and *inconsistent* stood out among the many terms used by participants. While this was not an activity that directly contributed to answering the research questions of the study,

participants were highly engaged in the process of writing, sharing, and summarizing ideas defining open education.

   Post-intervention webinars. Two participants from University A, one participant from University B, and one participant from College A (at total of $n = 4$) participated in post-workshop webinars (open-ended interviews) about their experiences of engaging in dialogue and learning more about OER. Transcripts were analyzed using a series of pre-determined codes, related to research questions three and four, as part of a structural coding process. Observations from researcher field notes as part of the workshops were also analyzed in this data. The design of the webinars was relatively unstructured and participant-driven. Structural codes and frequency are included in Table 31. Common themes that emerged from participant excerpts were also included in column three of the table.

Table 31

Frequencies and Themes from Structural Coding of Participant Conversations in Post-

Workshop Webinars[a]

Structural codes	Frequency	Themes
Experience	59	Already using OER, gained several new ideas, increased skills, students need textbooks (quality resources), OER repositories are valuable
Question (includes questions posed by the researcher)	43	How can students be contributors? How can we make the greatest difference with OER?
Insight	38	Collaboration decreases workload for adapting/creating OER, OER involve more work than publisher textbooks, students can be effective contributors, there are more OER than I thought
Intention	25	Will adapt/create an open textbook this year, will find collaborators, will engage learners as co-creators
Recommendation	21	Educators need effective institutional support for OER, small group workshops are effective, support is effective when requested, good handouts are helpful
Impact	8	Awareness of OER is growing, the potential for increasing student success rates using OER is clear

[a]n = 5 (four participants plus the researcher)

Based on the themes of the responses in this qualitative analysis, three concepts

regarding the perspectives of face-to-face participants emerged. These concepts and

representative excerpts are illustrated here:

- Concept One: OER workshops lead to increased skills and confidence in finding

  and using OER;

- Concept Two: Collaboration is one key to success for adapting/creating OER;

- Concept Three: Institutional support and professional development for OER are critical

Participants spoke of their increased confidence:

"The list of websites regarding where to start our search—it was the most valuable aspect for me, for sure, because I wasn't very familiar with the concept of OER itself. I mean, I had some understanding, but to me, the task of finding them was so daunting. That seemed like an impossible task to accomplish. Having those [websites] made it possible now."

"There were many pieces of OER I was using, and didn't realize they were OER."

"One of the biggest issues I had with OER is that I didn't exactly know where to start looking for them. After attending the workshops, I now know some of the best websites to search for OER."

Other participant responses addressed ideas about collaboration:

"I think it's a nice trade-off that, you know, if you share your stuff with us, we'll share our stuff with you. And everybody benefits, right? If all the other things that other people are doing are useful to you, then if you share the whole product, then hopefully, everyone has a chance to use the parts that are useful for them."

"I always want to partner. I always want to collaborate. It's just a better way to do things. I get so much more done if we could do that."

An example about collaboration among learners was also shared:

"Yeah, and then they're actually improving it because they're doing the editing and it's on the Wiki and the version comes out, they have a bit of ownership over it, too. They like it when it's a product of theirs, as opposed to an assignment they do and they hand it in to just you. This thing goes out to the big wide world."

Related to concept 3, participants spoke of their ideas about professional development and support:

"The universities, they shared yesterday, and I was talking to my colleague, [saying] also that [the] university should support open education more as compared to the other projects. "

"The 'build it and they come' approach doesn't really work, or at least not very quickly. And of course, academics don't like being made to do anything. Something proactive, but not intrusive, would be good—workshops and the like—but the issue will be how to get people into these workshops."

"Resource pages would also be great, and by-request support, too."

"But if you could put together a generic thing that gets most of that, at least the general idea down on the nitty gritty pieces, as you say, I think that would really grow. At least people [would be] taking the plunge, as opposed to ... I see a lot of people sitting on the sidelines saying, 'Wow. This looks cool, but I don't know.' And maybe that would be enough to push them into the let's-try-it-out stage."

There were more insights and experiences shared than questions asked in the post-intervention data. Example questions that did emerge included the following:

"Who will have access to open material I'm creating before I'm ready to share?"

"Who can I partner with on my campus for research on OER?"

"What can I do to find more supplemental [OER] resources?"

"How do we spread the word about open?"

To summarize the post-workshop qualitative analysis, face-to-face participants felt that the intervention (workshops A and B and the webinar) was a very effective opportunity to bolster their knowledge about OER and increase their interest in using them as part of their practice. All participants articulated in various ways that they did not know there were so many repositories and options for searching for OER, and assured me they intended to explore OER over the summer (the data collection period for this intervention was March–April 2018). At least two participants were already actively finding and adding OER to their courses.

Two of the four participants in the post-intervention webinars were interested in collaboration as a means of reducing OER workload, and expanding their communities of practice. All participants indicated that institutional support was a critical element of OER success, and recommended that "just in time" or "by-request" support was most effective for them as they moved through OER explorations. Finally, all participants had recommendations for how professional development could be designed and delivered. Face-to-face in small groups was the predominant recommendation (which was their experience for this intervention). Three of the participants also advocated for self-directed digital guides for OER that could be accessed on an "as needed" basis.

MOOC Participants' Qualitative Data

Several qualitative data sources from MOOC participants were analyzed to contribute to answering the research questions posed for the study, and to complement, verify, or dispute findings in the quantitative data. Data collection from the MOOC was unique in that all of the qualitative data were captured in the participants' own words. Participants who had self-identified as Ontario educators were included in MOOC qualitative data for analysis if they provided any of the following data: comments on the pre-intervention survey instrument, at least one discussion forum post while the course was running live, blog posts during the course, and/or open-ended comments on the post-intervention survey. The mid-course and final-day webinars for the MOOC were recorded and transcribed for analysis. The sources were organized and analyzed as follows:

- Category One: pre-intervention open-ended data from the survey instrument, online course discussion forum postings, and blogs from Ontario educators

- Category Two: a transcript from the mid-MOOC webinar (held on day eight of the 15-day MOOC), a transcript from the post-MOOC webinar (which took place on day 15 of the MOOC), and open response data from the MOOC participant post-intervention survey instrument

Category One. Process coding (coding line-by-line using gerunds, or –ing words) was used to explore the active words of the MOOC participants in the pre-intervention open-ended comments, the discussion forum posts, and the blog posts. Saldaña (2016) provided dozens of options for a first cycle coding method, and described process coding as "appropriate for virtually all qualitative studies, but particularly for those that search

for the routines and rituals of human life" (p. 111). As part of this study, I was seeking data about the learning process of the intervention (as a ritual of participants' lives) to identify ways that participants engaged in learning and sensemaking. Data for this analysis were generated by 17 participants who were highly engaged in the daily assignments and reflection tasks included as part of the MOOC design. There were 14 days of content in the MOOC, and each day had a small task as an opportunity for participants to apply what they were learning plus a discussion post where they reflected on their process of learning.

From the postings of 17 Ontario participants, 1,195 "–ing" words (gerunds) were coded. Table 32 demonstrates the most frequent words that emerged. Only words that had 10 or more instances of repetition were included in the table.

Table 32

Frequency of Terms from Process Coding of MOOC Participant Discussion Data[a]

Process code	Number of codes
Learning	52
Sharing	34
Creating	30
Connecting	26
Finding	21
Looking	20
Teaching	20
Using	20
Adapting	16
Working	14
Building	13
Trying	13
Exploring	12
Licensing	12
Talking	12
Collaborating	11
Engaging	11
Posting	11
Providing	11
Reading	11
Adding	10
Doing	10
Helping	10
Thanking	10

[a]*n*=17

A word cloud-generating website called Wordle (http://wordle.net) was used to

create a visual display of all 1,195 coded words, as shown in Figure 5. My intention in

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using the cloud—a representation of the most frequently used words in a collection—was to provide an alternative to a numeric table as a focus for discussion. While the frequency table above captures the quantitative element of this analysis, the individual reader is encouraged to reflect on the word cloud and consider for themselves the relative value of each of the words in their context.

Figure 5. Process Codes Derived from MOOC Participant Discussion Forum Posts. This word cloud was generated on the basis of –ing words, coded as part of the analysis.

Category Two. The transcript from the mid-session MOOC webinar ($n = 6$), the

transcript from the final day of the MOOC ($n = 4$), and the open responses from the post-

intervention survey instrument ($n = 7$) provided insights into the experiences and

recommendations of Ontario participants. There were non-Ontario participants in the

webinars, but their responses were intentionally omitted in analysis. The conversational

webinars provided an opportunity to address topics related to research question four of

the study: "In what ways might professional development for use of OER be improved?"

In total, there were 152 excerpts coded for these data. An analysis and organizational

structure for the codes (based on research question four) is provided in Table 33. In the

third column of the table, themes that emerged as part of second cycle coding were listed.

Table 33

Structural Codes, Frequencies, and Themes Derived from MOOC Participant Webinars

Structural codes	Frequency	Themes
Experience	73	Positive learning experience, positive networking experience, potential for practice is clear, more OER than I thought
Recommendation	25	Self-directed content, hands-on practice, opportunities for meaningful connection, by-request support from institutions
Insight	19	Open is a process, OER are diverse, I am already an open educator
Question	15	Unique topics
In vivo	14	Unique examples
Intention	13	Intend to use OER this year, want to collaborate, want to share what I've learned with colleagues
Impact	8	Positive impact on practice and skills

As the primary elements of research question four, experiences and recommendations emerged as the most frequent elements of discussion in the MOOC webinars and post-intervention survey instrument open responses. There were three observations that emerged through analysis:

- Observation One: The MOOC was a positive learning experience for skills and connection

- Observation Two: Recommendations centered on learning design and institutional support

- Observation Three: Professional development for use of OER led to positive intention to use OER

Sample statements from MOOC participants about their learning experience illustrated these observations:

"I'm taking a lot from it. I'm learning a lot. And I like the activities because they take me out of my comfort zone, so that's really good."

"I became more confident in my understanding of being open, the benefits and challenges, and techniques."

"The Making Sense of Open Education has been a tremendously positive learning experience for me and I encourage you, my reader, to check it out soon as it will be set up as a self-directed learning opportunity on Open University soon."

Other statements from participants related to their institutions and the design and content of the MOOC:

"I think any support at my institution would be beneficial as we currently don't have very much support."

"The only feedback I have [is] that I think it might work for me. I don't know about others; I'm a visual type of person, and if there were more diagrams and pictures as opposed to text, I think I would pick up the stuff easier from a reader perspective."

"Okay. So if you're aware of any successful cases of using OER in anyone's classrooms, would you mind sharing them with us? Maybe even [if] those cases that didn't work, I would like to learn about what to avoid."

Some participants indicated their positive intention to explore and use OER (and OEP, or open educational practices):

"Because I see value in OEP, I am inspired to take action and advocate for greater openness in others and in my own institution."

"I feel more knowledgeable and therefore more likely to use OERs in my practice."

"I am keen to make incremental changes in the upcoming term and more radical changes in the following year."

OER Advocates' Qualitative Data

To explore the answer to research question one of this study, "How do OER advocates define their goals and motivation for the use of OER?", a questionnaire was designed to provide informed consent and collect responses from advocates. Among the 10 advocates who supported the action research study, eight completed questionnaires related to their goals and motivation. These participants were also asked a short series of demographic questions. Within this group, five worked at universities and three worked at colleges. There were three faculty members with teaching practice and five professional support providers (supporting faculty members and departmental administrators at their institutions), employed as educational technologists, instructional

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designers, and eLearning and curriculum specialists, for example. There was a spectrum of years of experience in post-secondary education, with half of the participants in the six- to 10-year range. These OER advocates—collaborators who agreed to support design and delivery of the MOOC—were asked a very specific series of open-ended questions about their goals and motivations:

1. What are your motivations for advocacy in open education including use of open educational resources (OER) and open practices (OEP)?

2. What are your goals in open advocacy for the remainder of this year and next academic year?

3. What type of supports (if any) do you feel might make your open advocacy work more effective?

4. What aspects of open education are most important to you (e.g., open access, open data, open source software, use of OER, OEP)?

5. What ideas do you have for creating greater awareness about open education on your campus and in Ontario?

6. What ideas do you have for increasing use of OER and OEP on your campus and in Ontario?

Responses to these questions ($n = 8$), shown in Table 34, led to the generation of codes grounded in the structures of research question one. There were 132 excerpts coded in the first cycle of structural coding. The logical sequence of the structural codes and themes that emerged, led to the creation of a concept map of OER advocacy, illustrated in Figure 5.

Table 34

Structural Codes, Frequencies, and Themes Based on OER Advocate Responses[a]

Structural code	Frequency	Themes
Goal	27	Design, policy, awareness, collaboration
Belief	16	Transformative, good pedagogy, opportunity, access, diversity
Motivation	16	Innovation, altruism, connection, research, community
Need	16	Collaboration, commitment, funding, space, connections
Focus	15	OER, OEP, Open access, Open data, Open source
Idea	14	Support, discussion, student involvement, creating committee
Action	13	Planning, strategy, conversation, professional development, modeling, sharing
Obstacle	8	Time, staffing, funding, patience, cohesiveness, buy-in
Impact	4	Awareness, use, interest, policy

[a]*n*=8

OER advocate responses regarding their goals, beliefs, and motivations were clearly articulated as part of data collection. Specific excerpts related to the two primary concepts in research question one, goals and motivations, were as follows:

- Goals

  "I aim to run a little focus group, an appreciative inquiry with faculty who have adopted open assessment practices within their courses, with the aim of adding their stories and classroom-tested concepts to the Ontario conversation."

  "I am co-chairing an open education working group at my institution, so an instrumental goal is to produce the recommendations we are slated to deliver to our vice-provost (academic programs)."

"'In the immediate [future], we are reaching out to department chairs across

campus and inviting ourselves to a departmental meeting to share the work of the

task force thus far."

- Motivations

"I believe in the empowering potential of OER and OEP."

"The philosophy of 'open' and the practices it generates can lead to really

innovative classroom practices that, I believe, can be transformative for

instructors, students, and the community beyond our institutional walls."

"I'm excited by the many potential research questions to explore re OEP,

particularly in a northern Ontario context."

"My motivations for OER are to save students money."

As part of the analysis of OER advocate responses, an alternative approach was

considered in terms of organizing the data. A reflection about the structures used for

coding led to an idea for a chronological pathway that might be useful when describing

the perspectives of advocates. Figure 6 represents an emerging possibility for how OER

advocates might be supported in framing their experience of advocacy. As with many

educational action processes, the structure for OER advocacy would be iterative,

particularly around the areas of ideas, goals, obstacles, and needs that emerge when

planning for action. An example of one pathway for how an advocate might follow this

structure is as follows:

- **Focus:** I am interested in open educational practices (OEP), the ways that OER

  can be used to create learner-centered activities and assessments using OER.

- **Motivation:** I am motivated to experiment with OEP in my course to determine if learners can achieve learning outcomes based on OER as a new method of teaching.

- **Goal:** I would like to conduct a small-scale action research project on OEP and learner success in my course.

- **Action:** I will find and add 10 OER to my course and develop an action research plan.

- **Obstacle:** I need my department chair's approval to change my course resources and structure.

- **Needs (emerging from the Obstacle):** I need to ensure my department chair understands my intention. I also need REB approval to conduct my research.

- **Re-Action (new action based on the resolution of an obstacle):** My approvals are secured, I now need to design and deliver my course idea.

- **Impact:** If my research hypothesis is true, learners in my course will achieve similar successful outcomes using no-cost OER, and will have learned new skills of resource discernment, adaptation, and sharing practices based on OEP.

Open Education Advocacy Exploration

Focus				Obstacles

Focus → Motivation (Values) → Goals

Obstacles → Needs (emerging from obstacles) → Re-Actions (new actions once obstacles are overcome)

Actions ↔ Needs

Goals → Actions → Impact ← Re-Actions

Figure 6. Open Education Advocacy Exploration. This diagram depicts the structure and stages of advocacy practice.

Summary

Results of the analyses for the study, along with the tables and figures produced throughout this section, supported the purpose of the research and were specifically designed to focus on answering the four research questions of the study. Face-to-face participants and MOOC participants were intentionally separated for the purposes of analysis in order to explore different perspectives based on different interventions. The quantitative analyses, including descriptive statistics, frequency of responses, and the paired samples *t*-test provided a road map for measurable data, and the qualitative tables and figures helped to demonstrate key concepts that emerged during repeated analyses of participants' words.

In Findings and Discussion Based on Results, the results of the analyses will be explored in the context of the purpose and research questions for the study and the relevant literature on OER and change management.

CHAPTER 5

Findings and Discussion Based on Results

The purpose of this mixed-method action research study was to determine the usefulness of an awareness and support strategy to increase awareness and use of OER among post-secondary educators in Ontario. Assessing the usefulness of the intervention involved collecting and analyzing quantitative and qualitative data from participants. The use of an exploratory mixed-methods action research design (MMAR) helped to ensure that the research was firmly grounded in the perspectives and experiences of both open education experts and participants. There were four research questions that informed the method and guided the data collection and analysis for the study:

1. How do OER advocates define their goals and motivation for the use of OER?

2. To what extent might the OER professional development experiences of this study impact educators' intention to use OER?

3. What questions and insights about OER emerge as part of a sensemaking process among educators?

4. In what ways might professional development related to use of OER be improved?

In this chapter, results from the analyses of data are discussed using the research questions as a framework. Examples from both quantitative and qualitative results are integrated to contribute to a cohesive narrative of complementary and contradictory findings. In order to help situate the findings in the existing literature of OER and change management, select elements of the literature reviewed for this study are included in the narrative.

RQ1: How do OER advocates define their goals and motivation for the use of OER?

In the previous chapter (Analysis and Results), results from an analysis of responses to an OER advocate questionnaire were presented ($n = 8$). These data were analyzed to determine structural codes and themes embedded within the responses to questions about goals and motivations among the participants. While clear goals and motivations were articulated by the advocates, there were also fuzzy boundaries between what participants described as motivations, and whether or not those motivations might be more accurately categorized as beliefs. There were also questions about whether the goals that advocates described were actually ideas or actions they would take, or impacts they thought OER might have. An idea emerged during analysis that an exploratory framework might help to clarify goals and motivations as a support for OER advocates. A diagram is shown in Figure 7 below. Explicitly articulating stages of open advocacy exploration may provide opportunities to achieve faster impact, and may help institutional partners to better understand advocate needs.
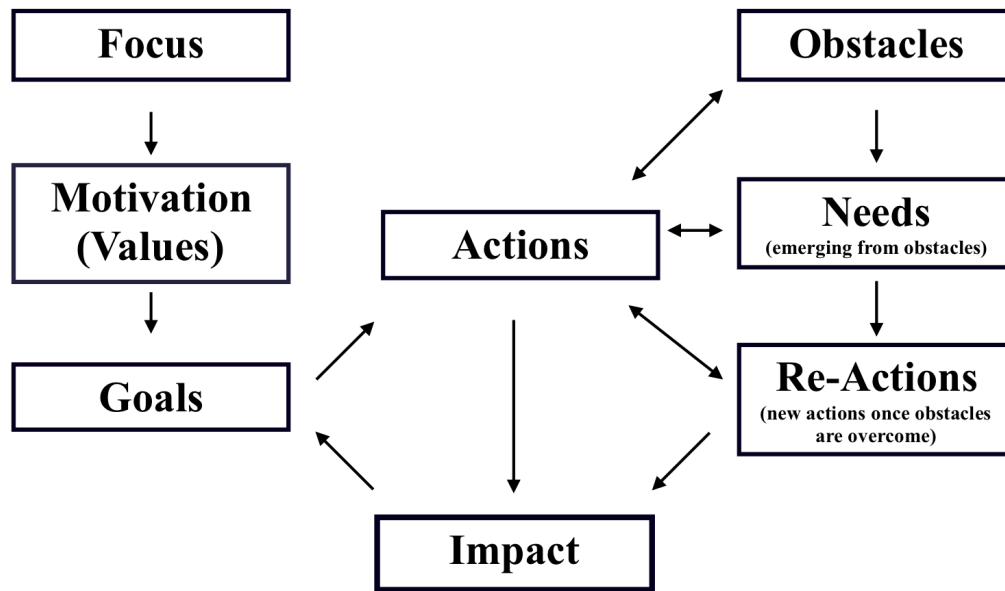
Open Education Advocacy Exploration
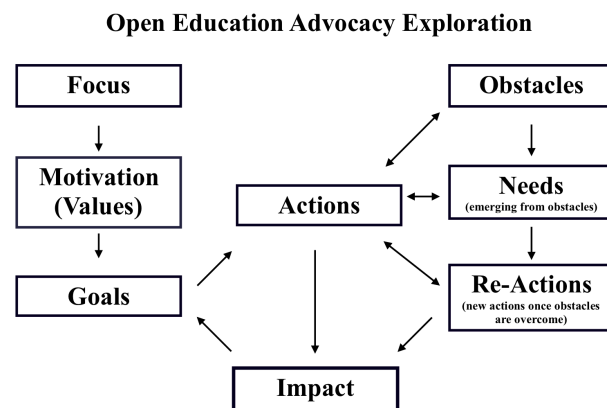
Figure 7. Open Education Advocacy Exploration. This diagram depicts the structure and stages of advocacy practice.

Results of the data analysis of OER advocate responses also touched on change management issues, particularly around the role of change agents. For the purposes of this study, OER advocates were considered change agents. Rogers (2003) gave clear descriptions of the work of change agents. He defined a change agent as "an individual who influences clients' innovation-decisions in a direction deemed desirable by a change agency" (p. 366). He described elements of the roles of change agents as follows: to communicate the need for change, to exchange information, to diagnose problems, to translate client intention into action, and to support clients to become self-sufficient in terms of their success in achieving skills related to innovations. During the design and delivery of the MOOC for this study, my desired outcomes represented a change agency outlook, OER advocates were the change agents, and I considered the Ontario educator participants of the MOOC as clients in the context of Rogers' framework. There was agreement among the OER advocates that use of OER was the innovation we were collaboratively advocating for and supporting.

Examples of OER advocate responses about goals and motivations revealed several excerpts that aligned with Rogers' articulation of change agent roles as follows:

- "I aim to run a little focus group" was related to exchanging information and diagnosing problems.
- "An instrumental goal is to produce the recommendations we are slated to deliver to our vice-provost" was an example of communicating the need for change.
- "I am also designing and delivering PD [professional development] for faculty in this area" was an example of supporting clients to become self-sufficient.

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- "One faculty member will come to me looking for a course resource, we'll find a suitable OER, then all of a sudden three more faculty members are coming to me the next day, looking for OER, too!" was an example of translating client intention into action.

Rogers (2003) also described the large-scale process of diffusion of innovations as a process of communication within a social system. Certainly, there was a social system at play between OER advocates and educators participating in the MOOC during this study. In what Rogers called a "decentralized" social system, the impact of OER advocates' activities as change agents might have been most effective during individual conversations that took place. Rogers also considered the technical competence of change agents an important characteristic in the process of successfully diffusing innovations. The technical competence of OER advocates had a distinct impact on MOOC participants' Perceived Behavioral Control, which will be discussed as part of research question two in the next section.

Many of the OER advocates focused on OEP (open educational practices) as a way to describe their goals and motivations, particularly in terms of the theme of beliefs, which emerged as part of the analysis. OEP has been described in emerging research as a mature practice in use of OER for teaching (Cronin, 2017; Deimann & Farrow, 2013; OLCOS, 2012). Advanced OER practitioners (who are often OER advocates) have embraced the use of OER in their teaching and have moved on to explore the ways they can leverage the pedagogic advantages of OER. The question related to these explorations might be framed as follows: if OER provide permissions to adapt, reuse, remix, and retain, in what ways might they be used by educators and learners to explore

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the co-creation of new knowledge in their disciplines? This focus on OEP for teaching and learning was very present in the OER advocates' data.

The final data elements of this study that helped to answer research question one were the observed actions of the OER advocates. Action was one of the key ways that OER advocates defined their goals and motivations. The willingness of OER advocates to embrace the research project by designing and sharing a module of content for the MOOC, and then facilitating questions and a discussion among their MOOC participants, was typical behavior for open education advocates in my global experience. These advocates were willing to take professional risks. They were excellent curators of open content, they promoted and supported the success of the MOOC through social media, they were willing to openly share their intellectual property, and they acknowledged the importance of making themselves available in support of educator-participants. All of these actions were accomplished through volunteer hours, over and above their professional paid work, as contributions toward the success of open education in Ontario.

Taking into account a possible framework for open education advocacy, the work of the OER advocates as change agents, their mature practice as promoters of OEP, and their generous activities as volunteer facilitators, the summative answer for research question one was as follows: OER advocates define their goals and motivation for the use of OER in terms of their focus on the pedagogic benefits of OER, professional development experiences they design and facilitate for motivated learners, and their positive impact on learner attitudes and skills related to use of OER.

RQ2: To what extent might the OER professional development experiences of this study impact educators' intention to use OER?

Icek Ajzen's (1991) Theory of Planned Behavior was an important theoretical influence for this study. Ajzen posited that change in human behavior was influenced by three elements: attitude toward the behavior, subjective (or social) norms (what others think), and perceived behavioral control (the degree to which people believe they have the skills and knowledge to conduct the behavior). He contended that these three constructs might have an influence on *intention* to behave, which in turn might have a clear impact on actual change in behavior. Ajzen also suggested that interventions might be designed to positively shift attitude, subjective norms, and perceived behavioral control in ways that increased the likelihood of change. The final element of Ajzen's theory was that pre- and post-intervention survey instruments could be designed to accurately measure the impact of an intervention.

The behavior change under consideration for this study was use of OER. The participants were Ontario educators, and the intervention was the face-to-face workshops and MOOC professional development opportunities. For purposes of a pre- and post-intervention discussion in this section, the most important quantitative data were the results from analysis of the $n = 6$ face-to-face participants who completed the pre- and post-intervention survey instruments, and the $n = 8$ participants from the MOOC who also completed both instruments. Results of the analyses for face-to-face and MOOC participant cohorts offered predominantly different findings; therefore, I will continue to discuss them separately.

Attitude toward OER. With respect to the six survey instrument items that comprised the Attitude Toward OER construct, the face-to-face participants showed the greatest shift in means of agreement from pre- to post-intervention for these items, especially for the following two items: "I would recommend the use of OER to other educators," and "I believe OER add value to the spectrum of resources available in my discipline." Because of the low number of participants who completed pre- and post-intervention instruments, any given person might have had a large effect on the means.

One of the participants from the face-to-face cohort showed major positive gains from pre- to post-intervention, moving from a scale of zero "I do not know enough about OER to answer at this time" to three (agree) for one of the six items. This same participant moved from zero to four (strongly agree) for four of the remaining six items. This positive shift likely had a large impact on the means over $n = 6$ participants. It was surprising, but important, to note that two of the six participants actually moved down the scale a point or two (moving toward disagreement) for some of the items. Based on positive, open-ended remarks in the post-intervention survey, and observations in the workshops, it is difficult to know the meaning of the reduced scores for the post-intervention instrument items. Although the finding of the paired-samples t-test demonstrated that there was no significant difference from pre- to post-intervention means for Attitude Toward OER, certainly for several participants there were important positive changes. Overall, the group means moved from 15.83 to 18.17 from pre- to post-intervention.

Among MOOC participants ($n = 8$), the six items for Attitude Toward OER also demonstrated a positive means gain from 16.62 to 19.87 in pre- to post-intervention

responses (shown in the paired-samples *t*-test results). This was an important shift, and the largest positive shift, among the three constructs of the study for the MOOC participants. Two of the eight participants in this cohort showed significant positive gains in their response for this construct, which likely had a large effect on the overall means for the group. Although the shift in Attitude Toward OER did not demonstrate a significant change, it demonstrated an important and positive change from pre- to post-intervention for the MOOC participants.

As confirmation of the importance of the positive shift in Attitude Toward OER, results of the qualitative analysis for MOOC participants who participated in the mid-MOOC and post-MOOC webinars confirmed a variety of positive attitude themes. Participants felt that the MOOC was a positive learning experience, a positive networking experience (building community), and that the potential for practice was clear. Other than recommendations for improvement of the design of the MOOC, there were very few critical opinions expressed among MOOC participants about the value of OER for their practice.

An important finding in the quantitative analysis for Attitude Toward OER (and an indicator that not everything was positive for participants) was that there was almost no improvement in means from pre- to post-intervention related to supply and search options for OER. Both cohorts of participants (face-to-face and MOOC) were persistent in their attitudes that there was an insufficient supply of OER for their disciplines and that OER were difficult to find. These findings were indicators that better professional development was needed around these issues, and that there needed to be better repository designs and an increased supply of high-quality OER developed. These

findings were consistent with concerns described in the global literature on OER (Clements & Pawlowski, 2012; Lund Goodwin, 2011; Mtebe & Raisamo, 2014).

For both the face-to-face participants and MOOC participants, the construct Attitude Toward OER shifted in important positive ways. This finding aligned with the literature that emerged building on Ajzen's (1991) Theory of Planned Behavior; two studies reviewed in Chapter 2 (Lee, Cerreto, & Lee, 2010, and Mijares et al., 2017) found that attitude toward a behavior was the most significant influence on intention to enact the behavior.

Perceived behavioral control. With respect to face-to-face participant findings from pre- to post-intervention on the items in the second construct, Perceived Behavioral Control, participants showed almost no positive gains. They remained around the 3.00 mean level, agreeing (but not strongly agreeing) that they understood open licenses, were confident searching the Internet for OER, and were confident attributing any OER they used in their courses. While there was little quantitative change from pre- to post-intervention, results of the analyses of qualitative participant data during workshops and webinars indicated that participants sought and valued professional development for use of OER. Identified as Concept Three in the workshop qualitative analysis, an important and repeated theme was as follows: "Educators desire professional development and support to improve their skills for finding and using OER." Face-to-face participants framed their goals for the workshops primarily in terms of skills; what they wanted to learn more about related to finding, sharing, and using OER in their teaching.

Confirmed as Concept One in the results of the analysis of post-workshop webinar data, face-to-face participants acknowledged that their participation in

workshops A and B had increased their confidence in finding and using OER in their practice. One of the participants summarized this clearly: "One of the biggest issues I had with OER is that I didn't exactly know where to start looking for them. After attending the workshops, I now know some of the best websites to search for OER." Similar statements were made by many of the participants during and after the workshops.

Unlike face-to-face participants, MOOC participants in this study demonstrated important shifts in the Perceived Behavioral Control construct. The mean differences from pre- to post-intervention were not quite as high as they were for construct one (Attitude Toward OER). However, overall, the eight MOOC participants moved from disagreement to agreement, from a mean of 7.12 to 10.00, from pre- to post-assessment, in terms of their confidence in finding and using OER. This was the only positive shift in the study that seemed to indicate a statistically significant finding (a two-tailed finding of $p = .023$ in the paired samples t-test with $\alpha < .05$). This was *the* most important quantitative finding in the Theory of Planned Behavior framework for the study.

The literature on OER (Mtebe & Raisamo, 2014; Rolfe 2012) indicated that a clear understanding of copyright and open licensing rules was required for OER users to advance their practice. The design of the MOOC, therefore, contained significant content related to the skills and knowledge needed to find and use OER successfully, as well as how to interpret open licenses and attribute openly licensed works accurately. Much of the active practice of the MOOC (the daily tasks) provided educators with opportunities to explore what they were learning about these topics in their own contexts. Face-to-face participants in the study did not receive nearly as much content or time for practice on

these tasks. This is one possible explanation for why the face-to-face participants did not show similar gains in confidence compared with MOOC participants for these items.

Corroborative qualitative data related to MOOC participants and Perceived Behavioral Control were found in the results of the process coding analysis of MOOC participant discussion forum and blog posts. As will be discussed in greater detail as part of the answer to research question three, a very high number of excerpts from MOOC participants were coded as learning, sharing, creating, connecting, finding, and looking. These active practice codes were directly related to improving the skills needed to find and use OER, and likely contributed to the significant increase among MOOC participants in confidence related to these tasks.

Intention to use OER. For the final quantitative construct of the study related to Ajzen's (1991) Theory of Planned Behavior, face-to-face participants showed almost no pre- to post-intervention difference for Intention to Use OER. They began the study with high positive intention, and completed it with high positive intention. The *most* important aspect of this finding may be the issue of self-selection in a volunteer study such as this. Face-to-face participants for the study were recruited by email through their teaching and learning centers. The informed consent and workshop descriptions made it clear that this study was researching the use of OER and that they would be learning more about it through participation. Participants who were not interested in OER were unlikely to volunteer.

During analysis of face-to-face participants' post-workshop webinar data, the structural code "intention" led to the identification of several themes where participants clearly articulated their intention to use OER. They indicated that they would adapt or

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create an open textbook in this coming academic year, that they would find collaborators to conduct their open work, and they would engage learners as co-creators of OER.

Results related to intention to use OER were similar among face-to-face and MOOC participants. Among MOOC participants there were only small positive shifts from pre- to post-intervention survey instrument responses for the items in the Intention to Use OER construct. One of the items, "I will discuss use of OER with colleagues," actually moved downward from a mean of 3.50 to 3.38. Given the overall low number of participants, and evidence from qualitative analysis results, this downward shift was not considered an important detail for the findings.

With respect to qualitative data and Intention to Use OER, there were several indications that MOOC participants intended to use OER in the near future. Based on the structural coding process for mid-MOOC and post-MOOC webinars, participants signaled that they would use OER this year, that they intended to collaborate, and that they wanted to share what they had learned with colleagues. These findings were tied to the four quantitative items for Intention to Use OER and provided well-aligned, qualitative affirmation for this construct.

A revised diagram adapted from the work of Icek Ajzen (2006) demonstrates the effects of the constructs for this study, as show in Figure 8 below.
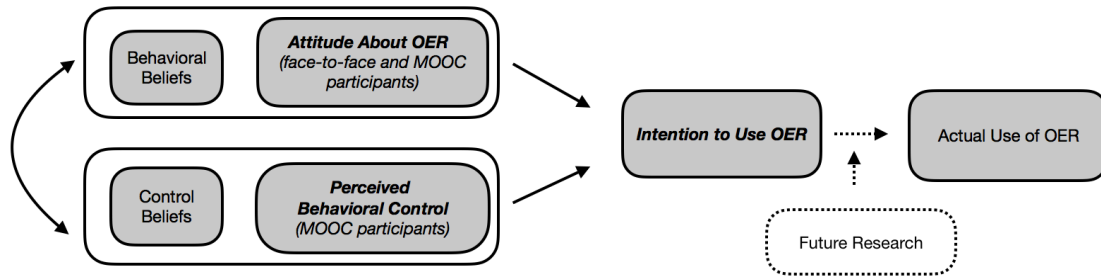
Figure 8. Adapted Theory of Planned Behavior Diagram. Relations among the three major constructs for this study adapted from Ajzen (2006).

To summarize, the answer to research question two for this study was as follows: professional development for use of OER had small, but important, positive impacts on participants' Attitude Toward OER and Perceived Behavioral Control, leading to Intention to Use OER. The first construct, Attitude Toward OER, had the largest influence on Intention to Use OER for face-to-face participants, but in the case of the MOOC participants, it was Perceived Behavioral Control that seemed to have significance related to intention. These positive influences were confirmed when quantitative pre- and post-intervention data were analyzed and integrated with qualitative experiences and insights from participants.

RQ3: What questions and insights about OER emerge as part of a sensemaking process among educators?

Answers to research question three were found in data explorations and results of analyses related to the live learning and reflection for both the face-to-face and MOOC cohorts. In the face-to-face context, observations, questions, responses, and insights from participants occurred as part of activities and dialogue designed into the workshop

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facilitation plan. In the MOOC cohort, questions, responses, and insights occurred primarily in the form of discussion forums and blog posts participants created as part of their reading and applied practice (the daily tasks of the MOOC). Questions and insights also emerged for each participant group (face-to-face and MOOC) as part of post-intervention webinars that were recorded, transcribed and analyzed.

Weick, Stucliffe, and Obstfeld (2005) defined and described sensemaking (a dominant influence on the intervention for this study) as a process of organizing, sequencing, establishing identity in social contexts, extracting cues, and making sense retrospectively. The focus of making sense for this study was use of OER, for both face-to-face and MOOC participants, and the results of qualitative analyses for the two groups revealed a variety of insights and questions that emerged while they were engaged in these processes.

One of the first tasks conducted by face-to-face participants as part of workshop A was an exploration of the definition of open education, followed by sharing of formal definitions from the literature. An amalgamation of responses from participants at College A, University A, and University B was created as part of qualitative analysis of their data. Figure 9, shown below, is a word cloud generated from one-word sticky note responses from participants.

Figure 9. Word cloud showing participant responses to "What is open education?"

The positive words that seemed most visible in Figure 8 were *accessible, free, learning, access, reusable, online, and creativity*. There were, however, some words that seemed to paint a less positive picture for the participants. Some examples of these terms were *work, scattered, terror, big failure/loss, unstable, and inconsistent.* Conversations with participants as part of the workshops revealed that many were new to the practice of finding and using OER. Several of the less positive words from the word cloud were discussed in more detail as part of the workshop to determine activities for workshop B that might help reduce concerns related to the use of OER.

Related directly to research question three, six structural codes were used to explore notes, observations, and field notes generated by the researcher during workshops A and B of the intervention for this study. The codes were insight, obstacle, motivation,

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goal, concern, and question (in order of frequency from results). Three concepts emerged from an analysis of themes related to the structural codes as follows:

- Concept One: *Textbook costs are a key driver for use of OER*

- Concept Two: *Quality assurance of OER is an important issue*, and

- Concept Three: *Educators desire professional development and support to improve their skills for finding and using OER.*

These concepts were related more to insights about sensemaking than questions, although several questions emerged from the face-to-face participants, including the following:

- How do the open licenses work?

- Do the resources cover what the learners need to learn?

- How can we know if the resource is high quality?

- What can we create or license in terms of full online modules?

For face-to-face participants, insights seemed to focus on quality assurance, improvement of skills for finding and using OER, and the cost of textbooks as an important driver for use of OER. Questions tended to focus on quality and skills.

Indications of concern over the quality of OER among face-to-face participants emerged in their responses as part of the "Attitude Toward OER," items in the pre- and post-intervention surveys. Evidence for these concerns were confirmed in the extremely low quantitative ratings (disagreed and strongly disagreed) that there were high quality OER available in their disciplines. Despite several conversations with face-to-face participants about this issue (a process of active sensemaking in partnership with them), post-intervention quantitative analyses revealed persistent disagreement that there were

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high quality OER in their disciplines. Additional results from face-to-face qualitative analysis of data revealed similar obstacles and concerns cited in the literature on OER (see Chapter 2). These similarities included difficulty in finding OER that were aligned with students' needs, insufficient standards or methods for quality assurance of OER, a lack of knowledgeable staff to support use of OER, and finding time to revise courses (Mtebe & Raisamo, 2014; Rolfe, 2012).

Three insights were discovered in face-to-face participant post-workshop webinar transcript analyses (using a structural coding process): collaboration is important and might decrease the overall workload involved in adapting or creating OER, use of OER entails more work than using publisher textbooks, and students might be effective contributors (co-creators) of open resources. These themes were considered somewhat outside the structure of the research questions for the study, but may be taken into consideration when planning future professional development activities or research.

For MOOC participants, insights and questions related to research question three led to the choice of process coding for the discussion forum and blog posts created during the two-week run of the open course. The resulting word cloud, shown as Figure 10 below, was the most significant moment of qualitative analysis for me throughout this study. The visual results of the word cloud highlighted the idea that insights, questions, processes of sensemaking, theories of behavior, and opportunities for diffusion of innovations were grounded in building successful and supportive social learning experiences embedded in communities of practice (CoPs) (Wenger, 2000).

Figure 10. Process Codes Derived from MOOC Participant Discussion Forum Posts. A word cloud generated based on –ing words, coded as part of analysis.

Even though it may sound dramatic, when I pushed the 'generate' button on this word cloud and it emerged, I felt that every word—every one of the 1,195 codes I applied to the excerpts, and every process of this research project—pointed to this visual representation of sensemaking and community-building as the *ultimate* finding of the study.

When designing the interventions for this research, I took a number of Wenger's (2000) recommendations into account and used the following concepts of design:

- imagination (how individual and small-scale communities viewed their role in the creation of knowledge and practice);

- engagement (how CoPs worked together in-person and virtually to create

  artifacts, processes, and dialogue about their knowledge); and

- alignment (how members of a CoP looked outside of their context to

  determine gaps in their knowledge and identify which of their practices

  complemented the work of similar CoPs).

The constraints of my time-limited interactions with face-to-face participants prevented

some of these concepts from fully maturing. However, over the 15 days of the MOOC, as

seen in the data from the discussion forums and blogs, all three of these concepts were

enacted in detail. The participation of the OER advocates in the mix of course design and

facilitation for the MOOC also contributed to the high level of activity and sharing of

perspectives that occurred. The critical elements in the success of MOOC participants

forming a temporary community for learning were directly related to the core of

Wenger's (2000) descriptions of social learning systems. These elements were socially

defined competence (what a community of practice determined competence to be), and

individual experiences (what an individual explored and observed within their personal

practice) as they were explored and shared in real time.

During the MOOC, Ontario educators were in the course discussion forum nearly

every day. They were reading content, practicing, sharing, and reflecting on their

experiences in multiple ways. Like face-to-face participants, MOOC participants self-

selected to take part in what was clearly described as a significant (although flexible)

time commitment related to exploring use of OER (15 days). Like face-to-face

participants, MOOC participants' quantitative agreement with items for Intention to Use

OER demonstrated high means (strong agreement) from the beginning of the data

collection period. Within the MOOC discussion forum, I had a place where I could actually capture and read about the sensemaking processes of MOOC participants in their own words. The MOOC participant sensemaking processes were collaborative, personal, intense, challenging, engaging, provoking, and generous. As a researcher, this open and transparent sharing of data provided many effective elements, which collectively generated a participant-informed answer for research question three.

To summarize the findings from this study that were relevant for the answer to research question three, a variety of questions about and insights into OER emerged as part of a sensemaking process among educators. Questions included the following:

- How can we ensure quality for OER?

- How can we learn more about the skills needed to find and use OER?

- How might educators collaborate with peers and learners to adapt and create OER?

In terms of insights, there were many among the face-to-face and MOOC participants, but common ground for them included the following:

- OER workshops (and open courses) lead to increased skills and confidence finding and sharing OER;

- Institutional support and professional development for OER are critical if awareness and use are to increase;

- There are challenges to using OER, particularly ease-of-use of repositories (finding OER), and the number of high-quality OER available across disciplines;

- Practice in finding OER, understanding and applying open licenses, exploring, connecting, and sharing OER are activities within a CoP that may shift educator perspectives related to using OER in their practice.

RQ4: In what ways might professional development related to use of OER be improved?

In many ways this was the most straightforward research question to answer for this study. In post-workshop and MOOC webinars, participants engaged in conversations about their experiences during the intervention and their recommendations for future professional development designs. Both cohorts of participants (face-to-face and MOOC) provided open-ended responses to two questions in the post-intervention survey instrument that were worded as follows:

1. If you feel that your perceptions about use of OER have shifted during the study period (March–May, 2018), what changes have you noticed, and what practices have contributed to this change?

2. What design elements or approaches for professional development for educators do you believe would be most effective in supporting exploration of use of OER (e.g., face-to-face workshop, self-directed online modules, resource pages, virtual webinars, by-request support at your institution, a combination of options)?

Face-to-face participants shared experiences and indicated that they learned they were already using OER (but hadn't formally called them OER), they gained several new skills and ideas from multi-disciplinary colleagues about how to use OER, and located some good OER repositories they would explore further. In terms of recommendations for professional development, they suggested that institutional supports for use of OER

(on a "by-request" basis) were important for their personal success, that small group workshops over multiple sessions with inter-disciplinary colleagues were useful, and that handouts and resource pages that educators could explore on their own would be helpful supports.

MOOC participants shared slightly different experiences and recommendations as compared to face-to-face participants. In terms of experiences, they were overwhelmingly positive about the learning and community-building that took place, they made new connections with each other and intended to stay connected going forward, they discovered that there were more OER than they thought, and they wanted to explore becoming OER advocates among colleagues at their institutions.

With respect to recommendations for professional development, MOOC participants also indicated (similar to face-to-face participants) that institutional support for course revision and professional development were very important for their success. They also indicated that they would appreciate "by-request" support when it was needed, that self-directed content and practice opportunities were valuable, and that they would appreciate a mix of content types (text-based, diagrammatic, and audio- or video-based).

Each cohort valued the type of intervention in which they participated—face-to-face participants valued face-to-face workshops, MOOC participants valued flexible, asynchronous options as part of a community of practice. To answer research question four, the findings indicated that professional development might be improved with a mix of options as follows: creating and sharing of self-directed resources, opportunities and channels to connect with others, dedicated support staff with expertise in use of OER, a

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mix of resource and content types for learning, and small-group workshops that aligned with educators' available time.

Topics Outside of the Research Questions

There were three topics that emerged during analyses of data that did not directly address the research questions for the study, but that seemed important to participants based on the results of the data analyses. In the following section, I will highlight these topics both in the context of my problem of practice (use of OER in is not widespread in Ontario) and in terms of the purpose of the study (to determine the usefulness of an awareness and support strategy to increase the use of OER among post-secondary educators in Ontario).

It was interesting to me (and in no way intentional) that among the combined face-to-face and MOOC participants ($n = 38$), there were 19 university educators and 19 college educators (colleges offer two-year programs in Ontario). This coincidence represented a potential balance of perspectives relevant to the two types of post-secondary institutions in Ontario, and this balance was relevant to the important elements outside the research questions.

One of the most revealing findings outside of the research questions was the large majority among both face-to-face and MOOC participants that reported using learner-purchased publisher textbooks and resources. Thirteen of 14 face-to-face participants indicated they used learner-purchased textbooks (either hard copy or eTexts) for their teaching, and 17 of 24 MOOC participants indicated the same. This finding aligned with Weller's (2014) assertion that open textbooks, as direct replacements for learner-purchased textbooks, may be a fruitful option to pursue with educators to persuade them

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to use OER. If it can be demonstrated that there is a high-quality, equivalent open textbook that will suit an educator's course needs, then the no-cost option of OER would be an easy choice.

Participant concerns about the quality of OER, particularly in the consistent quantitative disagreement among face-to-face and MOOC participants that there were few high quality OER in their disciplines, felt important to acknowledge in the findings. Despite some indication in the literature on OER that cost was a critical social justice issue (Florida Virtual Campus, 2016; Senack, 2015), for both face-to-face and MOOC participants, quality of the resource and relevance for their topics were more important than cost. This finding may reinforce evidence that cost is not the only issue on the table when engaging in course resource conversations (Allen & Seaman, 2014; Clements & Pawlowski, 2012; Jhangiani et al., 2016), and that professional development and support for use of OER must account for quality and relevance in terms of educator concerns.

A final element of the results of data analysis that I felt was important, but outside of the research questions, was the indication that Ontario college-level educators in this study indicated they had less autonomy than their university counterparts with respect to course resource decisions. Conversations about use of OER and textbook replacements may therefore have lower value for educators who are not empowered to make such decisions. Eight of 24 participants who took the MOOC (just over 30%) indicated that they had little or no role in course resource decision-making. All eight of these participants were college educators. This might be useful information to take into consideration when designing professional development for OER at colleges, and might also be a focus for future research.

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Summary

Detailed in this section, answers to all four of the research questions of the study were discovered in the results of the analyses of both quantitative and qualitative data. Three additional elements that seemed important to participants emerged outside of the research questions. These elements were included as part of the discussion. The opportunity of triangulation and integration of quantitative and qualitative data confirmed the value of the exploratory mixed method used in the study and enriched the opportunities for discussion. The findings for this study also confirmed (and, in a couple of cases, contradicted) the quantitative and qualitative information and findings in the literature on OER. This comparison with literature exposed possible opportunities for future research. In the final chapter for this dissertation, the purpose of the study, why it matters, implications for practice and research, lessons learned, and limitations of the study will described with some concluding thoughts.

CHAPTER 6

Conclusions

In this final chapter, I would like to start off where I began my doctoral learning and research journey—with my problem of practice. At the outset of this dissertation, I identified my problem and stated, "The use of open educational resources (OER) is not widespread among Ontario college and university educators." I went on to describe the problem in local, national, and global contexts and arrived at this purpose for the study: to determine the usefulness of an awareness and support strategy in increasing the use of OER among post-secondary educators in Ontario. I believe the design and findings of this study successfully fulfilled the purpose. In my view, the awareness and support strategy (the intervention for the study) demonstrated usefulness because many of the participants repeatedly indicated, during and after the intervention, that they were more committed to using OER in their practice because of the skills and knowledge gained from the workshops and MOOC (massive open online course). There are now more Ontario educators using OER than when I began my study in the fall of 2017. I would not yet say that the use of OER among Ontario college and university educators is widespread, and so my problem persists, and my journey continues.

In Chapter 3, I outlined what I felt were the key elements of trustworthiness for an action research study, and I believe I upheld my strategies successfully. I took care in my research design and method to follow standard practices for action research as a requirement of my degree program. I reviewed and considered relevant existing research in the context of my explorations with participants. I explained and defended my design

and method choices for both readers and committee members. Finally, I conducted my

work ethically, with respect for the care and safety of my participants.

The purpose of the study was achieved in partnership with OER advocates and

Ontario educators. With them, I explored two types of awareness and support strategies,

one in the form of face-to-face workshops, and one in the form of a MOOC. We all

learned, we all provided each other with feedback and ideas, and I was able to determine

whether or not the professional development strategy I had designed was useful by

examining evidence and feedback from participants. As described in Chapter 5, the

research questions for the study were answered effectively. The big question—the one

that I believe still needs to be addressed—is "Why does this study matter?" In the

following sections of this chapter, I will address the ways I believe this study matters, for

whom it might matter, and what I plan to do next in terms of practice and research.

Implications for Leadership and Learning Design Practice

In my original application for the Arizona State University Doctor of Education

program, I proposed doing a self-reflective ethnography. I wanted to determine ways that

I might be a better leader and better learning design practitioner in the context of global

open education. I wanted to consult people around me, including work colleagues,

educators with whom I designed online courses, global research peers, and learners who

took the courses I designed. Alongside them, I wanted to find ways to improve my

practice. While a mixed-methods action research project was not what I had envisioned,

it turns out that I was able to accomplish all of the learning I desired by carrying out just

such a project. In this first section of my concluding chapter, I will describe my learning

and why I believe this study matters in the context of post-secondary education leadership and learning design practice.

In terms of leadership, findings from this study confirmed that effective leadership among post-secondary practitioners is often decentralized (Rogers, 2003). This decentralized leadership was most evident in the actions of the OER advocates who partnered with me in the design and delivery of the MOOC. Their well-informed advocacy, their motivation to increase awareness and use of OER, and their technical competence supported a positive shift in the practice of participants through a model of caring community-building. Their participation with me was independent of a top-down or centralized mandate for support of OER at their institutions.

Findings from this study provided the following implications for leadership and use of OER:

- Use of OER is best framed as an invitation for educators to explore and not as a requirement of practice.
- Effective advocacy for use of OER requires advocates to have technical competence. Some examples of this competence include the following: experience of multi-modal learning theory and pedagogic practice, knowledge for finding and use OER repositories, understanding of technical content file formats, familiarity with the adaptation tools that are needed to adapt and share content, and a good grasp of the issues of copyright and open licensing. This competence requires compensated time for ongoing professional development.

- Advocates and interested educators may benefit from social (rather than isolated) professional development experiences where they can communicate and support each other.

- Institutional support and professional development are critical factors in expanding the use of OER among educators. Educators in this study expressed the desire for additional professional development and exploration of OER, and indicated their OER practice would benefit from access to knowledgeable supporters.

- When OER advocates and educators from a variety of institutional roles are given encouragement and opportunities to share their knowledge, use of OER increases.

The intervention for this study, the workshops and webinars with face-to-face participants, and the MOOC learning experience were grounded in participant needs and recommendations found in the literature on OER and change management. Even though there were evidence-based recommendations for the design of the intervention in this study, use of OER is still relatively new, so the professional development strategies for this study were experimental, exploratory, and innovative. Because the formats and content were also new, several implications for practice were discovered. Based on feedback from participants about the design and delivery of professional development related to OER, the following implications for learning design and professional support practitioners emerged:

- Supporting educators to form socially connected learning groups, whether digital or face-to-face, is an important component of success for individuals new to the practice of OER.

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- Facilitated, active practice in the skills of finding, adapting, and creating OER, and understanding and using open licenses, are critical elements for success in increasing use of OER.

- Learner choice in terms of types of content (text-based, visual, audio, or video) increases engagement and retention of knowledge in professional development experiences.

- Wherever possible, face-to-face learning in small, discipline-diverse groups is an effective method for exploration of OER.

- Partnership with knowledgeable OER advocates in professional development experiences provides newer learners with opportunities to connect and ask questions as they are learning.

Implications for Research

Many articles reviewed for this study concluded that more research on the use of OER was needed to provide evidence of their effectiveness for both learner and educator success. A dearth of research was cited as a problem at global, national, and provincial levels. With respect to change management theory, Rogers (2003) asserted that an innovation-decision process might include five levels of user engagement: knowledge, persuasion, decision, implementation, and confirmation. Such a process would require a more longitudinal approach to interventions and research. In particular, Rogers' list indicated that follow-up studies on implementation of OER and measurable confirmation of educator and learner success in using them would be beneficial.

As I stated at the start of this chapter, I do not feel my research has ended with the completion of this study. There are many possibilities for ongoing learning based on my

experience with a small number of Ontario educator-participants. I believe this study does matter in terms of the contribution it has already made to research related to increasing the use of OER in post-secondary contexts both in Ontario and beyond. I am very pleased to have accomplished that much. Hopefully, it is a contribution that may be built upon by me and by others.

Based on this study, opportunities for further research into open educational resources in Ontario include:

- Well-structured and ethically designed research is needed at course and institutional levels to determine whether intended goals for use of OER are being met.

- The development of rigorously tested quantitative instruments that may be used in multiple research projects across Ontario have value in terms of gathering consistent province-wide data for analysis.

- The role of OER advocates as change agents in the diffusion of innovations aimed at increasing the use of OER seemed important as part of this study. There is a significant lack of global research about the work and motivations of OER advocates and this would be an excellent area of focus for a study in Ontario.

- Quantitative research involving a rigorously recruited sample of Ontario post-secondary educators would have value for establishing a valid baseline of the current state of OER use in Ontario.

Limitations

There were some limitations in this study that may have had an impact on the relevance of the findings for readers. The size of the participant group, $n = 38$ Ontario

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educators and $n = 10$ OER advocates, was small in comparison with the general population of Ontario educators (approximately 25,000). This study was not generalizable and did not demonstrate an accurate sample of the population of Ontario educators.

The reliability of the quantitative instrument for this study was tested to determine whether or not the three main constructs for the study were measuring what they were intended to measure (internal consistency among participants). For both face-to-face and MOOC participants in the study, these tests revealed reliability coefficient findings ranging from .86 to .93, well within the acceptable range for quality research. While these results were encouraging, the small number of participants in the study, $n = 14$ face-to-face and $n = 24$ MOOC participants, were not within recommended participant numbers for accurate reliability findings.

The limited time window for data collection meant that I was unable to pursue as much variety in data as I would have liked. Data from face-to-face educators who were non-participants (i.e., those who were not interested in learning more about OER) might have provided worthwhile insights and a balance against the predominantly positive views and feedback of those who did participate. Follow-up interviews with participants who enrolled but did not complete the MOOC might also have shed light on the quality of the design, in particular the time commitment needed. The limitations of this study may be taken into consideration as part of future research for use of OER in Ontario.

Lessons Learned

It is difficult to summarize the journey of learning that brings me to the final paragraphs in this dissertation. There have been so many people and places and events

involved. I will narrow lessons for this section down to my doctoral program at Arizona State University, which included the process of learning in courses, designing this research project, and completing it.

The physical and mental processes involved in becoming an accomplished practitioner-leader and practitioner-researcher, while simultaneously being a full-time graduate student and a full-time professional learning designer, were grueling. Undertaking a program like this should not be sugarcoated or underestimated in terms of the level of work and dedication required. Like many in my cohort over the past three-plus years, I have often asked myself, "Why am I doing this?" The answer is complex, of course, but the simple version is that I care about learners. I want every learner to have a good teacher and a good learning experience, and I want to have as many skills as possible to help ensure that that happens. Wherever I go, wherever I land in my professional career, I will use the practical lessons learned in my program—the skills of reading research, academic writing, understanding of education systems, caring and skillful leadership, and the design and implementation of qualitative and quantitative education research—to focus on learners, and to support them to help make our planet a better place through learning. What I learned about learning in the context of my goals and practice is that none of it was wasted—all of it was worth it, it all moves me forward, informs me, and improves me.

The design of this research project is grounded in my professional work as an open learning designer. Whatever professional title I have in the future, this is who and what I am at my core: I design open learning experiences. When this project took an awkward turn in terms of the number of participants I was recruiting, the task of pulling a

MOOC out of thin air was a great joy for me. I love designing open learning experiences.

I love working with open colleagues as collaborators, and I love learners who are willing

to take supported risks with me. This research project, even within the bounds of a formal

doctoral program, has been an open project with open advocates and open educators.

People from all over the world have supported and advised me, and been with me in the

trenches of learning and writing. What I have learned is that open research is a

collaborative, rich community process and it is the only way I can imagine conducting

future research.

I also learned some very specific things about mixed-methods action research

during this study. I learned that it is a flexible, iterative, messy process, in which making

mistakes and learning quickly are the two primary activities. Continuous cycles of

planning something, trying it, looking at the data, and refining it are the events that

happen in such research. These events happen in large-scale and small-scale ways,

including the crafting of a title and the design of a slide for a workshop. I have tried

things, tested things, reversed my thinking, and taken unexpected paths throughout the

cycles of this study. These processes were all part of the design and final implementation

of this project. What I learned about research design is that there is no right way to do it,

and all is not lost if you do not get it right and have to re-do it. I also learned that the best

research design plays to your strengths, aligns with your motivations, and is firmly

grounded in the lived experiences of your participants.

Completing the analysis and writing of the final phase of this research project has

been the most difficult task of all for me. It was one thing to imagine it, plan it, and craft

the details. It was another, very different thing to gather the chaos of data and the people

involved with data into words that make sense, and connect words that might have meaning for me and others. To achieve my stated purpose, to find the answers my research questions in a carefully documented way, was extraordinarily difficult work. Here are some of things I learned about completing research projects that I want to share:

- Whatever time you plan, plan more time. You will need more time than you imagine for reflection, and you will likely need more time than you planned to deal with unexpected obstacles. Reflection is a critical factor in good research and should not be rushed.

- Use the cycles of your research to fully understand your participants, their patterns of behavior, their language, their needs, and their contexts. The more immersed you become, the easier it will be to collect and interpret the final data you need for your purpose.

- Test your interpretations and words with others and then listen to their feedback. It is almost impossible to make sense in isolation.

- Find some way to enjoy the hard work you are undertaking, refer back to your "Why am I doing this?" question and answer to remind yourself of your motivation.

- When something amazing pops up in your data and analyses, enjoy the moment, marvel at the surprise of it, and make certain you write something down about it.

- Your memory will be faulty when it comes time to finish your project and you should take notes as you go.

- The final thing I learned is that completing a research project generates an astonishingly quiet void—take a moment and rest in it.

As indicated in the Implications for Research section above, there are many opportunities for me to continue my research. There are many aspects of this project that I still want to test and explore. There will be more cycles and more explorations of the use of OER in Ontario, and more opportunities for me to see how OER are being used in other places in the world. The focus of this study was on the perspectives of educators. I might focus next time on advocates; I believe their place in global open projects is significantly under-researched. I will continue to read, participate, improve my practice, and conduct research respecting all of the lessons I have learned.

Final Thoughts – A Call to Action

In my experience, both in conducting this study, and in my interactions with colleagues in Ontario and globally, many open educators are motivated to be open educators for social justice reasons. These reasons expand beyond the socioeconomic issues of the cost of post-secondary resources to embrace diversity, inclusive design, access to post-secondary institutions, the empowerment of open educational practices (OEP), the achievement of UNESCO's 2030 education goals (global education for all), digital pedagogy, and, most importantly for me, the acknowledgement that learners are our future. Learners are the vital co-creators of knowledge in our time. Openness empowers them. I'd like to leave you with a simple invitation, if you're not already using OER, consider exploring them, engage in sensemaking, and incorporate more of them into your teaching practice if they're useful.

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APPENDIX A

FACE-TO-FACE PARTICIPANT RECRUITMENT

Dear Educator:

This recruitment information is being sent to you on my behalf by the College A Teaching and Learning Centre, a supportive partner in my research. My name is Jenni Hayman. I am a doctoral candidate working under the Supervision of Dr. Craig Mertler of the Mary Lou Fulton Teachers College at Arizona State University. I am conducting a research study called *Open is an Invitation: Sensemaking and Use of Open Educational Resources (OER)*. The purpose of my study is to learn more from Ontario educators about how they find and use course resources as part of their teaching and learning. Open educational resources (OER) might be one part of how you find and use course resources, but knowledge about OER is not a requirement for this study.

The study is taking place from February 2018 through May 2018. If you agree to participate, please complete the survey instrument linked below to help establish a pre-study view of your course resource selection strategies. You will be asked to complete a similar survey instrument in May 2018 to determine if awareness and support strategies (workshops) of the study have had an impact on your use of OER. I am also an eCampusOntario Program Manager but have no contact or influence at your institution related to funding of Ontario proposals. I would be deeply grateful for your participation and feedback about Ontario post-secondary practices.

The time commitment for the full study is approximately six hours in the Winter/Spring 2018 term for a Pre- and Post-Study survey instrument, two in-person workshops at College A, and one 1-hour webinar in May 2018.

Link to the Pre-Study Survey: [link to survey]

Workshops on-site at College A:

Thursday, March 15, 2018 10:30am to 12:30pm - Sensemaking and use of Open

Educational Resources, Workshop A

Thursday, April 12, 2018 10:30am to 12:30pm – Sensemaking and use of Open

Educational Resources, Workshop B

Informed Consent Details

You are being invited to participate in this research study because you teach a

course at an Ontario post-secondary institution. The purpose of the research is to increase

awareness and use of open educational resources (OER) among interested Ontario post-

secondary educators by learning more about how educators select course resources, what

they already know about OER, and their concerns related to use of OER. Development

and use of open educational resources (OER), which are no-cost, high quality content

items such as open textbooks, videos, audio files, images, illustrations, simulations and

more, may lower the overall cost of post-secondary education for learners, and may

increase the diversity and local context of resources for teaching and learning. Therefore,

this research may inform practices that present benefits for both educators and learners.

There will be approximately 20-30 participants per institution, at a variety of Ontario

institutions invited to participate in the study.

If you agree to participate in this research, your responses will be collected using

the electronic survey instrument available at the link below with another email and link

following in May 2018. Data from this instrument will be analyzed to inform the

elements of the study related to how educators select course resources, and awareness,

concerns, and use of OER. You are free to decide whether to participate in this study, you

may decline to answer any individual question, survey instrument, evaluation, in-person session, or interview at any time and there is no penalty for declining to participate.

In addition to completing the pre- and post-study survey instruments, you will be asked to attend two in-personal professional development sessions (no longer than two hours per session) scheduled for Thursday, March 15, 2018 from 10:30am to 12:30pm, and Thursday, April 12, 2018 from 10:30am to 12:30pm. You will also be asked to attend a one-hour webinar in May of 2018 at a mutually convenient time for all participants. The purpose of the webinar is to share your progress in thinking about use of open educational resources, and answer any remaining questions you may have after a period of reflection.

There are no foreseeable risks to participation in this study. I cannot promise any benefits to you or others from your taking part in this research. However, possible benefits include: expanding your personal learning related to the definition of OER, the opportunity to reflect on what influences your process of course resource decision-making, and informing the diversity of research data for this study with your specific experiences and concerns related to OER.

Efforts will be made to limit the use and disclosure of your personal information, including research study records, to people who have a need to review this information (myself and my dissertation supervisor). The results of this study may be used in reports, presentations, or publications but your name will not be used. The research team will strive to ensure the confidentiality of your research-related records. Absolute confidentiality cannot be guaranteed.

If you have questions, concerns, or complaints about this research contact the research team — Dr. Craig Mertler at [email] or [phone] or Jenni Hayman at [email] or [phone].

This research has been reviewed and approved by the Arizona State University Social Behavioral IRB (Institutional Review Board]. You may talk to them at [phone] or by email at [email] if:

- Your questions, concerns, or complaints are not being answered by the research team.

- You cannot reach the research team.

- You want to talk to someone besides the research team.

- You have questions about your rights as a research participant.

- You want to get information or provide input about this research.

This research has also been reviewed and approved by College A REB team and you may contact them with any questions or concerns by phone at [phone] or email: [email].

Thank you for your consideration of participation,

Jenni Hayman, Doctoral Student

Dr. Craig Mertler, Associate Professor and Research Supervisor

Reminder: Information designed to support informed consent for this study will be repeated at the beginning of the survey instrument.

Link to the Pre-Study Survey: [link to survey instrument]

APPENDIX B

RECRUITMENT AND INFORMED CONSENT FOR MOOC PARTICIPANTS

Welcome to the course and thank you very much for agreeing to participate in this community learning experience. Before the course gets rolling on Friday, June 1, please read the following details about the course as a research project. If you are a post-secondary educator currently teaching a course anywhere in the world, I would deeply appreciate your consideration of completing a pre-course and post-course survey instrument. You are under no obligation to do so and you may fully participate in the course if you do not wish to complete the surveys. Here is a link to the pre-course survey instrument and the details of informed consent:

Pre-Course Survey link: [link to survey]

This course is part of a doctoral research study being conducted by Jenni Hayman under the supervision of Dr. Craig Mertler of Arizona State University. If you have any questions or concerns about consent or ethical issues, please contact Jenni, Dr. Mertler, or the Arizona State University Institutional Research Board (IRB) using the following information:

Dr. Craig Mertler at [email] or [phone] or Jenni Hayman at [email] or [phone].

This research has been reviewed and approved by the Arizona State University Social Behavioral IRB. You may talk to them at [phone] or by email at [email] if:

· Your questions, concerns, or complaints are not being answered by the research team.

· You cannot reach the research team.

· You want to talk to someone besides the research team.

· You have questions about your rights as a research participant.

· You want to get information or provide input about this research.

The Researcher and The Study

My name is Jenni Hayman and this two-week learning experience is part of my doctoral research on awareness and use of open educational resources (OER) in Ontario, Canada. I am a doctoral candidate (currently collecting data) enrolled in the Doctor of Education in Leadership and Innovation program (Ed.D) at Arizona State University. I am a fully online graduate student. A core part of my identity as an Ed.D learner is my participation in the Global OER Graduate Network (GO-GN), a group of doctoral learners from across the global that collaborate and practice as open researchers working on studies in open education.

In addition to graduate learning, I work full-time as a Program Manager for eCampusOntario. eCampusOntario is a government-funded post-secondary service organization in Ontario, Canada. My work with my team focuses on learner success through technology-enabled and open teaching and learning. I have the privilege of building open community and exploring learning experiences with 25,000+ educators and administrators, and over 800,000 post-secondary learners at the 24 colleges and 21 universities in Ontario.

The Study

This course is one element of my (Jenni Hayman) larger dissertation called *Open is an Invitation: Sensemaking and use of Open Educational Resources*. It is a mixed-method action research study (MMAR) and the purpose of the research is to increase awareness and use of OER among educators. The specific participants I seek for my research are post-secondary educators that are currently teaching a course (or courses).

All others taking part in the MOOC are most welcome! Our collaborative learning experiences will definitely help expand awareness and practice in open education.

Participation, by completing both a pre- and post-course survey instrument, is not a requirement to engage in the course, but I deeply appreciate the opportunity to learn more about you in ways that inform and improve my practice going forward.

I will be collecting and analyzing data from the course discussion forum in the OpenLearn UK Moodle instance of the course, but no real names or personally identifying information will be used in analysis or published in the dissertation or any related articles or presentations. I will be aggregating responses through qualitative coding to find common themes and experiences. You can opt out of participation in the Moodle shell at any time without penalties or repercussions.

You are welcome to email me [email] and ask me to leave your data out of my analysis. I'm happy to respect your preferences. If you are a post-secondary educator (currently or recently teaching at a college or university), and willing to be a participant in this study, here is a link for the pre-course survey instrument which should take approximately 15-20 minutes to complete.

Pre-Course Survey link: [link to survey]

APPENDIX C

OER ADVOCATE RECRUITMENT AND INFORMED CONSENT

Dear Open Advocate,

My name is Jenni Hayman. I am a doctoral student working under the direction of Dr. Craig Mertler of the Mary Lou Fulton Teachers College at Arizona State University. As a global learning design practitioner, and advocate for the use of OER in higher education contexts, I am asking for your help, which will involve your permission for me to collect and analyze various elements of your experiences in our collaborative MOOC (massive open online course) called *Making Sense of Open Education*. These activities may include completion of an intake questionnaire related to your goals and motivations for participating as an OER advocate; use of your course design (if you opt to design one of the daily learning activities); observations of your interactions on social media and in the course discussion forum captured as part of my regular field notes; and an end-of-course interview if you're interested.

All data that I collect and analyze will be anonymized (all interview audio files deleted once transcribed, and all identifying data on artifacts redacted) to protect your identity. Signing this letter indicates your overall agreement to participate. Please note:

- Your participation in this study is voluntary. If you choose not to participate or to withdraw from the study at any time, there will be no penalty whatsoever.

- You may selectively opt out of data collection on any task, or at any event by letting me know your preference. There will be no penalty whatsoever.

- The benefit to participation is helping me to develop effective awareness and support strategies that may lead to increased use of OER in Ontario.

- There are no foreseeable risks or discomforts to your participation.

- Your responses will be confidential. Results of this study may be used in reports, presentations, or publications but your name will not be known.

Please read the following consent statement and, if you agree, please sign, or return your agreement by email, and I will collect data throughout our course experience:

Consent Statement (you can save this document as PDF, sign and return electronically, or send an email confirming the following paragraph):

I agree to participate in Open Education Advocacy elements of data collection described above as part of the course design and/or delivery team for *Making Sense of Open Education*. I understand that data will be collected over the run of the course and through social media and blog posts before and after. I understand that there will be no repercussions if I opt out of data collection. I am at least 18 years of age.

If you have any questions concerning the research study, please contact the research team — Dr. Craig Mertler at [email] or [phone] or Jenni Hayman [email] or [phone]

Thank you,

Jenni Hayman, Doctoral Student

Dr. Craig Mertler, Associate Professor

Your signature below indicates that you consent to participate in the data collection activities.

_____   _____

       Participant's Signature   Date

If you have any questions about your rights as a participant in this research, or if you feel

you have been placed at risk, you can contact Craig Mertler at [phone] or the Chair of the

Human Subjects Institutional Review Board through the ASU Office of Research

Integrity and Assurance at [phone].

APPENDIX D

FINAL PRE-INTERVENTION SURVEY INSTRUMENT

Description of the survey instrument [this preliminary information will not be shared with participants]

The following pre-intervention survey instrument was designed using Ajzen's (1991) Theory of Planned Behavior recommendations. There are 42 items total. In addition to some demographic items, there are three main constructs as follows: Attitude About OER; Perceived Behavioral Control related to technology and use of OER; and Intention to Use OER. The technology-related questions under Section 6 were adapted from an existing OER survey instrument that is attributed to the ROER4D (Research on Open Educational Resources for Development) Research Project and licensed with a Creative Commons 4.0 International license.

[Participant section begins here]

Section 1. Introduction to the Research. About This Research and Consent.

Hello and thank you for agreeing to participate in this research project about course resource decision-making in Ontario. The estimated time to complete the survey is 20 - 30 minutes. Please read the following consent information related to participation in this questionnaire:

By selecting "Yes" to question 1 below, you agree to participate in this questionnaire and share your responses with the researcher. You understand and agree with the following:

- Your responses will be collected, analyzed, and shared as part of the researcher's dissertation and any related public presentations or reports

- The researcher will ensure that any personally identifiable information about you will not be shared, and that data collected through this survey will be hosted and protected using encrypted software and hardware.

- There will be no repercussions if you opt out of data collection at any time.

- You are at least 18 years of age.

If you have any questions concerning the research study, please contact the research team — Jenni Hayman at [email] or [phone], or Dr. Craig Mertler at [email] or [phone].

Thank you,

Jenni Hayman, Online Doctoral Student and eCampusOntario Program Manager

Dr. Craig Mertler, Dissertation Supervisor and Associate Professor, Arizona State University

If you have any questions about your rights as a participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board through the ASU Office of Research Integrity and Assurance at [phone].

1. I consent to the collection of my responses in this survey (Note: you must answer this question to move on in the questionnaire).

     Yes – If participant selects yes, they will be taken to the first page of the survey

     No – If the participant selects no, they will receive the following message:

     "You have been directed to this page because you selected the "No" answer related to consent for this research. If you have reached this page in error, please begin the survey again and ensure you answer "Yes" to the consent question. Thank you!"

2. In order to ensure a comparison opportunity between this survey instrument and a post-study instrument to be disseminated in May 2018, please develop a unique and anonymous code based on the instructions that follow. These instructions will be repeated in the follow-up survey instrument.

Combine the first two digits of your current residence with the city of your birth and the last three digits of your current postal code. For example:

My street address is 32 Plano Drive; I was born in Timmins; and the last 3 digits of my postal code are 2M5.

Therefore, my code would be 32Timmins2M5

Please type your unique code based on the instructions above in the comment box that follows: (Note: you must answer this question to move on in the questionnaire - thank you!) **[open response]**

Section 2. About You. Questions in this section will help the researcher learn about you and your teaching experience.

3. What is your title your institution? **[open response]**

4. Which of the following describes your current teaching practice? (select all that apply)

- I teach undergraduates in person at a college

- I teach undergraduates in person at a university

- I teach graduates in person at a university

- I teach graduates in person at a college

- I teach adults in person as part of continuing education

- I teach undergraduates online at a college

- I teach undergraduates online at a university

- I teach graduates online at a university

- I teach graduates online at a college

- I teach adults online as part of continuing education

- Other (please specify) [open textbox]

5. What subject(s) do you teach (or use course title if you prefer)? **[open response]**

6. How many years have you been teaching?

- Between 1 and 5 years

- Between 6 and 10 years

- Between 11 and 15 years

- Between 16 and 20 years

- 21 years or more

7. What is your preferred gender identity?

- Female

- Mal

- Transgender

- I prefer not to answer this item

- Other gender identity preference **[open response]**

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Section 3. About Course Resources. Items in this section are related to decisions about course resources in the courses you teach.

8. What is your role in selecting courses resources (including textbooks) for your learners?

- I am solely responsible for the selection

- I lead a group that makes the selection

- I am a member of a group that makes the selection

- I influence the selection, but do not have decision-making power

- Others make the selection, I have no role

9. If you do not choose the primary course resources for your course, who has that decision-making authority for your course? (Please use titles rather than real names, e.g., Program Coordinator) **[open response]**

10. Using the list below, select the types of resources you use in your courses. (Select all that apply)

- Images from a stock photo collection

- Images from my campus library

- Images I find using Google search (Fair Use)

- Journal articles from my campus library's collections

- Open Access journal articles

- Web pages (links to external websites)

- Videos (YouTube or other external provider)

- Videos specific to my course (hosted by my institution)

- A publisher textbook (hard copy - student purchased)

- A publisher textbook (eTextbook - student purchased)

- Publisher assessment tools (quizzes, practice, exams - student purchased)

- Publisher simulations (student purchased)

- Simulations developed at my institution (no extra fee for students to use)

- If there are any resources you use that are not listed above, please list them here **[open response]**

Section 4. Factors in Decision-Making. Items in this section will help the researcher learn more about what influences your decisions about course resources.

 [Construct: Social Norms related to course resource decisions]

11. Select the level of importance, from Not Important to Very Important, that the following items have on your course resource decision-making (please include primary and supplemental resources in your reflection). [Designed as a grid with the four choices for each list item as radio buttons from left to right Not Important, Somewhat Important, Important, Very Important].

- Publisher of the resource

- Quality of the resource

- Cost of the resource for students

- Date the resource was published

- Relevance of the resource for the level of the students

- Comprehensiveness of the resource

- Inclusion of supplemental student resources

- Inclusion of supplemental instructor resources

- Recommendation of institutional colleagues

- Recommendation of external colleagues

- Recommendation of my department lead

- Recommendation of librarian

- Other (please specify) **[open response]**

12. What are the two *most* critical decision-making factors for you when choosing course resources? **[open response]**

Section 5. Open Educational Resources (OER). Items in this section relate to any type of resources you have used or might use that are open educational resources.

[Construct 1: *Attitude About OER*]

Definition: Open educational resources (OER) are digitally stored content materials explicitly openly licensed (using Creative Commons or other open licensing standard), where the creators/author(s) grant permission for download, storage, adoption,

adaptation, and re-sharing as part of any learning experience. OER are available at no

cost for users. Content types may include video, audio, text, textbooks, images,

illustrations, animations, and simulations.

13. Is this survey the first time you've seen or heard open educational resources (OER)

defined?   **Yes/No**

14. If you have heard of open educational resources before, where did you hear or read

about them? **[open response]**

15. For the following series of questions, use the definition of OER provided and select

the response that reflects your level of disagreement or agreement with the statements.

OER are easy to find in my discipline.

       Strongly Disagree   **Disagree**   **Agree**   **Strongly Agree**

       I am not familiar enough with OER to answer.

16. There are many high quality OER in my discipline.

       Strongly Disagree   **Disagree**   **Agree**   **Strongly Agree**

       I am not familiar enough with OER to answer.

17. I believe OER add value to the spectrum of resources available in my discipline.

       Strongly Disagree   **Disagree**   **Agree**   **Strongly Agree**

       I am not familiar enough with OER to answer.

18. I am likely to use OER in my courses.

       Strongly Disagree   **Disagree**   **Agree**   **Strongly Agree**

       I am not familiar enough with OER to answer.

19. I have used open educational resources (OER) in my courses.

       Strongly Disagree   **Disagree**   **Agree**   **Strongly Agree**

I am not familiar enough with OER to answer.

20. I would recommend the use of OER to other educators.

Strongly Disagree   Disagree   Agree   Strongly Agree

I am not familiar enough with OER to answer.

21. Using the definition of open educational resources (OER) listed, please select any OER you use in your courses (select all that apply).

Definition: Open educational resources (OER) are digitally stored content materials explicitly openly licensed (using Creative Commons or other open licensing standard), where the creators/author(s) grant permission for download, storage, adoption, adaptation, and re-sharing as part of any learning experience. OER are available at no cost for users. Content types may include video, audio, text, textbooks, images, illustrations, animations, and simulations.

- Images with an open license (Creative Commons or other

- Open textbook

- Open Access journal articles

- Videos labeled with a Creative Commons license (YouTube or other video source)

- Open simulations

- Open Data

- I do not use open educational resources (OER) in my courses

- Other open resources not listed above. **[open response]**

Section 6. Technology Related to Selecting Course Resources. Items in this section relate to your everyday practice using technology for teaching and learning. Some of the responses may seem basic in order to address a wide spectrum of possibilities.

[Construct 2: *Perceived Behavioral Control*]

22. In which of the following ways, if any, have you accessed the Internet in the last three months? (select all that apply)

- Via an Internet-enabled mobile phone (smartphone)

- Via a games console

- At my educational institution

- Via a community facility (e.g., a library)

- Via a commercial facility (e.g., coffee shop)

- Via a tablet computer or iPad

- At home using a broadband connection

- At home using a dial-up connection

- In another way (please specify) **[open response]**

23. Which of the following activities, if any, have you engaged in over the last year? (select all that apply)

- Used presentation software (e.g., Powerpoint)

- Performed calculations with spreadsheet software (e.g., Excel)

- Contributed to a Wiki (e.g., Wikipedia)

- Published a blog post (e.g., Wordpress, Blogger)

- Shared an image online (e.g., Flickr, Instagram, Pinterest)

- Posted on a microblogging platform (e.g., Twitter, Tumblr)

- Took part in a videochat (e.g., Skype)

- Contributed to an Internet forum

- Contributed to a social network (e.g., Facebook, Google+, MySpace, Beebo)

- Used cloud-based storage (e.g., Dropbox, Google Drive)

- Shopped Online (e.g., eBay, Amazon)

- Downloaded a Podcast (e.g., iTunes)

- Downloaded a file using a torrent client (e.g., Bittorrent, UTorrent)

- Filmed and uploaded video content

- Used the administrative tools (e.g., gradebook) of a learning management system as part of a course (e.g., Moodle, Blackboard, D2L or other)

- Recorded and uploaded a podcast

- Other technology activities related to your teaching (please specify) **[open response]**

24. For the following series of questions select the response that reflects your level of agreement or disagreement with the statements.

I am confident conducting web-based research to find course resources.

Strongly Disagree   **Disagree**   **Agree**   **Strongly Agree**

25. I am confident sharing digital resources with learners.

Strongly Disagree   **Disagree**   **Agree**   **Strongly Agree**

26. I understand my institution's policies related to copyright of course materials.

Strongly Disagree   **Disagree**   **Agree**   **Strongly Agree**

27. I am confident using the tools of my college's learning management system.

Strongly Disagree   **Disagree**   **Agree**   **Strongly Agree**

28. I am confident creating audio/video or other media for my course(s).

Strongly Disagree   **Disagree**   **Agree**   **Strongly Agree**

29. I am confident leading students to find and share digital resources.

Strongly Disagree   **Disagree**   **Agree**   **Strongly Agree**

30. **Definition:** Open educational resources (OER) are digitally stored content materials explicitly openly licensed (using Creative Commons or other open licensing standard), where the creators/author(s) grant permission for download, storage, adoption, adaptation, and re-sharing as part of any learning experience. OER are available at no cost for users. Content types may include video, audio, text, textbooks, images, illustrations, animations, and simulations.

For the following series of questions select the response that reflects your level of agreement or disagreement with the statements.

I am confident searching the Internet for open educational resources (OER) for my courses.

Strongly Disagree   **Disagree**   **Agree**   **Strongly Agree**

31. I am confident citing and attributing OER in my course(s).

Strongly Disagree   **Disagree**   **Agree**   **Strongly Agree**

32. I am confident that I have supports at my institution to find and use OER.

Strongly Disagree   **Disagree**   **Agree**   **Strongly Agree**

33. I understand open licenses such as Creative Commons.

Strongly Disagree   **Disagree**   **Agree**   **Strongly Agree**

34. What factors and/or supports are important to you when selecting course resources?

(select all that apply)

- Access to the Internet

- Knowledge about copyright (e.g., Fair Dealing, Creative Commons)

- Support from technology staff

- Technology-related professional learning opportunities

- Support from curriculum designers

- Access to software

- Sufficient time prior to course launch

- Knowledge of the learning management system

- Support from librarians

- Other factors (please specify) **[open response]**

35. What factors and/or supports are important to you when **creating** course resources?

(select all that apply)

- Access to the Internet

- Knowledge about copyright (e.g., Fair Use, Creative Commons)

- Support from technology staff

- Technology-related professional learning opportunities

- Support from curriculum designers

- Access to software

- Sufficient time prior to course launch

- Knowledge of the learning management system

- Support from librarians

- Appropriate compensation

- Other factors (please specify) **[open response]**

Section 7. Use of Open Educational Resources

[Construct 3 – *Intention to Use OER*]

36. Keeping in mind the definition of OER used throughout this survey instrument, select the response that reflects your level of agreement or disagreement with the following statements.

I expect to add new resources to my courses within the next 3 – 6 months.

    Strongly Disagree   **Disagree**   **Agree**   **Strongly Agree**

37. I will explore OER related to my courses within the next 3 – 6 months.

    Strongly Disagree   **Disagree**   **Agree**   **Strongly Agree**

38. I will discuss use of OER with colleagues in the next 3 – 6 months.

    Strongly Disagree   **Disagree**   **Agree**   **Strongly Agree**

39. I intend to participate in professional learning about OER if it is offered at my institution.

    Strongly Disagree   **Disagree**   **Agree**   **Strongly Agree**

40. I intend to experiment with OER in my courses in the next 3 – 6 months.

    Strongly Disagree   **Disagree**   **Agree**   **Strongly Agree**

41. I am interested in learning more about the following types of OER. (select all that apply)

- Images with an open license (Creative Commons or other)

- Open textbook

- Open Access journal articles

- Videos labeled with a Creative Commons license (YouTube or other video source)

- Open simulations

- Open Data

- I am not interested in learning more about OER

- Other types of OER that interest you **[open response]**

42. Are there any insights related to this research, selection of course resources, and OER that you would like to share? **[open response]**

Thank you for your time and care participating in this research.

If you have any questions, please contact the researcher, Jenni Hayman, [email]

APPENDIX E

OER ADVOCATE QUESTIONNAIRE

The purpose of this form is to learn more about open advocates and why they choose to advocate.

Please answer the following required question about informed consent. Based on the Informed Consent information shared with me by Jenni Hayman, the researcher for this project, I agree to share my data on the condition that my responses will be stored confidentially and all responses will be anonymized to the best of the researcher's ability. I understand that my responses are voluntary and that I can exit this questionnaire at any time. **[Yes]**

About You

What is your name?

What institution(s) do you work with?

What is your title?

How many years have you been working in post-secondary education?

- 1-5 years

- 6-10 years

- 11-15 years

- 16-20 years

- 21 or more years

About Your Advocacy

What are your motivations for advocacy in open education - use of open educational resources (OER) and open practices (OEP)?

What are your goals in open advocacy for the remainder of this year and next academic year?

What type of supports (if any) do you feel might make your open advocacy work more effective?

What aspects of open education are most important to you (e.g., open access, open data, open source software, use of OER, OEP)?

What ideas do you have for creating greater awareness about open education on your campus and in Ontario?

What ideas do you have for increasing use of OER and OEP on your campus and in Ontario?

Thank you!

Thank you for completing this brief questionnaire. If you have any questions or concerns about this research, please contact Jenni Hayman, Doctoral Candidate, [email] or Dr. Craig Mertler (Jenni's Dissertation Supervisor) [email].

APPENDIX F

POST-INTERVENTION SURVEY INSTRUMENT

Section 1. Introduction to the Research. About This Research and Consent.

Hello and thank you for agreeing to participate in this research project about course resource decision-making and use of open educational resources (OER). The estimated time to complete the survey is 5-10 minutes. Please read the following consent information related to participation in this questionnaire:

By selecting "Yes" to question 1 below, you agree to participate in this questionnaire and share your responses with the researcher. You understand and agree with the following:

- Your responses will be collected, analyzed, and shared as part of the researcher's dissertation and any related public presentations or reports

- The researcher will ensure that any personally identifiable information about you will not be shared, and that data collected through this survey will be hosted and protected using encrypted software and hardware

- There will be no repercussions if you withdraw from data collection at any time

- You are at least 18 years of age

If you have any questions concerning the research study, please contact the research team — Jenni Hayman [email] or [phone] or Dr. Craig Mertler at [email] or [phone].

This research has also been reviewed and approved by the your University Research Ethics Office and you maycontact them with any questions or concerns by phone at [phone] or email: [email]

Thank you,

Jenni Hayman, Doctoral Candidate and eCampusOntario Program Manager

Dr. Craig Mertler, Dissertation Supervisor and Associate Professor, Arizona State University

If you have any questions about your rights as a participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board through the ASU Office of Research Integrity and Assurance at [phone].

1. I consent to the collection of my responses in this survey (Note: you must answer this question to moveon in the questionnaire). **Yes**

2. In order to ensure a comparison opportunity between the pre-study survey instrument that you completed and this post-study instrument, please add the unique and anonymous code you developed based on the instructions that follow. These instructions will be repeated in the follow-up survey instrument.

Combine the first two digits of your current residence with the village, town, or city of your birth and the last three digits of your current postal code. For example:

My street address is 32 Plano Drive; I was born in Timmins; and the last 3 digits of my postal code are 2M5.

Therefore, my code would be 32Timmins2M5

Please type your unique code based on the instructions above in the comment box that follows: (Note: you must answer this question to move on in the questionnaire - thank you!) **[open response]**

Section 2. Open Educational Resources (OER). Items in this section relate to any type of resources you have used or might use that are open educational resources.

[Construct 1: *Attitude About OER*]

Definition: Open educational resources (OER) are digitally stored content materials explicitly openly licensed (using Creative Commons or other open licensing standard), where the creators/author(s) grant permission for download, storage, adoption, adaptation, and re-sharing as part of any learning experience. OER are available at no cost for users. Content types may include video, audio, text, textbooks, images, illustrations, animations, and simulations.

3. For the following series of questions, use the definition of OER provided and select the response that reflects your level of disagreement or agreement with the statements.

OER are easy to find in my discipline.

Strongly Disagree **Disagree** **Agree** **Strongly Agree**

I am not familiar enough with OER to answer.

4. There are many high quality OER in my discipline.

Strongly Disagree **Disagree** **Agree** **Strongly Agree**

I am not familiar enough with OER to answer.

5. I believe OER add value to the spectrum of resources available in my discipline.

Strongly Disagree **Disagree** **Agree** **Strongly Agree**

I am not familiar enough with OER to answer.

6. I am likely to use OER in my courses.

Strongly Disagree **Disagree** **Agree** **Strongly Agree**

I am not familiar enough with OER to answer.

7. I have used open educational resources (OER) in my courses.

Strongly Disagree **Disagree** **Agree** **Strongly Agree**

I am not familiar enough with OER to answer.

8. I would recommend the use of OER to other educators.

Strongly Disagree   Disagree   Agree   Strongly Agree

I am not familiar enough with OER to answer.

9. Using the definition of open educational resources (OER) listed, please select any OER you use in your courses (select all that apply).

Definition: Open educational resources (OER) are digitally stored content materials explicitly openly licensed (using Creative Commons or other open licensing standard), where the creators/author(s) grant permission for download, storage, adoption, adaptation, and re-sharing as part of any learning experience. OER are available at no cost for users. Content types may include video, audio, text, textbooks, images, illustrations, animations, and simulations.

- Images with an open license (Creative Commons or other)

- Open textbook

- Open Access journal articles

- Videos labeled with a Creative Commons license (YouTube or other video source)

- Open simulations

- Open Data

- I do not use open educational resources (OER) in my course

- Other open resources not listed above. **[open response]**

Section 3. Technology Related to Selecting Course Resources. Items in this section relate to your confidence finding and using OER.

[Construct 2 – *Perceived Behavioral Control*]

10. Definition: Open educational resources (OER) are digitally stored content materials explicitly openly licensed (using Creative Commons or other open licensing standard), where the creators/author(s) grant permission for download, storage, adoption, adaptation, and re-sharing as part of any learning experience. OER are available at no cost for users. Content types may include video, audio, text, textbooks, images, illustrations, animations, and simulations.

For the following series of questions select the response that reflects your level of agreement or disagreement with the statements.

I am confident searching the Internet for open educational resources (OER) for my courses.

Strongly Disagree   Disagree   Agree   Strongly Agree

I am not familiar enough with OER to answer

11. I am confident citing and attributing OER in my course(s).

Strongly Disagree   Disagree   Agree   Strongly Agree

I am not familiar enough with OER to answer

12. I am confident that I have supports at my institution to find and use OER.

Strongly Disagree   Disagree   Agree   Strongly Agree

I am not familiar enough with OER to answer

13. I understand open licenses such as Creative Commons.

Strongly Disagree   Disagree   Agree   Strongly Agree

I am not familiar enough with Creative Commons licenses to answer at this time.

Section 4. Use of Open Educational Resources. Items in this section related to your potential use of OER.

[Construct 3 = *Intention to Use OER*]

14. Keeping in mind the definition of OER used throughout this survey instrument, select the response that reflects your level of agreement or disagreement with the following statements.

I expect to add new resources to my courses within the next 3 – 6 months.

Strongly Disagree   Disagree   Agree   Strongly Agree

15. I will explore OER related to my courses within the next 3 – 6 months.

Strongly Disagree   Disagree   Agree   Strongly Agree

16. I will discuss use of OER with colleagues in the next 3 – 6 months.

Strongly Disagree   Disagree   Agree   Strongly Agree

17. I intend to participate in professional learning about OER if it is offered at my institution.

Strongly Disagree   Disagree   Agree   Strongly Agree

18. I intend to experiment with OER in my courses in the next 3 – 6 months.

Strongly Disagree   Disagree   Agree   Strongly Agree

19. I am interested in learning more about the following types of OER. (select all that apply)

- Images with an open license (Creative Commons or other)

- Open textbook

- Open Access journal articles

- Videos labeled with a Creative Commons license (YouTube or other video source)

- Open simulations

- Open Data

- I am not interested in learning more about OER

- Other types of OER that interest you **[open response]**

20. If you feel that your perceptions about use of OER have shifted during the study period (March - May, 2018), what changes have you noticed, and what practices have contributed to this change? **[open response]**

21. What design of professional development for educators do you believe would be most effective in supporting exploration of use of OER (e.g., face-to-face workshop, self-directed online modules, resource pages, virtual webinars, by-request support at your institution, a combination of options)? **[open response]**

Thank you for your time and care participating in this research.

If you have any questions about this research please contact the researcher, Jenni Hayman,

[email]

APPENDIX G

OPEN-ENDED QUESTIONS FROM WEBINARS

Face-to-face Participant Questions (post-workshop webinars)

• Based on the kinds of things that were talked about in the workshops, what were your takeaways?

• In terms of creating an open textbook, have you thought about collaboration in any way?

• I'm just really curious, from your perspective, what you are interested in doing about open and use of OER going forward and what questions you have still about what that looks like?

• Do you think that the two workshops, the structure of the two workshops is a valuable way of learning about OER? Is there a different way of learning that you think would have value?

• Is there anything about your Fall Winter planning that's new or different than what you had in mind before we started?

• In what ways might the materials shared for the workshops be improved?

Mid-MOOC Webinar Questions

• What can you tell me about yourself and your interest in this course?

• How are you doing with finding each other and networking in the discussion forum?

• How might we improve your course experience now that you have had a chance to explore?

• In what ways does your context differ from others in the course (local, national, discipline-specific)?

• What kinds of things are you seeing when peers go to try and adapt OER?

- Are there things that have puzzled you in the course and that you want to know more about?

- How might the timing and content of the course be improved?

- What types of networking are you doing inside or outside of the course?

Post-MOOC Webinar Questions

- What were your experiences during the course?

- In what ways might the course be improved?

- Did you connect or network with someone new during the course?

- Are there ways that your practice will be changed in the coming fall term based on this course?

- Was the course too long, too short, just right?