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Introduction to Open Praxis volume 10 issue 4

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Open Praxis is a peer-reviewed open access scholarly journal focusing on research and innovation in open, distance and flexible education. It publishes contributions which demonstrate creative and innovative research, and which highlight challenges, lessons and achievements in the practice of distance and e-learning from all over the world. This last Open Praxis issue in 2018 is an open issue that includes seven research papers and one innovative practice paper. 16 authors from 6 countries (the United States of America, United Kingdom, Canada, Kenya, the Netherlands, and Brazil) have contributed to the latest Open Praxis issue.

In the first paper (Personalizing Feedback Using Voice Comments), Kjrsten Keane, Daniel McCrea and Miriam Russell from the SUNY Empire State College (USA), explore the use of voice comment tools for providing feedback to students’ written assignments. Contextualized within the value of feedback for learning, the study surveys undergraduate online students’ perception about (voice) feedback. The results, presented in quantitative and qualitative (quotations) formats, show a majority of positive perceptions of asynchronous voice feedback, and the authors conclude with some guidelines and proposals for further research in this topic.

In the second paper (The design of an empirical cross-boundary collaborative open learning framework), Chrissi Nerantzi from Manchester Metropolitan University (UK), proposes a new framework as a dynamic design tool for academic developers. Reviewing literature, using phenomenography and collecting information from 22 Master students, the author draws a framework composed of three dimensions (engagement patterns, learning needs and design considerations). She explains each of them in detail and suggests potential implementation to different stakeholders. Published with a CC BY-NC-SA license, the promising framework requires validation yet, so the author encourages readers to use it in practice.

In the third paper (Findings from a Case Study on Refugees Using MOOCs to (Re)enter Higher Education), Gabi Witthaus from UK, presents a study on the learning experience of refugees and asylum seekers who have followed MOOC learning pathways designed by Kiron, a German non-governmental organisation. The author explains the research process in detail, based on her role as a volunteer in the organisation, and structures the presentation of the results using the revised Community of Inquiry (CoI) framework, pointing out, as well, the limitations of this framework in this particular study. The author ends highlighting some implications of the study both for refugee education and for MOOC design in general.

The next four papers relate to open educational resources (OER) in different ways. In the fourth paper (Scoping the nascent: An analysis of K-12 OER research 2012-2017) Constance Blomgren and Iain MacPherson from Canada transfer the increasing interest in OER in higher education to a level usually not covered in this journal, K-12, with the purpose of exploring which is the case at this level. They undertake a literature review focused on exploring the topics and the research methods used in 38 studies about OER in K-12. The analysis includes topic, discipline, citations, etc., and the findings show a predominance of theoretical studies. As an emerging field, the paper provides a valuable overview of K-12 OER research.

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In the fifth paper (‘Dark reuse’: an empirical study of teachers’ OER engagement), Tita Beaven, from the Open University UK, explores an understudied topic in OER research: its reuse. She undertakes a qualitative study using professional conversation with 12 teachers who use OER from an institutional repository of OER for language teaching. Her findings validate the OER lifecycle, but also evidence that the reuse of OER is often invisible and happens privately (dark reuse), thus it is not traceable by the OER repositories; which is a warning about the need of qualitative and situated approaches to the research on this topic, such as the contribution of this paper.

The sixth paper (Open Textbooks in an Introductory Sociology Course in Canada: Student Views and Completion Rates), by Heather M. Ross, Christina Hendricks and Victoria Mowat from Canada, analyzes survey-based students’ perceptions about a type of OER—an open textbook—compared to traditional commercial textbooks, and compares grades and completion rates between one same course before and after introducing an open textbook. Whilst the perception of the OER (quality, cost saving, accessibility, etc.) is positive in general, there are not significant differences in students’ performance in the course, and the completion rate is slightly higher in the course where OER was used. This paper adds evidence to current literature on the use of OER in higher education.

Closing the research papers section and the research papers related to OER, Judith Adhiambo Pete, Fred Mulder, Jose Dutra Oliveira Neto and Kathleen Ludewig Omollo from various institutions in different countries, present a second paper in a series about Differentiation in Access to, and the Use and Sharing of (Open) Educational Resources among Students and Lecturers at African universities, in this case focusing on Technical and Comprehensive Ghanaian Universities. Within the umbrella of the ROER4D project, the authors explore quantitative descriptive data though a survey-based methodology and provide an overview of the use, perceptions and intentions about OER in Ghana. They conclude with a set of recommendations derived from the study. The paper includes a remembrance from the first author, Judith Pete, to Fred Mulder, who recently passed away and to whom we also acknowledge as part of the Open Praxis community.

Finally, the innovative practice paper by Sibylle Gruber from the USA (Designing Online Curriculum: Program Revisions and Knowledge Exchange) reports on her experience in shared curriculum design in an online Master program—versus individual course design—, as a paradigm shift put into practice. Her narration of the participatory research that was used allows the readers to identify the different steps, decisions, learning and limitations they encountered in the process.

In this issue 4th issue in 2018, we specially thank all the reviewers who have collaborated in the four issues in volume 10. Their names and affiliations are listed in the full issue and in the journal website (http://openpraxis.org/index.php/OpenPraxis/pages/view/reviewer).
Personalizing Feedback Using Voice Comments

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Abstract

While text-based feedback is normally used by college instructors to help students improve their written assignments, it is important to consider using voice comment tools for further personalization. New and easily-accessible technologies provide this option. Our study focused on surveying undergraduates who received voice comments on their written assignments. Students were queried on their preferences for feedback delivery and survey questions probed student responses both quantitatively and qualitatively. Two voice comment tools were used: Adobe Acrobat Reader and Kaizena voice comments. Results showed the majority (66.7%) of students surveyed preferred the addition of voice comment feedback over written comments alone. Appendices supply tool information, full data sets and extensive student commentary regarding their experience after receiving voice comments.

Keywords: Technology; feedback; voice comments; Kaizena; Adobe Acrobat Reader

Introduction

Institutions of higher learning are using innovative options to meet the needs of their diverse student population, many of whom struggle academically, manage a disability, or have learned English as a second language (ESL). When educators rethink and retool their traditional lecture methods, all students can ultimately benefit. Questions emerge during the process, such as “how do we teach?” and “what should 21st century higher education look like?”

As educators who support students through critical writing processes, we strive to come down from the traditional “sage on the stage” role to become the “guide on the side” (King, 1993, p. 30). As distance learning becomes more prevalent, online courses utilize carefully designed learning management systems (LMS) rich with multimedia, accessible resources, authentic activities and assessments. Despite the many learning successes these environments have supported, more can be done to increase the number of students who meet course expectations in a positive learning environment.

Technological applications and add-ons outside of the LMS are an essential aspect of identifying potential responses to the questions posed above. Many tools surface that appeal to diverse learning styles and allow for enhanced skill development, easier research and greater understanding of assignments. Miller (2014) reported that “technology allows us to amplify and expand the repertoire that effective teachers use to elicit the attention, effort and engagement that are the basis for learning” (p. 11). In addition, Tcherepashenets (2015) observed the “liberating” power of technology lies “in its ability to provide personalized, individualized approach to learning” (p. 258). Equally important, individualized feedback is a significant part of the personalized approach implemented by innovative educators in the 21st Century.

The purpose of our study was to examine tools for individualizing feedback that have the potential to unleash the “liberating power” identified by Tcherepashenets (2015, p. 258). Our primary research question was “what is student perception of formative feedback when audio is added to traditional text?” We chose Kaizena and Adobe Acrobat Reader as two available technologies to implement.
in our exploration. After careful experimentation, we regularly used them in several instructional scenarios and surveyed our students to learn more about their experiences. Mainly, we wanted to know how easily students could access the audio feedback and if they had a preference for formative audio feedback over text alone.

**Literature Review**

**Importance of Individualized Feedback**

Though feedback is a complicated issue with many variables, the value of formative feedback for students is well established (Shute, 2008). In contrast to group feedback, or grades alone, individualized formative feedback provides specific comments that highlight the strengths and weaknesses of student work. Moreover, numerous studies indicate that grades alone do little to promote learning improvement (Campbell & Cabrera, 2014; Kohn, 2011; Puffrey, Buchs, & Butera, 2011). Individualization and attention to quality take learning further, regardless of the instructional mode. Whether feedback is face-to-face, synchronous, or asynchronous, attention to the affective domain using positive commentary is necessary to ensure that a student will persist in his or her efforts to learn (Bastian, 2017). Non-confirming feedback can be effective as well if it contains specific corrective information. For example, praise for the student’s personal attributes without specific examples should be avoided (Hattie & Timperley, 2007). One of the many recommendations from Shute’s (2008) extensive review of formative feedback is to take advantage of the potential of multimedia in crafting such feedback to minimize cognitive overload (p. 179). Johanson (1999) found that voice comment feedback on written assignments was a welcome addition to the practice of student-teacher conferences because of its ability to personalize instruction. Shute’s (2008) multimedia recommendation may enhance the feedback process substantially in distance learning, where face-to-face conferencing around individual assignments and tutoring is often impossible.

One of the greatest challenges for learning institutions and instructors when designing and implementing online courses is to “provide a sense of community with constructive feedback and provide open forthcoming communications as well as recognizing membership and feelings of friendship, cohesion, and satisfaction among learners” (Desai, Hart, & Richards, 2008, p. 333). Walther, Anderson, and Park (1994) determined as early as 1994 that “when cues are filtered out, communication becomes more task oriented, cold and less personal [online] than face-to-face communication” (p. 461). Casey (2008) also reported that “one of the major complaints about computer-mediated communication in general is the lack of social cues” (p. 50).

More specifically, a goal of utilizing enhanced feedback may be to establish student perception of social presence. Short, Williams, and Christie (1976) defined social presence as “the degree to which a person is perceived as a real person in a mediated situation” (p. 427). When an asynchronous instructor is available in the form of a recorded voice, feedback is more easily understood to be coming from a “real” person. Therefore, a lack of social presence might affect learners’ performance and outcomes because they don’t recognize instructor feedback as real or genuine. Social presence has also been defined as “the perceived presence or salience of others in online discussion” (What is Social Presence?, n.d.). Desai, Hart and Richards (2008) observed, “…social presence is a strong communication component that reduces isolation between the distant learner and other learners and instructor” (p. 328). Ice, Curtis, Phillips and Wells (2007) found that development of social presence was one of the key advantages of using audio feedback. In their study,

“over 450 students in courses taught by these instructors have now received audio feedback. According to these instructors, approximately one third of their students have submitted unsolicited
feedback expressing a strong preference for this technique over text-based feedback. No negative feedback has been received” (p. 19).

The authors noted that such a preference was “significant” (p. 18).

Aragon, Johnson and Shaik (2002) and Young (2006) established that student outcomes in well-designed online courses are generally similar to face-to-face classes. Indeed, Driscoll, Jicha, Hunt, Tichavsky and Thompson (2012) concluded that the quality of learning is not determined by the medium, but the course delivery pedagogy which includes feedback modalities. Instructional feedback can be as brief as a grade, or as extensive as a page of paragraphs describing the student’s strengths and weaknesses in assignment efforts. According to Ice et al. (2007), students receiving voice feedback remotely feel more involved because of a perceived decrease in transactional distance, as first identified by Moore (1997). At the onset of online education, Moore addressed the problem of the separation caused by distance between learners and instructors. He concluded, “there appears to be a relationship between dialog, structure and learner autonomy” (2007, p. 24). He further observed the benefit of increasing dialogue through the use of teleconference. At the time, teleconferencing was not easily available to students and instructors at a distance.

The Evolution of Audio Feedback

Student-instructor interaction has been shown to be the most important factor in student satisfaction with online learning in an investigation by Eom and Ashill (2016). When audio feedback is used to supplement feedback in the face-to-face classroom, student learning is enhanced with the additional advantage of being able to listen more than once (Johanson, 1999). Sloan, Stratford and Gregor (2006) maintain that students who need academic support will benefit when there is more than one mode to convey information across learning mediums. They especially noted the benefit of using voice comments along with video support as an opportunity for distance educators to meet diverse learning needs in a personalized manner that increases social cues and personal interaction (Sloan, Stratford & Gregor, 2006).

Students perceive and implement audio feedback in different and more meaningful ways than written feedback. Why? 1) it is easier to understand because handwriting is often illegible; 2) it has more depth because possible strategies for solving problems are included and the instructor can exhibit caring more easily (Merry & Orsmond, 2008).

Before the advent of online learning, Pearce and Ackley (1995) explored a number of studies of audio feedback; they were unanimous in agreement about their effectiveness and positive results. Clark recommended audiotaped feedback as “an alternative to personal conferences” not only because it saved time, but also because it is “more effective than sprinkling the essay with undecipherable, anxiety-producing marks” (qtd. in Pearce & Ackley, 1995, p. 122). They also reported that instructors recorded their oral assessments via taped recordings and sundry methods. Dental students and 9th graders, undergraduate business students and graduate students all expressed strong preferences for voice comments. Although it took a bit of time to refine their skills, instructors found that the method of recording lessons on cassette tapes was “adaptable and can be focused on important features about responding to writing...” (Pearce & Ackley, 1995, p. 32). This expanded on the earlier finding by Kirschner (1991), whose research found that the time difference spent recording the feedback compared with text was minimal, but the time instructors spent in preparing for it was significant given the available technology. Later studies found such preparation investment to be worthwhile, even as advancements in technology reduced teacher training. As recently as 2015, trends were changing: McCarthy (2015) found that “it took slightly longer” to provide written feedback than to record audio feedback (p. 166).
Klammer (1973) and King, McGugan and Bunyan (2008) testified to satisfaction on the part of students receiving recorded feedback via qualitative data. Benefits identified by the instructors included: a) time saved because speaking is faster than writing; b) avoidance of stress related to structuring a written argument; c) softened criticism; and d) encouraging tones employed. Student observations have also been positive: less cryptic feedback; motivating vocal intonations; and greater permanence compared to physical meeting outcomes (Kirschner, 1991). Pearce and Ackley’s (1995) studies confirmed similar revelations and findings. With voice comments, the tone and inflections provide additional meaning. For example, if a student writes a paragraph with two direct quotes, but cites only the first, the instructor/tutor could reply, “What is the source here?” Depending upon how the words “source here” are uttered, this could be interpreted in the text as an exasperated tone, or an acknowledgement that the instructor/tutor is sincerely interested. Wolsey (2008), found evidence to support that students prefer formative feedback embedded in their written work rather than a separate document. Research by Ice, Swan, Diaz, Kupczynski and Dagen (2010) substantiated that there is student preference for diversity in feedback since

“a marked majority or a plurality of respondents indicated a preference for a combination of written and audio feedback. However, it should be noted that at the micro level, the preference for written feedback increased significantly, indicating that perhaps a small amount of audio and a large amount of written feedback is most effective…” (p. 126).

Application to Diverse Learning Environments

Among the pedagogical approaches recommended by the National Postsecondary Education Cooperative (NPEC) is the encouragement of “various forms of electronic technologies” (Kuh, Kinzie, Buckley, Bridges & Hayek, 2006, p. 67). The addition of recorded voice technology supplies another mode of educational technology to help all students discover their strengths and weaknesses with an advantage over face-to-face conferencing: hearing the feedback more than once. Student preferences and ability to make use of the varied feedback is of interest for all educators but holds special application for educators of adults. As Knowles (1980) observed,

“...the main thrust of modern adult-educational technology is in the direction of inventing techniques for involving adults in ever-deeper processes of self-diagnosis of their own needs for continued learning, in formulating their own objectives for learning, in sharing responsibility for designing and carrying out their learning activities, and in evaluating their progress toward their objectives” (p. 56).

According to Olesova, Weasenforth, Richardson and Meloni (2011), asynchronous audio feedback is highly effective for ESL learners in addition to native speakers. In teaching English composition to ESL students, Johanson (1999), described using audio files as “Rethinking the Red Ink,” to help students construct meaning that complements face-to-face conferencing regarding written assignments (p. 33). In the process of creating the audio file, Johanson (1999) found he was becoming more of a “coach” as if in an office conference. In addition, as noted above, audio files can be played back more than once to allow multiple reviews, which is a distinct advantage over an in-person office conference.

By using voice comments, instructors provide another platform outside of the LMS to expand student learning and assessment experience. While the addition of voice comments to text would seem to be appreciated and desired, according to our review of the literature, there is a need for more empirical evidence to explore student reasoning for this preference, including perhaps a preference for a certain tool over another. Noting strategies to improve online student’s writing skills, Straub and Vasquez (2015) used the advantages of Google Docs and Adobe Connect (voice conferencing application)
for synchronous instruction, without adding an asynchronous voice feedback option. However, as the technological options for sharing audio comments expands rapidly, our research focuses on the use of two programs that have proven suitable for asynchronous academic applications: sound files in Adobe Acrobat Reader and Kaizena voice comments (Skylar, 2009; Trust, 2018).

Kaizena and Adobe Acrobat Reader embed feedback by the use of recorded audio voice comments linked to specific ideas or writing style issues within the text. In addition, they can provide nuances linked to instruction that are most easily communicated through voice while decreasing the transactional distance between the student and the instructor. Both tools have the potential to provide feedback containing a more personal tone and positive emotion. With training, feedback via these tools may also be delivered more rapidly and include additional information without increasing the time spent in the process.

Study Design

Our study was partly designed to address recommendations made by Delante (2017): “another stimulating research direction to take is to do a comparative study between online written feedback and voice/video or chat feedback” (p. 28). We initiated the study with the assumption that all surveyed students had experienced written feedback at this point in their educational studies. Therefore, student opinion was solicited on their use of one of two types of recorded audio feedback for improving writing skills within college writing courses. Along with students in regular academic online classes, students at the college who sought writing assistance through the Office of Academic Support were also asked to participate.

The three primary investigators collaborated, offering formative feedback to students between January 2016 to December 2017. The investigators used one of two technologies during the student writing process: Kaizena voice comments or Adobe Acrobat Reader, in addition to text-based feedback. As students completed the term in which they received audio feedback, they were sent a survey using Google Forms. A total of 125 students were sent the form as part of the study. The results of all survey respondents (n=44) were compiled at the end of the research period. Although differences emerged as we used them, our primary research question could be answered by students exposed to either technology: “what is student perception of formative feedback when audio is added to traditional text?”

Introduction to the Technology: Adobe Acrobat Reader

Adobe Acrobat Reader is a program for opening and reading PDF files and has proven to be useful in sharing one-way audio feedback files with students. The program is a free download that allows limited capabilities without purchase of the full Adobe Acrobat program. No account set-up or additional online hosting is required. After an instructor saves a submitted student document as a PDF file and opens with Adobe Acrobat Reader, recorded comments may be inserted where desired. The comments are represented by small speaker icons throughout the written assignment. When saved, the document and audio files become a single packaged document and may be shared back as an attachment via email or LMS.

Introduction to the Technology: Kaizena Voice Comments

Kaizena, a web-application and add-on for Google Drive, evolves and enhances the interaction between student and instructor. Kaizena voice comments are based on “conversations” around a
text which is easily available and linked within an email notification. As a result, a two-way dialogue becomes accessible online, replacing traditional face-to-face office hours as a writing assignment is reviewed in-depth. Instructors initiate feedback via text and/or audio attached to a document and students may respond in either format as well.

Kaizena audio feedback tools use the SAMR Model (Puentedura, 2014), providing four modes of learning, while Adobe Acrobat Reader features modes one, two and four without conversational replies.

1. Substitution: Instructor provides text-based comments on Kaizena and student replies to the comments (rather than a face-to-face discussion about the student’s work).
2. Augmentation: Instructor includes links to additional resources in a comment, which enhances the interactivity of feedback.
3. Modification: The instructor and student can engage in a conversation about the student’s work anytime and from anywhere. This fosters ongoing learning.
4. Redefinition: Kaizena redefines learning by means of given feedback through technology, facilitating learners to advance forward within continuous improvement (Trust, 2018).

Participants and Setting

Subjects (n=125) were undergraduates in a variety of regular academic online classes at SUNY Empire State College. The participants included international and stateside students, many seeking writing assistance through the school’s Office of Academic Support. Three investigators sent email invitations to students asking them to complete a voluntary online survey created with Google Forms regarding audio feedback on an assortment of written assignments. All participants were enrolled in one or more online courses.

Data Collection and Analysis

The survey was developed using a Likert Scale with six questions for each, ranging from two to five choices. Of the total, 12 students were identifiable as ESL. The survey was anticipated to take about ten minutes to respond to questions. No compensation was offered, 44 students responded, and 64 students did not respond. Seventeen of the 64 non-responses were the result of invalid email addresses. A second request was sent to the valid email addresses for those who did not initially respond. Our final response rate was 35%. With the use of three investigators sending surveys to students regarding feedback on written assignments for a variety of online courses, our study incorporated both investigator and environmental triangulation, as defined by Guion (2002).

Survey Results

Quantitative Results

The following charts represent the results of survey questions regarding student feedback preference received between January 2016 and December 2017.

The data in Figure 1 illustrates the number of times that the voice comment tool was accessed by survey respondents. Some respondents became more familiar with the technology than others, as access increased. Students who received voice feedback more than once were also more likely to participate in the survey over students who received voice feedback only once.
Figure 1: How often have you received feedback from your instructor on writing assignments?

Figure 2 shows that of 44 students who responded, 13.3% used Adobe Acrobat Reader sound files. A larger number (80%) of respondents accessed Kaizena voice comments. A small percentage (6.7%) could not identify the program utilized.

Figure 2: Do you know which program was used to deliver your voice feedback?

Figure 3 shows the majority of students accessing voice comments (55.6%) found the process easy or mostly easy. A much smaller percentage (13.3%) found the process difficult. As we teased out more detailed responses from the survey data, we found that 38 of the 44 respondents identified as Kaizena users while 6 identified as Adobe Acrobat Reader users. While the Kaizena user experience was similar to the chart below (Figure 3), the smaller number of Adobe Acrobat Reader responses skews their experience when reported as percentages. Of the 6 Adobe Acrobat Reader users, 3 reported difficulty with the process. (See Appendix 1: Ease of Access and Student Preferences).

Figure 3: How easily did you access the voice feedback?
Figure 4 indicates most students who accessed the voice comments did so with a PC or Mac computer or laptop. A much smaller percentage used an alternative personal electronic device. The identified iPad user was not able to access Kaizena via the device.

![Figure 4: What device/technology did you use to access the feedback?](image)

Figure 5 suggests there may be an incompatibility with using the Chrome browser to open up the Adobe Acrobat Reader PDF containing voice comments, via certain online Learning Management Systems. Four of the Adobe Acrobat Reader users could not access their audio feedback via the LMS at all using Chrome. Saving the file and opening it outside the browser with the Adobe Acrobat program provided a workaround but increased the steps and complications for feedback access between these programs.

![Figure 5: What browser did you use to access the feedback?](image)

Figure 6 indicates a strong preference for personalized formative audio feedback specifically related to students’ written work. Of the 44 students who responded, 66.7% preferred audio feedback to accompany their text-based feedback, while 33% preferred written feedback alone.

![Figure 6: Do you prefer voice comments or written comments from your instructor or writing coach?](image)
Qualitative Results

Our study included an optional written feedback section for comments (Appendix 2: Qualitative Responses).

Examples of positive views found in the comment section of the survey:

- *I thought it was great. I had a choice of recording or writing a comment. I was also able to see what specific areas you were referring to.*

- *It's great. The fact that I can hear your voice makes online courses that much more interactive.*

- *Ok I just did it and it was a lot better than reading the comments on the side it worked well and I more fully understand the comments that you made!*  

- *I loved working with the Kaizena App and hearing your remarks one-by-one was so useful when making corrections to my paper.*

- *The voice message is understood better by me. English is my second language and the wording could be slightly difficult to understand.*

- *Actually felt more like one-on-one learning.*

Examples of negative views:

- A total of three students noted that it would be easier if the voice comments were embedded in the document.

- *I prefer written comments because it is easy to edit my work as I read through.*

- *It is hard to edit my work while listening to voice comments.*

- *Would prefer if voice appeared in the Google Doc.*

Note: Since these results were compiled, the Kaizena capabilities have extended to include embedded voice comments.

Several negative responses complained about the “glitches” or lack of clear audio:

- *Some were difficult to understand.*

- *Speakers can become muffled.*

Another student noted “glitches” as well as the following addition about providing both text and voice comments: “a bit cumbersome, but both are appreciated.”

Note: It can be expected that future advances in Internet audio transmission would make the problem of “glitches” less troublesome.

Discussion

Reasons to use voice feedback abound in the literature and in the positive data results of our study. However, weaknesses were documented. In our case, “glitches” were primarily focused on access to functioning technology. Drawbacks noted by Henderson and Phillips (2015) in their study utilizing video feedback were similar: some students lacked access to videos because their computers and
devices weren’t equipped to do so. In addition, some students were concerned that they lacked the privacy required for paper revision when feedback was accessed in open office settings. Others felt some anxiety about seeing and hearing the feedback from the video, which was perceived as more direct and confrontational than written feedback by some students (Henderson & Phillips, 2015). Ice et. al (2007) stressed the importance of using the student’s name in recorded feedback, which is something often overlooked with the press of time and numbers of assignments to be assessed. A panoply of dialectics using humor and personal examples as well as generally respectful discourse can more easily personalize, encourage, and affect perspectives on student work with the addition of voice for formative feedback. Kolowich (2015) observed that video voice feedback might provide too much information that is not easily reviewed more than once. The negative comment collected in our qualitative data set echoed this observation, though we are not sure whether the comment refers to a student preference to make written edits based on written feedback or trouble accessing the audio feedback repeatedly.

Instructors who use today’s digitally provided feedback options are likely to find they spend the same amount of time delivering audio feedback as written comments alone. However, they can provide more details directed toward individualized needs within that time frame. Ice et al. (2007) also found that the time spent in creating asynchronous feedback for individual writing assignments seems to take the same duration, but in addition to noting all the errors, more positive comments and suggestions for improvement may be included via additional resources such as charts and YouTube videos. Using the Kaizena Lessons feature, more resources directed toward specific writing issues can be supplied with ease. For example, many students need extra help to avoid run-on sentences; therefore, an embedded web video lesson can provide additional instruction for that particular composition issue.

Our study supports Pearce and Ackley’s (1995) finding that “students liked or were motivated better by taped feedback” (p. 32). In addition, they noted that audio feedback was more detailed than written. According to Boling, Hough, Krinsky, Saleem and Stevens (2012), “...high levels of interaction typically need to be present for learners to have a positive attitude and greater satisfaction” (p. 119). Henderson and Phillips (2015) identified themes in their data set, including student interpretation of recorded feedback as “individualized and personal” as well as “supportive: seen as caring and felt to be motivating” (p. 58). Students appreciated the degree of detail provided in terms of how their work was evaluated.

Positive student perceptions of the feedback technology are further anchored by rapidly advancing technological capabilities. Newer tools like Kaizena voice comments are saved directly in a Google Document where students can apply the recommendations immediately in their written assignments. A major hurdle may be in keeping abreast with new versions of digital feedback as they occur. Accordingly, despite the mounting evidence to support use, few instructors are providing technically enhanced feedback (Khalil, 2013; Kolowich, 2015). Harvey and Broyles provided a list of 20 resistance factors along with an antidote for each that should be considered (qtd. in Khalil, 2013). As more accessible tools become available, greater instructor usage could be expected. In fact, Lunt and Curran (2010) predicted that enthusiasm toward the use of audio feedback tools would be used to substitute for face-to-face conferencing. The Kaizena add-on voice comments agree to the extent that they characterize the feedback and replies as “conversations”. Feedback as dialogue means that the student not only receives initial feedback information, but also has the opportunity to engage the teacher in discussions about that feedback.

Crews, Bordonada and Wilkinson (2017) urged online instructional designers and instructors to encourage student feedback regarding their online content and courses as well as for their own assignments. Tait (2014) predicted that, given the newer technologies, “new entrants to e-and online
learning will leapfrog their predecessor with an improved student experience” (p. 15). While there may be some minor technological “glitches,” as with all internet tools and personal computing, our study results strongly suggest that voice feedback tools are a positive addition to the instructional process. Exploring more than one tool provided further support for this suggestion. Kaizena voice comments and Adobe Acrobat Reader are both able to provide formative feedback with detailed instruction in grammatical or essay structures for written assignments. Truly, enhanced feedback with recorded voice comments has been shown to be an asset to learning.

Conclusions

Developing formative feedback through voice comments can be a powerful tool to develop greater self-motivation for online learning. Our investigation supported the advantages of voice comment feedback over text alone. Formative audio tools are timely and efficient and provide authentic high-quality observations encouraging dialogue that is engaging and rich in quality as well as quantity (Merry & Osmond, 2008). In this study’s survey comment section, one student saw the voice tool as saving time for both students and instructors, noting, “It is quick...a new approach on hearing both in voice, but not taking up time of both when one or the other is occupied…” Audio files are permanent, enabling a student to review the original feedback as needed, which is a distinct advantage over face-to-face conferencing. The asynchronous voice feedback format applied in our study also met the requirements of Chickering and Ehrmann’s (n.d.) seven principles for delivery methods requiring technology to:

1. Encourage contact between students and faculty.
2. Develop reciprocity and cooperation among students.
3. Use active learning techniques.
4. Give prompt feedback.
5. Emphasize time on task.
6. Communicate high expectations.

Our findings have provided direction for future research. Specifically, the following questions can be rich investigative opportunities.

- How does audio feedback encourage more instructor-student dialog about written student work?
- Some instructors complain that students seem interested only in their grade, while eschewing narrative written feedback. Does the addition of audio feedback make students more likely to access and absorb instructor suggestions?
- Does the use of audio feedback make students more likely to apply the suggestions to their assignments over the use of text-based feedback alone?
- Does applying voice feedback take more or less time than written feedback?

Timely formative feedback can benefit future “thoughts, feelings and/or actions” (Getzlaf, Perry, Toffner, Lamarche & Edwards, 2009, p. 4). Indeed, audio feedback may propel students forward into a series of overall positive and successful learning experiences. In reflecting on his own research comparing the kinds of feedback given, Delante (2017) recommended “a comparative study between online written feedback and voice/video or chat feedback” (p. 28). This study partially fulfilled that inquiry and supports the increasing effort by instructors to use recorded voice comments for more
effective formative feedback. Our results point to a preference regarding the use of audio feedback specifically related to text in written assignments. Additional investigations into the effectiveness of using voice comments to personalize formative feedback should yield similar results, further supporting our assertion and the continued goal of promoting social presence and narrowing transactional gaps in online learning.

References


Appendix 1. Ease of Access and Student Preferences - Quantitative Responses

Table 1: Question #3 Kaizena Responses

<table>
<thead>
<tr>
<th>Kaizena ease of access</th>
<th>number of students</th>
<th>prefer voice comments</th>
<th>prefer written comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easy</td>
<td>22</td>
<td>16</td>
<td>6</td>
</tr>
<tr>
<td>Mostly easy</td>
<td>10</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Neither difficult nor easy</td>
<td>4</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Difficult</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Not able to access (iPad)</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>37</td>
<td>25</td>
<td>12</td>
</tr>
</tbody>
</table>

Note: Out of 37 students receiving Kaizena voice comments, 12 preferred written comments and 25 preferred voice comments. One student could not access the voice comments using an iPad. Four found access neither difficult nor easy. Ten found access mostly easy and the largest percentage (n=22) found easy access.

Table 2: Question #3 Adobe Acrobat Responses

<table>
<thead>
<tr>
<th>Adobe Acrobat ease of access</th>
<th>number of students</th>
<th>prefer voice comments</th>
<th>prefer written comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easy</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Mostly easy</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Neither difficult nor easy</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Difficult</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Not able to access</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>6</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

Note: Out of 6 students receiving Adobe Acrobat comments, 2 preferred written comments.
Appendix 2. Ease of Access and Student Preferences - Qualitative Responses

Note: Responses to survey questions 7 and 8 are reported together for each student, identified by a number for data purposes. #15 was the only student using an iPad and #21 and #22 were the respondents who used Smartphones.

Responses to questions:

7. Additional comments about receiving Kaizena voice feedback on your writing.
   #7 less intrusive
   
   #15 written feedback was much easier, because the voice feedback is difficult to download in the iPad
   #17 If editing could be done on the same page with the comments, it will be better than the written comments. I prefer written comments because it is easy to edit my work as I read through. It is hard to edit my work while listening to voice comments as I have to alternate the browser.
   #21 (Student identified with English as a Second Language) I enjoyed it. It is quick in my point of view on the professor and the student. A new approach on hearing both in voice but, not taking up time of both being on the phone. When one or the other is occupied they can both be responsive on their time. The voice message is understood better by me. English is my second language and the wording could be slightly difficult to understand.
   #25 Some of the voice comments were difficult to understand
   #26 I would prefer to have the written comments on my document because then I could save the document to look at afterwards. The comments on Kaizena also don’t attach the voice comments on the document’s intended location. For example, I have noticed I would receive a comment on how I should reword a certain sentence, but I don’t know where to look since I only have her voice to show me. The feedback is helpful but I would prefer the comments to be written. If there was anyway to save the feedback to my computer with the locations being discussed, then I wouldn’t mind using Kaizena
   #28 Easier to read then listen to because speakers can become muffled.
   #29 They were helpful but, there were some issues. (Glitches) So I can see and process the comments better.
   #30 Written comments were Easy for me to understand.

8. Could you explain why you prefer one or the other?

#22 They are more informative than voice comments. I am more of a visual learner.

#23 I find the written comments easier to read, write back, and edit.

#24 I find the written comments easier to read, write back, and edit.

#25 Some of the voice comments were difficult to understand

#26 I would prefer to have the written comments on my document because then I could save the document to look at afterwards. The comments on Kaizena also don’t attach the voice comments on the document’s intended location. For example, I have noticed I would receive a comment on how I should reword a certain sentence, but I don’t know where to look since I only have her voice to show me. The feedback is helpful but I would prefer the comments to be written. If there was anyway to save the feedback to my computer with the locations being discussed, then I wouldn’t mind using Kaizena

#28 Easier to read then listen to because speakers can become muffled.

#29 They were helpful but, there were some issues. (Glitches) So I can see and process the comments better.

#30 Written comments were Easy for me to understand.
The design of an empirical cross-boundary collaborative open learning framework

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Abstract

This paper reports on the design and development of an empirical cross-boundary, collaborative open learning framework for cross-institutional academic development. The framework is one of the key outputs of a phenomenographic study into the lived experience of open learners in two open cross-institutional courses. Data was collected through individual interviews from 22 study participants from two courses that made up a collective case study. These courses were offered by UK higher education institutions in collaboration with informal partners nationally and internationally and were selected as these had different collaborative learning features built-in that could be explored. Course participants in these two courses include academic staff who teach or support learning and further open learners. The empirical design framework is proposed to support the development and implementation of cross-boundary collaborative open learning approaches within cross-institutional academic development and may also be useful in further learning and teaching settings in higher education.

Keywords: Open education, academic development, collaborative open learning, boundary crossing, design framework, phenomenography

Introduction

This study is in an emerging area of open education where relatively little evidence-based research is available linked to academic development. It therefore presents an alternative academic development proposition.

Learning is generally becoming more collaborative and informalised (Redecker et al., 2011) and the boundaries between formal and informal learning are blurring (Conole, 2013). This realisation, together with the call for more openness and cross-institutional collaboration, formal and informal, among Higher Education Institutions and practitioners in the area of teaching and academic development (British Council, 2015; European Commission, 2013, 2015; HEFCE, 2011; Inamorato dos Santos, Punie & Castaño-Muñoz, 2016) to enhance the quality of teaching based on collaboration among institutions and collaborative learning, were important drivers for this study.

The literature, specifically in the context of academic development in the UK, highlights the need for more outward-facing (Crawford, 2009), technology-supported academic development (Pickford & Brown, 2013) following collaborative and open approaches that stretch beyond institutional boundaries and engage academic staff in CPD to enhance teaching practice and the student learning experience. Nevertheless, open cross-institutional academic development is still currently in an embryonic state. The modelling of such practice, supported by technologies and fostering opportunities to engage as learners, has the potential to better prepare staff to harness these technologies and practices in their own teaching (Bates & Sangra, 2011; Donnelly, 2010; Littlejohn, 2002). Stefani (2017) highlights the need for academic development to become transformative and shake up practices.
The literature indicates that design frameworks and models can shape positively collaborative learning enabled and supported by digital technology (Conole, Galley & Culver, 2011; Mayes & de Freitas, 2013; Reeves & Reeves, 1997). Therefore, a review of range of well-known and widely used theoretical and evidence-based design frameworks that support teaching using digital technologies with collaborative learning features was conducted. The frameworks reviewed were mainly from the higher education context. This helped to identify what is already available and in use that could also be of relevance for this study.

The frameworks reviewed included among others, the 5-stage e-tivities (Salmon, 2000; 2013) also appropriated as the 5-stage framework for online e-groups (Jaques & Salmon, 2007), the 3E Approach/Framework (Smyth, Comrie, Gray & Mayes, 2010), Communities of Practice (Lave & Wenger, 1991) and the Community of Inquiry (Garrison, Anderson & Archer, 2000). These and further frameworks reviewed (see Nerantzi, 2017) discuss scaffolding strategies to enable and promote learner interaction and active engagement. In some cases, collaborative learning is explored in a variety of settings from blended, technology-supported and fully online provision, in formal or informal educational settings, as well as in Massive Open Online Courses and Open Educational Practices.

The reviewed frameworks highlight the importance of facilitator support, the community, the activities, and the choice between learning on one’s own or with others. However, none of the frameworks reviewed was designed with a primary focus on fostering collaborative open learning in cross-institutional academic development settings. The closest approach to the current study was the 10 Dimensions of Open Education framework (Inamorato dos Santos, Punie & Castaño-Muñoz, 2016). This framework has been designed to support the implementation of open education at institutional level enabled among others through collaborative learning and cross-institutional collaboration. However, this framework does not provide specific pedagogical approaches that enable and foster collaborative open learning.

The review of frameworks demonstrated that new design frameworks are needed to respond to the fast pace of change in HE, to model innovative practices in academic development and maximise on the potential open and social practices present in this area for staff and students.

The study: methodology, data collection and findings

This paper reports on the design of the cross-boundary collaborative open learning framework, a key output of an empirical study in which the authentic lived collaborative open learning experience in cross-institutional academic development settings was explored.

Phenomenography was the methodology used as the study aimed to explore the lived experience of study participants collectively and its qualitatively different variations in authentic settings in (Marton, 1981). It is a relatively new methodology especially developed for pedagogic research in higher education that is increasingly used to study the student and staff experience (Nerantzi, 2017). Booth (1997) highlights that the results of phenomenographic research are valuable to inform practice. Something that was intended with this study. Through a collective case study approach (Stake, 1995), experiences across two distinct open cross-institutional courses were explored. These were the open courses Flexible, Distant and Open Learning (case study 1: FDOL) and Creativity for Learning (case study 2: #creativeHE). Both are institutional modules at Masters level at universities in the United Kingdom with collaborative learning features offered through social media technologies, supported by distributed facilitators. An overview of the case studies with the specific collaborative learning features can be found in Appendix 1.
In total, 22 study participants who were learners in either of the two courses of the collective case study were interviewed remotely through individual semi-structured interviews (11 from case study 1 and 11 from case study 2). The study participants were from different higher education institutions and other sectors, from a range of disciplines and professional areas and different countries and did include some students. Most study participants were highly qualified with at least a Master's qualification. The transcripts of these individual interviews collectively formed the phenomenographic data that was analysed through an iterative process as described by Marton (1981) through which the categories of descriptions emerged. Bracketing strategies such as keeping a reflective diary during the analysis and sharing the transcripts and the findings with study participants, were used to reduce and minimise data contamination by the author, suspend judgement and provide transparency to the process were employed as the researcher in phenomenography is not part of the study (Adawi, Berglund, Booth & Ingerman, 2001; Sin, 2010).

There were 11 categories of description in total organised in three pools of meaning: course, boundary crossing and collaboration. The categories of description included there are the findings of the phenomenographic study as reported in Appendix 2. The categories of description were synthesised into the outcome space. This depicts the logical relationships among the categories of description and is regarded as the final stage of the analysis in a phenomenographic study. The outcome space has been included in Appendix 3.

The Framework

The framework is a dynamic design tool for academic developers, through which key characteristics of collaborative open learning as a learner choice in cross-institutional courses have been identified and synthesised. This empirical design framework is a direct output from the phenomenographic findings, the categories of description (Appendix 2), the outcome space, the final output of a phenomenographic study (Appendix 3) and a discussion of relevant literature (Nerantzi, 2017) and is intended to be used as a design tool.

While boundary crossing was introduced originally in an attempt to explain what professionals experience at work that is unfamiliar and individuals feel unqualified to deal with it (Suchman, 1994), Akkerman and Bakker (2011, p.132) state that “all learning involves boundaries” and crossing them. They claim that the increase in specialisation in professions is leading to the increase of boundaries and potential fragmentation. They emphasise that it is therefore important for education to create opportunities for boundary-crossing as this will bring continuity and diversity within and beyond a higher education institution.

Boundary crossing was a key characteristic that emerged through the analysis and synthesis of the phenomenographic findings and is reflected particularly in four categories of description that define boundary crossing in the context of this study. These categories are modes of participation; time, places and space; culture and language; diverse professional contexts. How these categories and the qualitatively different variations relating to these were experienced by study participants, can be found in Appendix 2.

The empirical design framework will require contextualisation and adaption before application. It has not been used in practice.

The framework consists of the following three dimensions: Engagement patterns, learning needs and design considerations. Figure 1 is a visualisation of the framework and a quick reference guide intended to be used for designers. All features presented in this are described in more detail in the following sections.
Engagement patterns

The engagement patterns included in the framework associated with collaborative open learning are, ‘selective collaboration’ and ‘immersive collaboration’. They are well supported in the phenomenographic outcomes and reflect the category of description ‘collaboration as engagement in learning’ as depicted in the outcome space in Area B: Lived experience (Appendix 3). These two engagement patterns provide insights into the learners’ activity and behaviour in the context of the collective case study.

The qualitatively different variations are captured in Figure 1. The results indicate that the engagement patterns are dynamic. This means that learners may move between these two identified patterns.

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The level of learners’ engagement with others, and their participation in asynchronous or synchronous group and course activities and associated support strategies will vary. Furthermore, learners can behave differently online and offline. For example, a learner may seem to be a ‘selectively’ collaborating online within the course, but offline in a local setting, he or she may be part of an ‘immersive collaboration’ enjoying the benefits of an existing trusted community. When organising groups and collaborative open learning, it is important to take these different engagement patterns into consideration as they will affect group work and there may be tensions especially between ‘selective collaboration’ and ‘immersive collaboration’. Making learners in groups aware of these issues and monitoring engagement patterns could be considered as a way of reducing potential challenges and misunderstandings among group members.

The engagement patterns, depend on personal circumstances, interests, preferences, challenges and constraints and these can all change. This is consistent with White and Le Cornu’s (2011) Visitors and Residents Typology. As some learners can be less visibly engaged with others online in the course, it needs to be acknowledged that these individuals, especially when adopting ‘selective collaboration’ can have other support, engagement and collaboration strategies in place which sit outside the course. These could be other online communities or offline formalised or informal support networks or communities as the findings of this indicated. Such information can be included in the learner profiles kept and shared by learners in an online space related to the course.

Providing clear course guidelines for learners is important, as is having facilitators who are engaged where needed. Proposed support measures can be found in the framework under design considerations, and these have been shown to lead, progressively, to learner autonomy.

Learning needs

The learning needs (Figure 1) of participants also differ across the two distinct engagement patterns, ‘selective collaboration’ and ‘immersive collaboration’.

The learning needs dimension of the framework is a guide for academic developers, course designers and facilitators to design and facilitate collaborative open learning and provide engagement activities that may be appropriate depending on particular engagement patterns.

Figure 1 shows the needs linked to the corresponding engagement pattern. The learning needs are aimed at providing a guide for academic developers during the design stages of a course to help them develop appropriate activities that will be suitable for each need. This will potentially increase the engagement in collaborative open learning and in learning more generally. Furthermore, these activities can also be useful for facilitators to adjust support strategies in collaborative open learning. They may also help learners identify ways to engage in a course depending on their circumstances, or the engagement pattern.

As learning needs are linked to the corresponding engagement patterns it is recommended that academic developers make clear from the outset what level of commitment is required from learners for each pattern. This is especially important for those learners who intend to engage in collaborative open learning in supported groups, and to clarify the nature of the work involved. Learners can be asked to identify which engagement pattern would be more appropriate for them, depending on their circumstances at a specific moment in time. This could help them manage their engagement more effectively and realistically depending on their circumstances. However, there is an adverse potential for a learner to ‘lock themselves in’ to an engagement pattern and then become less open to change. Being aware of learners’ needs may help facilitators and learners to reduce potential challenges experienced in collaborative open learning in groups, especially where a higher level of commitment to others is required or expected.
**Design considerations**

The design considerations are course characteristics that foster collaborative open learning. They emerged from the phenomenographic study and are presented below.

**Collaborating institutions**

Collaboration between institutions in this study was informal and practitioner-led. It was conducted without formal cross-institutional agreements. This approach is in line with what M. Weller (2011) defines as ‘little OER’ and Rennie and Reynold (2014) as ‘Bottom-up OER’. Practitioner-led cross-institutional initiatives could also be formalised through cross-institutional agreements and therefore be turned into ‘Big OER’. Such a step can have implications for the flexibility, quality and sustainability of the initiative and therefore further research is needed in this area.

In order to find collaborators, an academic developer or course designer first needs to identify individuals in at least one other HEI who would be interested in such a collaboration. Individuals from an HEI in another country can be considered for greater diversity.

**Organisation and facilitation team**

A team approach to organisation and facilitation among collaborators from different institutions was used in both courses of this study. The outcomes linked to facilitation and the distributed team approach suggest that this had a beneficial effect on participants’ engagement in collaborative open learning, and reduced some of the ‘top-down’ managerial perceptions around academic development (Di Napoli, 2014). Therefore, it is suggested that a distributed and collaborative approach should be considered as it could alleviate potentially negative perceptions of academic development.

Collaborators need to agree on the details of the course, such as its organisation including the structure, scheduling, approaches, and activities, as well as define and agree an appropriate evaluation strategy.

The role that facilitation has played in this framework suggests its importance in OEP in the context of academic development, and the difference it can make for collaborative open learning in these settings. A supportive environment where facilitators are present and engaged, and in which they are co-learners, builds confidence among learners and reduces their anxiety around contributing. The study also indicates that facilitators play an important role in overcoming challenges related to technology and language for example, and that facilitation should therefore be acknowledged as an important aspect of OEP.

On the matter of defining a course language, even if collaborators originate from the same country, open learners may still be from a wider range of countries with different first languages and varying levels of competencies in the course language. As this study has shown, a defined language can therefore be a barrier for some to participate in collaborative open learning. It is important to acknowledge this and identify strategies to help learners overcome or minimise any barriers from the outset. Language learning resources or a buddy system for example, could be considered. S. Weller’s (2011) work points to a general lack of familiarity with educational research language among academic staff in other disciplines. Facilitation can also contribute positively to this.

**Resources and tools**

A range of resources, social media and digital tools for collaborative open learning were used in the two courses studied. The outcomes suggest the importance of using media-rich resources.
alongside text-based resources as they provided varied and flexible engagement opportunities. These supported participants’ learning, especially where English was not the first language, there were learning difficulties or time issues.

While the social media and digital tools used presented initial technological challenges for some participants, these were overcome with peer and facilitator support. These outcomes seem to be consistent with the idea that social media is a vehicle for open learning (Weller, 2014).

Challenges are especially acute during the initial stages of a course when learners first encounter the resources and tools. Providing clear guidelines that help learners familiarise themselves with these, and which help them navigate through the course, is important for developing confidence in learners.

Further challenges for collaboration would be expected due to varying levels of proficiency in the defined course language due to the openness of the provision, as discussed in the organisation and facilitation team section above.

Finally, making all course areas and resources available from the outset of the course and after course completion increases and extends flexible engagement, since, as the study suggests, learners engage in different ways with the course.

**Formal / Informal learning & Accreditation / Recognition**

Conole (2013) has noted that the blending of formal and informal learning has started happening in HE. Examples of this in practice are the two courses of this study. Formal and informal learning opportunities were part of the design due to its open nature. Courses were linked to formal institutional modules in at least one of the participating institutions. This enabled the bringing together of formal and informal learners in a cross-institutional academic development context. This blending or blurring of modes of participation had a positive impact on collaborative open learning for both informal and formal learners in the two courses of this study, and was often seen as motivational.

Furthermore, this study shows that the opportunities for accreditation and recognition presented by the courses became increasingly important for some participants due to their level of engagement in these. While informal recognition, in the form of a certificate, badge or other notification of participation was seen as appropriate for some, other participants, were interested in how they could use the course towards gaining academic credits, a qualification or a professional recognition. Some participants had the opportunity to use the course to complement their studies elsewhere or work towards recognition external to the course. Further research in this area is required to establish how informal and open learning in the context of academic development can be recognised.

Johnson et al. (2016) state that there are associated opportunities for HE brought about by the blending of formal and informal learning, especially around the role of informal learning for formal learning and qualifications. The outcomes around recognition and accreditation in this study suggest that there is value in bringing together formal and informal learning in the context of academic development. If the provision is part of an existing academic programme that has been opened-up, it will already have in place accreditation and recognition strategies and related summative assessment for learners who are interested in working towards recognition or academic credits. However, the outcomes point towards the need to identify pathways that lead to academic credits or recognition, especially for open learners, as the certificates and open badges may not be appropriate or desirable in all cases.

This study indicates that it may be appropriate that any formal opportunities for accreditation or recognition are dealt with at institutional level and not cross-institutionally, because in a practitioner-led collaboration there will be no formal agreements in place. Even if there were, a joint recognition
or accreditation process for open learners would add a layer of complexity which may not be helpful when designing, and offering open courses of this nature. Research in this area will provide related insights to inform practice.

**Learner profiles and cross-boundary considerations**

Open provision without prerequisites increases diversity and cross-boundary representation of learners as this study suggested. Such courses have the potential to attract academic staff and students from other institutions from the same and other countries and cultures, as well as individuals from outside HE. This study takes Perryman’s and Coughlan’s (2013; 2014) informal academic and public subject communities using social media, and shows that such cross-boundary communities can also work when bringing together formal and informal learning of academic staff, students and the public in an academic development context. Such practices add another dimension to the diversity of learners.

Knowing who the learners are and their expectations is important for facilitators to support participants in collaborative open learning. The information that provides insights into the demographics of learners as well as their intended engagement patterns and details regarding any existing additional and/or external support in place, could be shared with facilitators and peers in the course, with learner’s consent, especially as generally less information will be available for open learners compared with learners who will be registered from a particular institution. The creation and use of learner profile spaces could be considered for gathering relevant information about collaborative open learners that will be useful for facilitators and peers during the course and should be constructed following data protection guidelines. Alternatively, reflective individual, group portfolios or group resumes could provide this information when shared with others on the course.

**Learning and teaching approach**

This study has shown that inquiry-based learning and teaching approaches engage learners in a meaningful and critical way, enabling contextualisation. Many participants enjoyed and valued learning through inquiry especially as this enabled them to link learning to their own practice.

Overall, it is recommended that flexibility and choice are built into the teaching approach, so that it is not overly structured and predefined, and gives facilitators and learners freedom to make learning suit their needs. This study suggests that when open learners take ownership of the learning process, this may translate into increased engagement.

**Group work and community**

Learning in facilitated small groups was an option in the courses of this study. There were additional options for learners to learn on their own or with others in the course community. These arrangements added flexibility for learners to engage. This study suggests that supported small groups have a positive impact on engagement. The results also point towards an increased interest in collaborative open learning when the group members, and the voices and perspectives they expressed, were diverse. Therefore, when creating groups, mixing learners from different institutions, backgrounds, roles and cultures is recommended as it will increase diversity and might influence individual engagement patterns. The development of strategies for group formation that foster cross-boundary collaborative open learning can assist in achieving this. Some learners might need more support than others and time is needed to form groups. These requirements should be recognised and built into the course.
Perceptions of facilitation in this study and especially the sometimes directive and controlling aspect of it, indicate that it is important to create a scaffold that will lead to group autonomy as time progresses. This would help learners get the maximum out of collaborative open learning and open learning more generally. The approach adopted for collaborative open learning needs to be owned by the group members. In addition, while it is often desirable in collaborative learning to produce a group output, this study indicates that this can be problematic, since engagement fluctuates and individual priorities can be conflicting. Therefore, the suggestion is to consider approaches that focus more on the process of collaborative open learning.

Scheduling when the group gets together is important and will help group members get to know each other which, in turn, will have an impact on their interaction and learning within the group. In particular, using synchronous video links where individuals can see each other, can create a sense of belonging among group members and enable them to learn together in real time. Creating opportunities for learners to be part of a community within a group as well as at a course level is an important design consideration identified through and in the literature (Kear, 2011). A community enables ‘immersive collaboration’ and ‘selective collaboration’, as well as ‘individual learning’. This happens if or when learners want depending on their personal circumstances and preferences.

Online / offline mode

The mode of engagement provided insights into where participants experienced collaborative open learning and how they engaged more generally in the open course.

The potential offline learning in an open course is often not acknowledged (Wall, 2015). The outcomes especially around ‘cross-boundary learning through time, places and space’ provided an insight into the role offline learning played for some participants and their learning. They indicate that offline was often preferred or at least complimentary to online and mobile learning as it enabled participants to engage differently and be supported locally. The knowledge that learners engage in offline activities could provide a possible explanation of why some participants might be less visible online within groups and the course more generally. This information can help manage group expectations and collaborative open learning. It is recommended that academic developers, course designers and facilitators take online and offline modes of engagement into consideration when planning, designing and supporting collaborative open learning in cross-institutional academic development courses, even if such information is not known.

Course outcomes and activities

The courses of this study had broad outcomes, which were accompanied by a range of various learning activities. These could be used in groups or individually. Peers and tutors commented on contributions and learners were encouraged to personalise the learning outcomes.

Structuring the course based on broad learning outcomes and offering a small set of activities linked to course themes that can be used and adapted individually or collaboratively, online or offline, was seen as beneficial for participants especially as time for engagement was often an issue. Keeping instructions for activities short and clear is therefore recommended.

Furthermore, designing activities that are inquiry-based and which can be contextualised and completed in a variety of media enables alternative forms of engagement. The use of video for reflection is such an example. Using a wide range of media is important for a number of reasons, including: the possible engagement difficulties that some learners will encounter because of
language barriers; learning difficulties, time constraints; and personal preferences. This study shows that media-rich approaches work well and learners enjoy sharing and commenting on each other’s contributions.

**Timing and Scheduling**

The nature of collaborative open learning is shaped by the duration of the course. In courses that stretch over a longer period of time there is more time available to develop learning relationships in groups, which is important especially for ‘immersive collaboration’.

Scheduling synchronous and asynchronous activities for all learners and at group level early on in the course and throughout is important as this helps learners manage their time from the outset. Qualitatively different engagement patterns were identified through this study that provide insights into different behaviours as well as needs. Providing guidelines for required study time per day or week depending on the length of the course should also be considered. Furthermore, this study indicates that some participants wanted to keep in touch with peers after the course had been completed and to feel part of a community. Providing extended engagement opportunities beyond the course duration can be beneficial and should be designed-in from the beginning.

**Recommendations for specific groups**

This empirical design framework has shown that collaborative open learning can be powerful for engaging academic staff in pro-active professional development. It can bring together a wide range of individuals from different cultures, sectors and professional roles, including students, and others from outside higher education turning it into a boundary crossing experience. Furthermore, the framework presents opportunities for academic staff to become part of a diverse cross-institutional learning community that has the potential to live beyond course boundaries, and therefore strengthens relationships among academic staff in different institutions. In addition, the framework may bring value to course designers in other professional areas where the advantages of cross-boundary learning can also be harnessed.

The framework may present potential opportunities to a range of groups, each of which are considered below.

**Academic developers**

Collaborative open learning in cross-institutional settings is an approach for academic developers to consider in their practice that potentially creates a new type of CPD and brings more diverse individuals together. This can be motivational, not just for those participating but also for those co-organising and co-facilitating such a provision. It also presents valuable development for academic developers themselves as such initiatives provide opportunities to work with colleagues and individuals from different institutions, cultures and sectors.

**Academic staff**

It is recommended that academic staff first experience collaborative open learning as a learner and at a later stage take on co-facilitator responsibilities. By experiencing challenges and opportunities first-hand as a learner, they will develop a deeper understanding of what it is like to learn in such an environment and how to support others, before adapting similar approaches into their own practice.

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The design of an empirical cross-boundary collaborative open learning framework

Students in Higher Education

There is an opportunity for students, especially at postgraduate level, to learn in partnership with academic staff and other professionals from other sectors and cultures, in an environment characterised by horizontal communication and collaboration. Such activities can have a positive effect on students’ motivation to learn and study, and increase students’ confidence and sense of belonging.

Professionals from other sectors and the public

This includes those from sectors such as secondary or further education, the voluntary and corporate world and the public more widely, who all have an opportunity to learn and develop within a diverse community with shared interests. Furthermore, it creates connections and opportunities for diverse collaborations, and a link between sectors and the public, which, as this research has shown, is vital for cross-fertilisation of ideas and knowledge creation.

Researchers

As the framework brings together a range of dimensions and features around collaborative open learning, it may also be a useful starting point for researchers to generate new ideas for further research. Therefore, it could be used as a tool to further explore particular areas of inquiry linked to this.

Limitations of the framework

Further work is needed to validate this empirical framework. Although it has yet to be formally tested, its potential usefulness in practice has been noted. Following development, the framework was shared with eleven colleagues in a wide range of roles from different parts of the world for open peer review. This strategy is aligned with phenomenographic practice and provides external scrutiny and judgements to be made by the researchers’ wider community of the interpretations in the phenomenographic analysis. Their comments support the usefulness of the framework for practice in a range of learning and teaching contexts, within and beyond academic development. At the time of writing this article, the framework is considered by a UNESCO supported project Open Education for a Better World to be used nationally at an Uzbek University in the context of the professional development programme that leads to the re-accreditation of English language academics that has to be taken every three years to address some of the challenges in their current provision (Wahls, Nerantzı & Abidjanov, 2018).

Licensing of the framework

The release of the framework under a Creative Commons licence (CC BY-NC-SA) enabling adaptations, will encourage others to test the framework, evaluate it and further contribute to the knowledge base around collaborative open learning and open cross-institutional provision. This will be of value for practitioners and the sector more widely. Currently, it has been proposed to be adapted in Uzbekistan for implementation within the professional development accreditation programme for English language teachers in higher education through an UNESCO supported project that is part of the programme Open Education for a better world (Nerantzı, Wahls & Abidjanov, under review).
Conclusions
The empirical cross-boundary collaborative open learning framework has been designed and developed based on the phenomenographic findings of this study and informed by critical engagement with the literature. The framework dimensions were presented in detail in this article. These are the engagement patterns, learning needs and design considerations. At the heart of the framework are the dynamic engagement patterns, ‘immersive’ and ‘selective’ collaboration. These provide insights into the collaborative open learning experience as identified through this phenomenographic study. The learning needs provide a scaffold for learning activities and support that will help learners navigate on their own and with others within open learning and maximise the benefits of collaborative learning depending on their situation, preference and priorities. It is hoped that the framework, will provide a useful guide and design tool to academic developers, learning technologists and course designers interested in introducing, implementing and reviewing collaborative open learning within academic development. The framework may also be of interest in further disciplines and professional areas in an higher education context and open education mode widely and could be considered as a tool for further research around collaborative learning.

Acknowledgements
The author would like to thank her supervisors Dr Sandra Cairncross and Prof. Keith Smyth for their help during her doctoral studies as well as Prof. Margy MacMillan and Dr Peter Gossman for reading the first draft of this paper as well as the reviewers for their valuable suggestions and Elizabeth Walshaw for creating the visualisation of the framework used in this article.

References
The design of an empirical cross-boundary collaborative open learning framework


Appendix 1: Case studies overview

<table>
<thead>
<tr>
<th>Commonalities of cases</th>
<th>Case studies</th>
<th>Case study 1: FDOL132 University of Salford, Karolinska Institutet and Manchester Met</th>
<th>Case study 2: CreativeHE Manchester Met, London Metropolitan University, University of Macedonia, Creative Academic and Lifewide Education networks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration in weeks</td>
<td>12</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Dates</td>
<td>Sep – Dec 2013</td>
<td>Sep – Nov 2015</td>
<td></td>
</tr>
<tr>
<td>Collaborative design characteristics</td>
<td>Optional, in small groups using PBL</td>
<td>Optional, in small groups or pairs using a variety of pedagogical approaches agreed with learners</td>
<td></td>
</tr>
<tr>
<td>Course development</td>
<td>Collaborative: University of Salford and Karolinska Institutet</td>
<td>Manchester Met</td>
<td></td>
</tr>
<tr>
<td>Recognition for open learners</td>
<td>Certificate of participation</td>
<td>Open badges for participation</td>
<td></td>
</tr>
<tr>
<td>Formal study option</td>
<td>At the University of Salford: approved Flexible, Distance and Online learning module at postgraduate level as part of the PgCert in Academic Practice. At Karolinska Institutet: Part of study towards the accredited development courses 2-weeks or 5-weeks.</td>
<td>At Manchester Met: Part of the Creativity for Learning module, option to also use work towards FLEX 15 or FLEX 30 modules. All three are part of the MA in HE. University of Macedonia: part of MA in Lifelong Learning</td>
<td></td>
</tr>
<tr>
<td>Study linked to further local engagement opportunities</td>
<td>n/a</td>
<td>London Metropolitan University: part of Take5 initiative.</td>
<td></td>
</tr>
<tr>
<td>Languages</td>
<td>English and Swedish</td>
<td>English and Greek</td>
<td></td>
</tr>
</tbody>
</table>
### Appendix 2: The categories of description and their qualitatively different variations

<table>
<thead>
<tr>
<th>Pool of Meanings</th>
<th>Categories of description</th>
<th>Variations</th>
<th>Codes used in the outcome space (shown in Appendix 3)</th>
</tr>
</thead>
</table>
| **5.2 Pool 1: Course** | Open learning as course organisation | • Causing initial disorientation  
• Aiding participation | C1.1 |
|                  | Open learning as an activity-based experience | • Limiting engagement  
• Fostering engagement | C1.2 |
|                  | Open learning as a facilitated experience | • Lacking direction and instruction  
• Directive and controlling  
• Facilitative and supportive | C1.3 |
|                  | Open learning as designed for collaboration | • Constraining  
• Enabling  
• Empowering | C1.4 |
| **5.3 Pool 2: Boundary crossing** | Cross-boundary learning through modes of participation | • As a valued informal learning experience  
• As a valued mixed mode learning experience  
• As a valued opportunity for recognition | C2.1 |
|                  | Cross-boundary learning through time, places and space | • As a disconnected experience  
• As a continuum | C2.2 |
|                  | Cross-boundary learning through culture and language | • As a barrier  
• As an enrichment | C2.3 |
|                  | Cross-boundary learning through diverse professional contexts | • As initial discomfort  
• As a catalyst | C2.4 |
| **5.4 Pool 3: Collaboration** | Collaboration as engagement in learning | • Selective  
• Immersive | C3.1 |
|                  | Collaboration as a means to shared product creation | • Product-process tension  
• Fulfilling | C3.2 |
|                  | Collaboration as relationship building | • Questioning the behaviour of others  
• Valuing the presence of others | C3.3 |
Appendix 3: The outcome space, final output of the phenomenographic study
Findings from a Case Study on Refugees Using MOOCs to (Re)enter Higher Education

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Abstract
This paper presents a case study evaluating the online learning experience of ten refugees on MOOCs. Qualitative data were collected from the learners, generating a set of 43 statements depicting the learners’ experience of learning, which were analysed using an augmented Community of Inquiry (CoI) theoretical framework. The key findings show that learners particularly desired teaching presence in terms of facilitation and feedback on their progress; they viewed online social presence as being important but generally not well managed in MOOCs; and they expressed cognitive presence mainly in terms of the selection and use of information sources. Learning presence (the additional element of the “augmented” CoI framework) was described primarily in terms of the importance of goal-setting and planning. The implications for organisations supporting refugees and other learners in disadvantaged circumstances on MOOCs are discussed.

Key Words: MOOCs, refugees, Community of Inquiry, developmental evaluation, Kiron

Introduction
This paper examines the learning experience of refugees and asylum seekers (who are included in the term “refugees” in this paper for brevity) within the context of a German non-governmental organisation, Kiron Open Higher Education gGmbH, which supports refugees to learn from massive, open, online courses (MOOCs). Kiron has designed learning pathways for refugees, with MOOC curriculum outcomes mapped onto typical learning outcomes of German higher education institution programmes. The aim is for those refugees who obtain credits from MOOCs to have those credits recognised by higher education institutions as being equivalent to their first semester of study, allowing Kiron learners to go straight into the second year of their degree programmes—assuming they also meet other entry requirements specified by the respective institutions (Suter & Rampelt, 2017). In addition to an online learning platform through which learners are directed to MOOCs in their subject of choice, Kiron offers support through the provision of volunteer study buddies and mentors, online tutorials, online study groups, and occasional face-to-face “study weekends”. The aim of this study was to help Kiron, and other organisations that support refugees and other MOOC learners in disadvantaged circumstances, to develop systems and strategies for effective learner support.

Context of the Study
Kiron is a social change organisation that acts as an intermediary between refugees and higher education institutions in Germany. The ecosystem within which Kiron operates is complex in at least three ways. Firstly, their recommended MOOCs are drawn from institutions around the globe, and these institutions are themselves bound by contracts with platforms such as Coursera and edX. Secondly, the availability of local volunteer tutors, buddies and mentors that Kiron can draw on to support
learners varies considerably according to region and discipline. Thirdly, the German universities that will ultimately accept Kiron learners operate within different regional and institutional policies. For these reasons, a developmental evaluation (Scriven, 1996; Saunders, Charlier & Bonamy, 2005) was chosen, as opposed to a formative or summative evaluation focusing on measuring outcomes or impact. One of the key characteristics of developmental evaluation is “double-loop learning (learning how to learn about the nature of the problem and situation)” (Patton 2015, p. 302). In this study, the “object” of the evaluation comprised the learners’ experience of those elements provided by Kiron, such as carefully curated and sequenced MOOCs, volunteers, and recommended free digital resources (e.g. language learning apps), as well as other MOOCs, resources (such as YouTube videos) and supporters external to Kiron.

Literature Review

Refugees and MOOCs

While some commentators have noted that MOOCs are generally most suited to relatively privileged learners living in well-resourced environments (Carlsen, Holmberg, Neghina, & Owusu-Boampong, 2016; Nti, 2015; Rambe & Moeti, 2017; van de Oudeweetering & Agirdag, 2018), the potential for MOOCs as a learning tool for refugees has been noted (Aydin, 2017; Bossu & Stagg, 2018). There is an emerging body of literature on migrants and open, online higher education. For example, the MOOCS4inclusion project report indicates that there is “a plethora of new FDL (free digital learning) initiatives for migrants and refugees that vary in nature, design and purpose” (Colucci et al., 2017, p. 99), and notes that the cases where MOOCs were found to be most effective tended to be “targeted, blended and facilitated” (Colucci, Muñoz & Devaux, 2017, p. 101). Moser-Mercer (2014), in her description of how she supported two refugees using a MOOC in the Dadaab refugee camp in Kenya, noted, not surprisingly, that there were significant technological obstacles for the learners. She also found that her role as a remote mentor to the learners was crucial; she had registered on the course as a learner herself, and attempted to anticipate challenges of a cultural, linguistic or technological nature that might arise for the learners so that she could intervene and support them in good time. She communicated regularly with the learners via email throughout the MOOC, and the learners noted her regular “presence” as an essential element in their motivation to complete the course (Moser-Mercer, 2014). Crea’s (2015) report on a four-year higher education pilot in refugee camps in Africa, which included the use of MOOCs, emphasises the need for cultural and linguistic translation of resources for learners in (and from) developing countries. The same point is confirmed elsewhere in the literature (e.g. Nkuyubwatsi, 2014; Moser-Mercer, Hayba & Goldsmith, 2016; Bozkurt, Yazici & Aydin, 2018).

Community of Inquiry Framework

The Community of Inquiry (CoI) framework for online learning was developed by Garrison, Anderson and Archer (1999). It comprises three interdependent dimensions in a process model for learning and teaching in a community: teaching presence, social presence and cognitive presence. These dimensions reflect the distributed teaching and learning responsibilities of all participants, with no strict role boundary between learners and teachers. A quantitative CoI survey instrument was published in 2008, using the three overarching presences and subcategories derived from the authors’ earlier publications: teaching presence was divided into design and organisation,
facilitation, and direct instruction; social presence was comprised of interpersonal relationships, open communication and group cohesion; and cognitive presence was divided into four phases – triggering event, exploration, integration and resolution (Arbaugh et al., 2008; Garrison, 2017). These categories were further described in terms of 34 indicators. This instrument intensified the use of the CoI framework in the literature.

In a study which examined publications from 2009-2013 in seven leading online and distance learning journals, the CoI framework was found to be the most frequently used theoretical perspective (Bozkurt et al., 2015). In other studies, the framework has been shown to predict students’ perceived learning and their satisfaction in online learning (Akyol & Garrison, 2008), and to predict learning outcomes (Garrison, Cleveland-Innes & Fung, 2010). It has also been used to compare students at different types of higher education institution (Moreira, Ferreira & Almeida, 2013), and as a heuristic for learning design (e.g., Dolan, Kain, Reilly & Bansal, 2017; Amemado & Manca, 2017). While the framework was originally designed for use in the context of asynchronous online learning, it has also been found useful for analysis of synchronous video communication in education (Themelis, 2014). The CoI categories have been found to align closely with recommendations for online teaching in professional education (Dunlap & Lowenthal, 2018), and the framework has been proposed as a model for conceptualising professional training for people in developing countries (Murugesan, Nobes & Wild, 2017). Two recent, large-scale studies have focused on the use of the CoI framework in MOOCs: Cohen and Holstein (2018) showed that MOOC learners attributed the success of certain MOOCs to a combination of all three presences; Kovanović et al. (2018) confirmed the validity and reliability of the CoI survey instrument for measuring perceived levels of teaching, social and cognitive presence within MOOCs, but suggested adjustments to the subcategories within the three presences to better account for specific learner perceptions arising out the differences between MOOCs and formal distance programmes – particularly in relation to the large size of learner cohorts and the relatively short duration of courses.

Critiques of the CoI framework have primarily pointed to the lack of its explanatory power for learners’ self-regulation (Broadbent & Poon, 2015; Kuo, Walker, Schroder & Belland, 2014; Shea et al., 2010; Shen, Cho, Tsai & Marra, 2013). Cho, Kim & Choi (2017) found that highly self-regulated learners were more likely to perceive higher teaching, cognitive and social presences than learners with low levels of self-regulation. Shea et al. (2010) and Shea et al. (2012) proposed a fourth presence, “learning presence”, to account for self-regulation, drawing on work by Bandura (1986) and Zimmermann (1999). Shea et al. (2012) identified the following subdivisions for Learning Presence: forethought and planning, monitoring, and strategy use. In keeping with Arbaugh et al.’s (2008) CoI measurement instrument, each subdivision had three to six descriptive indicators. In this paper I refer to the combination of the original three presences and learning presence, with their respective indicators, as the “augmented CoI framework” (See Figure 1). There is emerging research validating this concept (e.g. Pool, Reitsma & van den Berg, 2017). In response, Garrison (2017, p. 31) has warned that a fourth category would complicate the framework, compromising its explanatory power unnecessarily. Instead, he suggests using a “shared metacognition construct” as a way of addressing the identified “gaps” in the CoI framework (Garrison & Akyol, 2015); however, this construct is not yet well developed. A different critique is offered by Jaffer, Govender and Brown (2017), who found in their study of “wrapped MOOCs” in South Africa that questions of structure and agency (Giddens, 1986) could not be accounted for within the CoI theoretical framework. This issue is likely to be of particular relevance in the case of a marginalised group such as refugees.
The study

Ethical Considerations

As this paper was written as part of a PhD programme, I gained the requisite permission to conduct this research from Lancaster University. I obtained voluntary, informed consent from the participants, using a consent form approved by Kiron staff. For data protection purposes, the research participants were pseudonymised. Following Clark-Kazak (2017, p. 13), I avoided asking research participants for details about their forced migration experience that may have been re-traumatising. Participants were invited to check the transcripts, emphasising their role as research partners rather than “subjects”. The design of the study as a developmental evaluation was aimed at bringing about reciprocal benefits for the communities of participating refugees (Mackenzie, McDowell & Pittaway, 2007). As a further ethical consideration, I am sharing the research process and findings openly, in order to increase opportunities for peer feedback and to improve the visibility of findings (Pitt, de los Arcos, Farrow & Weller, 2016, p.36). To this end, I have published much of the raw data at a website created for this purpose (https://sites.google.com/artofelearning.org/qoolref).

Research Questions:

The study was guided by four research questions (RQs):

- RQ1: What are the learners’ depictions of how they learn online?
- RQ2: How do these depictions map onto the indicators for teaching presence, social presence and cognitive presence in the CoI framework (Garrison, 2017, p.173-175) and Shea et al.’s (2014) proposed indicators for learning presence?
- RQ3: What can we learn about the application of the enhanced CoI framework to the evaluation of the learning experience of refugees, and potentially also other learners in disadvantaged circumstances?
- RQ4: What are the implications of the findings for organisations supporting refugees, and potentially other learners in disadvantaged circumstances, to learn from MOOCs?
Methodology

The research design was planned using the RUFDATA framework (Saunders, 2000), which I shared in a blog post (Witthaus, 2017). This was a qualitative study, in keeping with the “emerging” and complex nature of a developmental evaluation. I was not commissioned by Kiron to do this study, but carried it out as a volunteer, framing my role as a critical friend rather than as a “neutral”, “external” evaluator. I had initial discussions with four members of Kiron staff to help me establish the research aims, and to determine the likely uses of the evaluation findings. The intention, from Kiron’s point of view, was to find out what aspects of their provision were working well, and whether there were aspects of the support they provided that would benefit from a different approach. It was agreed that I would ask the research participants the following questions:

1. What helped you to succeed in learning online?
2. How do you know whether you succeeded or not?
3. What kinds of challenges did you face, and how did you overcome them?
4. What else would have helped you succeed?

The data gathering process began at an on-site “study weekend” in Berlin, in August 2017, where I ran two focus groups with 13 learners. I asked them to write short statements in response to questions 1, 3 and 4 above, which we then discussed. Later, having obtained the learners’ consent, I emailed them all to request an online interview. I also invited my two Kiron “study buddies” to participate. In the email, I repeated the same three questions from the focus groups, and added question 2. Altogether, 11 learners responded. We carried out the interviews in September and October 2017. Unfortunately, one interview was cut short due to connectivity problems, leaving ten complete interviews. Two of the interviews took place mainly in German, and the rest in English with varying amounts of code-switching between the two languages. I therefore used “denaturalised” transcription (Oliver, Serovich & Mason, 2005), focusing on meaning rather than an exact replication of what was said. Personal data were recorded separately and aggregated anonymously to provide a demographic profile of the participants.

After asking the learners to review and edit the transcripts, I imported the transcripts into NVivo, where I carried out a first round of inductive categorical analysis, using open coding (Elo & Kyngäs, 2008). This phase generated codes mainly related to activities and resources that the research participants perceived to be either helpful or not for their learning, and their feelings about online learning. This was followed by a second round of coding involving a deductive categorical analysis, using the CoI survey instrument (Garrison, 2017, p.173-175) to code for teaching presence, social presence and cognitive presence, and the learning presence indicators from Shea et al. (2014, pp. 15-16). In the third round of coding, I reviewed every coded segment and developed a total of 43 statements or “depictions”, following Saunders, Charlier & Bonamy (2005, p. 42), of what learners said had helped or hindered their learning, and what additional support they would like.

Learner Profiles

Five of the ten participants came from Syria, two from Afghanistan, two from Pakistan and one from Uganda. Their ages ranged from 22 to 42, with five in their 20s and four in their 30s. Eight were studying business subjects, and two computer science. At the time of interviewing, three had been accepted into German universities; five were working towards applying in 2018; one was not planning to attend university, preferring to seek professional training opportunities; and one was undecided. Eight were male and two were female, which was an accurate, albeit unfortunate, reflection of the gender balance of Kiron’s learners at the time.
Results: Depictions of Learning

This section addresses the first two research questions:

**RQ1:** What are the learners’ depictions of how they learn online?

**RQ2:** How do these depictions map onto the indicators for the presences in the augmented CoI framework?

Research Questions 3 and 4 will be addressed in the discussion section.

Forty-three statements were generated about what had helped the learners learn, the nature of challenges experienced, and what further support they would like in relation to their online learning. The statements are presented in the tables below, organised around the revised CoI framework headings and subheadings taken from Garrison (2017, pp. 173-175) and Shea et al. (2014). The phrasing of each depiction is an agglomeration of the words used by the research participants, and includes my own paraphrasing, in line with the concept of denaturalised transcription. In those cases where a concept articulated by the participants matched one of the 34 indicators in Garrison’s (2017) survey, Garrison’s wording is used. (There were only four such instances.) Under each table, some of the key quotations from research participants relevant to that presence are presented, numbered according to the depictions they refer to in the table.

**Teaching Presence (TP)**

<table>
<thead>
<tr>
<th></th>
<th>It helped when...</th>
<th>I was challenged by...</th>
<th>I would like...</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TP1 Design &amp; organisation</strong></td>
<td>(1) the course system was well organised and easy to make sense of.</td>
<td>(4) the educational offer from Kiron, which I could not make sense of on my own.</td>
<td>(15) someone to help me stay on task.</td>
</tr>
<tr>
<td></td>
<td>(2) the course materials were designed to be engaging.</td>
<td>(5) the platform which was difficult to navigate.</td>
<td>(16) to be noticed, valued, and encouraged.</td>
</tr>
<tr>
<td></td>
<td>(3) the course materials were designed to be supportive.</td>
<td>(6) courses that were not suitable for my level.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(7) course content which was not related to real life.</td>
<td>(8) I was guided towards understanding course topics.</td>
<td></td>
</tr>
<tr>
<td><strong>TP2 Facilitation</strong></td>
<td>(9) I was kept “engaged and participating in productive dialogue” (Garrison, 2017, p. 173).</td>
<td>(10) I was challenged to work things out for myself.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(11) I was given support to stay focused on my learning.</td>
<td>(12) the “development of a sense of community among participants” (Garrison, 2017, p. 173) was reinforced.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(13) I was supported to reflect on my learning process in a structured way.</td>
<td>(14) the fast pace of delivery.</td>
<td></td>
</tr>
</tbody>
</table>

Findings from a Case Study on Refugees Using MOOCs to (Re)enter Higher Education

TP3 Direct instruction

<table>
<thead>
<tr>
<th>It helped when...</th>
<th>I was challenged by...</th>
<th>I would like...</th>
</tr>
</thead>
<tbody>
<tr>
<td>(17) I was given feedback on my strengths, weaknesses, and understanding of the subject matter.</td>
<td>(18) course content that contained open-ended questions with no feedback.</td>
<td></td>
</tr>
<tr>
<td>(19) course content that assumed prior knowledge that I did not have.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As can be seen from Table 1, teaching presence was alluded to in just under half (19) of the depictions. Several learners made comments about the ease or difficulty of making sense of both the Kiron and the MOOC providers’ platforms:

(1) With Kiron ... you have an exact, direct study track, you have organised courses, you can organise your materials, what you want to study, you can take it step by step... you can really plan your target, you know exactly what courses you have to do, what the next step will be when you finish with this course... (Salim)

(4) When I got into Kiron, first of all I didn’t understand anything. The level of complexity was too high for a newcomer, to know how to use the software and how to get into it. It’s about six, seven, eight hours long the process. (Imran)

The novelty of online education was a significant barrier for some learners – although it should be noted that Imran’s comment was typical of learners who had joined Kiron before October 2016, when the platform navigation was improved. Engaging materials were described as those containing animations, cartoons, music and humour. Supportive materials typically included videos with subtitles and supplementary notes.

Many comments were made about the ways in which learners felt guided towards an understanding of subject matter. The role of “facilitator” was distributed between tutors, peers, mentors and friends, and facilitation took place in various ways:

(8) [Interviewer: So this guy in Thailand, is he mentoring you online?] Online. Just asking questions about what I’m doing, and wants to make sure that I’m doing well. He’s very old-fashioned... He never gives me the answers, he just gives me some signs. He wants me to find out the hard way, even if it takes a month or a year. (Omar)

(9) In EBWL we had live tutorials... It was a Hangout. There was a lecturer from Uni Aachen... The tutor displayed and explained a presentation... We also participated, said our ideas. There was interaction. (Ibrahim)

Some learners expressed a wish for greater direction, and a desire to be noticed and encouraged:

(16) If someone was available and said: “OK we have these courses. Per week, this is how many hours each lesson should take.” I don’t want restrictions, but I want to say a little bit of restriction is useful here... For example, I did not do anything for a year, and ((laughs)) nobody asked me if you were there, or what are you doing? I’m grateful to Kiron, but I still wasted time. (Nj)

Several examples were given of how learners had sought, received and benefited from feedback – from other learners, from quiz or test results, from employers, from friends and from mentors.
Learners often expressed frustration about the gaps in their knowledge:

(19) Sometimes we face new knowledge, which we didn’t get at the university or in life. ... I wonder what that means, and so I have to look online or on YouTube or Google ... just to find the definition of this knowledge. It takes some time to get the answer. Sometimes the answer is not within my knowledge of how I can understand this communication, and that’s a problem. (Mo)

**Social Presence (SP)**

Table 2: Social Presence (SP)

<table>
<thead>
<tr>
<th></th>
<th>It helped when...</th>
<th>I was challenged by...</th>
<th>I would like...</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SP1 Interpersonal relationships</strong></td>
<td>(20) I got to know other learners and felt a sense of belonging.</td>
<td>(21) not knowing who I was communicating with online.</td>
<td>(22) to connect with other learners in my local area.</td>
</tr>
<tr>
<td><strong>SP2 Open communication</strong></td>
<td>(23) I networked widely with people in my subject area.</td>
<td>(24) my lack of self-confidence to communicate with others online.</td>
<td></td>
</tr>
<tr>
<td><strong>SP3 Group cohesion</strong></td>
<td>(25) we learned collaboratively online.</td>
<td>(26) the lack of cohesion in online discussions.</td>
<td></td>
</tr>
</tbody>
</table>

Table 2 shows that seven of the depictions related to social presence, with learners focusing mainly on the value of face-to-face interaction and the difficulties of sustaining meaningful interaction with others online. The face-to-face study weekend was mentioned frequently, always in positive terms:

(20) It was nice and I don’t feel that I’m alone at least. You get to know people and you see this is this person, this is that person who commented about something online... (Jasmine)

Online communication was usually depicted as problematic:

(21) There is a tutorial on Hangout I attended... It was good, but I can say it would be better if it was... something constant, not just to say oh hello, how are you. We don’t know each other’s names because our emails are just letters and numbers. (Mo)

However, some positive experiences with online communication were reported:

(25) The other students also ask questions in different ways (in the online tutorials), and I think it makes our mind a little bit bright to understand the topic. (Qadir)

There were several requests for Kiron to facilitate local networking opportunities:

(22) How could I study with other students? I’m so active and motivated when I’m studying with other students. It’s a good solution if they connect us. (Fatimah)
**Cognitive Presence (CP)**

Table 3: Cognitive Presence (CP)

<table>
<thead>
<tr>
<th>CP1 Triggering event</th>
<th>It helped when...</th>
<th>I was challenged by...</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(27) the presentation of course content grabbed my attention.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CP2 Exploration</th>
<th>I used “a variety of information sources to explore problems” (Garrison, 2017, p. 174)</th>
<th>(29) the lack of focused and timely learning activity in the discussion forums and online study groups.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP3 Integration</td>
<td>(30) I talked to other people about what I was learning. (31) I spent time revising the basics in the subject I was studying.</td>
<td></td>
</tr>
<tr>
<td>CP4 Resolution</td>
<td>(32) I was able to “apply new knowledge to my work or other non-class activities” (Garrison, 2017, p. 175)</td>
<td></td>
</tr>
</tbody>
</table>

From Table 3 it can be seen that the learners emphasised the use they had made of different information sources to help them understand course content. The following quote was typical:

(28) I remember the (MOOC) professor giving an example of a company and then I stopped the video right away and looked up the company because I was just interested. Or he uses a term... and I would stop the video and look it up... And when he says a whole point and I could go back and replay it, that was very helpful. (Ayoubi)

**Learning Presence (LP)**

Table 4: Learning Presence (LP)

<table>
<thead>
<tr>
<th>LP1 Forethought and planning</th>
<th>It helped when...</th>
<th>I was challenged by...</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(33) I set goals for myself. (34) I planned how I was going to use my time for learning.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LP2 Monitoring</th>
<th>I observed my progress. (36) I was aware of the different learning strategies that I was using.</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>LP3 Strategy use</th>
<th>(37) I had strategies for managing my time. (38) I put effort into learning. (39) I taught others. (40) I researched how other people became successful in my discipline and modelled my behaviour after them.</th>
<th>(41) the realities of daily life that distracted me from my learning. (42) the fact that I learn slowly on my own.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>LP4 Reflection</th>
<th>(43) I looked for learning opportunities in all situations.</th>
<th></th>
</tr>
</thead>
</table>
As indicated by Table 4, in terms of learning presence, examples of goal setting and planning abounded in the interviews, e.g.:

(34) I always take lectures and do the reading (on my smartphone) on my way to the office, and the test I always do at night (on my laptop) - it takes one or two hours... In short it is also not easy to complete these courses online without planning... I have also cut my time from watching TV and now spend it on my studies... The routine is necessary to achieve these goals. (Qadir)

Time management was also a significant preoccupation:

(37) The main problem is with time actually... there is no obligation. You had to do it by yourself... I always remind myself of my target, I have to do this and this, so motivation makes self-discipline. (Salim)

Finally, in relation to reflection, some learners were extremely resourceful in finding role models, mentors and opportunities to learn outside of their courses. Examples included learning from job interviews gone wrong or failed startup attempts, striking up conversations with strangers in a library, sending emails to experts identified through an online search, and volunteering at local community events in order to meet potential study mentors.

Discussion

I now return to RQ3: What can we learn about the application of the enhanced CoI framework to the evaluation of the learning experience of refugees (and potentially also other learners in disadvantaged circumstances)?

In the data analysis, the key dimensions of the augmented CoI framework (teaching presence, social presence and cognitive presence) proved useful, as did the subcategories (the labelled sections of the pie in Figure 1), which provided a structure for organising the 43 depictions. However, as noted, of Garrison’s (2017) 34 detailed survey indicators, only four mapped onto the depictions. It is worth noting that Shea et al.’s (2012) learning presence accounted for a full quarter of the statements generated. As an overarching framework, therefore, the main headings and subheadings of the augmented CoI framework enabled a coherent description of the learners’ experience. However, as predicted, some issues were not adequately addressed by the CoI framework. Most importantly, several learners referred to problems that social theorists refer to as “structural” (Giddens, 1986), such as how the distractions of life as a refugee, being separated from one’s family, and feeling uncertain about the future, made it difficult to focus on their studies. These issues manifest as personal problems, and yet this masks power relations within society. As one research participant put it:

As long as you’re getting the support, your family is taking care of you, you can put all your efforts in one direction and you can achieve it... For example, the last... ten days what I’ve been through has been horrific. I didn’t have the support when I was ill. There are lots of things that go through your mind, how am I going to manage that... Sometimes you feel a little bit disappointed because nobody is going to listen to this excuse... - they will see it on the paper that this guy has done this, but this guy couldn’t. (Imran)

The lack of explanatory power within the CoI framework to address such issues reduces its usefulness - echoing Jaffer, Govender and Brown (2017) in this regard. Other aspects that are insufficiently addressed in the CoI framework include factors related to culture and online learning (Bozkurt, Yazici & Aydin, 2018), and how learners’ perceptions of agency (Archer, 2007) affect their decision-making around learning. These would all be viable avenues for future research.

Finally, I consider **RQ4**: What are the implications of the findings for organisations supporting refugees, and potentially other learners in disadvantaged circumstances, to learn from MOOCs?

In terms of teaching presence, the design of both the overall educational offer and individual courses played a role in learners’ motivation to participate. Materials that were designed to be supportive (e.g. videos with subtitles and accompanying notes) were central to the learners’ sense of progress. The ways in which learners were guided towards understanding of key concepts, and received feedback on their strengths, weaknesses and understanding, was a major theme in the interviews. Responsibility for these functions was distributed widely between the MOOC lecturers (who appeared only in videos); Kiron’s volunteer tutors, mentors and buddies, competition judges, scholarship awarders, employment recruiters, and the learners’ friends, peers and mentors of their own choosing. Automated feedback on quizzes was also appreciated. The prevalence of these varied sources of guidance and feedback in the learners’ narratives points to the centrality of the facilitation role.

In terms of social presence, opportunities for face-to-face interaction were coveted. Participation in public MOOC “meet-ups” in learners’ local areas, using a facility such as Meetup.com, might address this perceived lack for some learners. Regarding online social presence, learners were reluctant to invest time and effort into discussion forums and learner-led online study groups, finding them generally lacking in focused and timely activity. Communication via these tools was also seen as impersonal. Clearly, social presence is not being sufficiently fostered in the MOOCs that these learners participated in.

In terms of cognitive presence, the research participants seemed particularly adept at finding and utilising resources to supplement the courses and fill gaps in their knowledge. However, the full cycle of “trigger, exploration, integration and resolution” was not articulated by any of the participants. This may be because the interview questions did not specifically elicit it, but it may also point to a lack of focus by MOOC designers on the most critical element of the learning experience.

As for learning presence, the learners had a rich array of individual strategies to draw on in enabling them to regulate their learning through goal setting and planning, and they discussed these at some length in the interviews. This suggests that a knowledge exchange between learners on learning strategies (perhaps even in the form of a MOOC) would be helpful for many learners.

**Conclusion**

The main limitation of this study relates to the sample size of ten research participants. A sample size of 12 has been demonstrated to lead to data “saturation” (Guest, Bunce & Johnson, 2006) in categorical analysis, although in the context of this case study, a much larger sample size may be called for, considering the diversity within the refugee community, and the myriad of factors that could affect learning from MOOCs. A second limitation was that I carried out the investigation alone, which was a necessary condition of this as an output of my PhD, and whilst I tried to be meticulous in my categorising, there was no interrater scoring process to confirm reliability of findings. Despite these limitations, the study demonstrates that the Community of Inquiry framework, augmented with the construct of Learning Presence, is useful as a partial model for analysing the learning experience of learners in disadvantaged circumstances on MOOCs, although it does not account for the impact that structure and agency have on the learning process. In conclusion, the Kiron learners’ depictions of online learning presented here should dispel the myth that MOOCs are only suitable for privileged learners with substantial experience of higher education, while also offering insights for organisations that want to widen participation in higher education through MOOCs.
Acknowledgements

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References


Findings from a Case Study on Refugees Using MOOCs to (Re)enter Higher Education


Findings from a Case Study on Refugees Using MOOCs to (Re)enter Higher Education


Scoping the nascent: An analysis of K-12 OER research 2012-2017

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Abstract
Awareness and use of Open Educational Resources (OER) has grown at all levels of education. Higher education researchers actively study OER but K-12 OER research indicates limited published results. To address this gap, this study examined articles meeting defined criteria and analyzed the results. Findings include cohesion of author-supplied keywords and ten primary categories of focus. From 38 articles studied, a variety of research methods were represented. Analysis showed Professional and Applied Sciences were overwhelmingly represented with the majority of articles within the discipline of Education and its fields with Humanities a distant second category of publication. The equal distribution between open and closed access journals may reflect changes to past scholarly publication practices. Citation analysis revealed divergences and reinforces the nascent quality of this topic. Future K-12 OER research that studies the complex change from resource scarcity to resource flexibility and digital abundance is needed.

Keywords: K-12, OER, open education, open educational practice, open pedagogy, literature analysis

Introduction
Since UNESCO's early open courseware forum in 2002, public domain or open licensed educational materials - referred to as Open Educational Resources (OER) - have increased in three significant ways: awareness of these malleable educational resources; the use of OER through the development of a variety of public repositories; and, the concomitant support for OER by an array of advocates. Educators’ practices, informed by the educational publishing legacy who traditionally contributed to and shaped content and curriculum at all levels of education, has amongst some circles begun to embrace the pedagogical changes wrought by an open web and participatory technologies. As Merkley (2018) notes, there has generally been a rapid rise in the use of open licenses, suggesting approximately 1.4 billion licenses had been issued by 2017.

The understanding and awareness of OER continues to evolve. UNESCO (2012) defined OER as including a wide range of learning materials, from “textbooks to curricula, syllabi, lecture notes, assignments, tests, projects, audio, video and animation (UNESCO, 2012, para 1).” Wiley (2014) later suggested ‘the 5Rs’ of OER. The 5Rs function to i) retain an open license that permits ii) reusing, iii) revising, iv) remixing, and v) resharing. To further enhance the definition of OER and its growth toward Open Educational Practice (OEP), Cronin (2017) suggests that OEP involves “collaborative practices that include the creation, use, and reuse of OER, as well as pedagogical practices employing participatory technologies and social networks for interaction, peer-learning, knowledge creation, and empowerment of learners” (p. 18). The combining of these changes has
helped engender a pedagogical reframing through the eight attributes of open pedagogy (Hegarty, 2015), with less reliance on the legacy practices of educational publishing at all levels of education. Within higher education, the awareness, use, and support for OER has been widely discussed with a focus on specific topics such as quality assurance (Atenas & Havemann, 2013) or within broader domains including open scholarship (Pearce, Weller, Scanlon & Kingsley, 2012; Veletsianos & Kimmons, 2012), and open pedagogy (Hegarty, 2015). In part due to a search for solutions to the high cost of higher education textbooks, there has been a slow increase in the use of user-generated content and open textbooks in higher education classrooms (Janghiani & Janghiani, 2017). Synthesizing studies of efficacy and perceptions of use have affirmed that at higher education, students achieve comparable learning outcomes with OER, with both students and instructors having positive perceptions of using OER (Hilton, 2016).

But what about K-12 environments? Because of the unique nature of the K-12 educational system and its prominent role within all countries, this study seeks to examine recent research in K-12 OER from the years 2012-2017.

In this paper we have used a set of researching decisions to determine a broad yet rigorous catchment of K-12 OER scholarly articles published from the years 2012-2017. From these results, we have sought to answer two questions: What are the predominate areas of focus in published K-12 OER research? And, secondly, what research methods do scholars apply when investigating K-12 OER topics? The research methods used are those identified by West and Borup (2014) who examined a decade of research to identify trends within instructional design and technology scholarship. Because OER involves participatory technologies, these established classifications were applied for the purposes of this paper.

Unlike traditional academic scholarship, the intended benefactors of this overview of K-12 OER research casts a broader net. There is increased expectation for practitioners inclusive of classroom teachers, school principals and senior school authority leaders to “stay current with educational technology research; participate in and apply research to learning and teaching” (Alberta Education, 2013, p. 3). Additionally, with the growth of open scholarship, access to openly licensed educational research has the potential to contribute to aspects of citizen science (Silvertown, 2009 as cited by Anderson, 2013), to support undergraduate and graduate students, and to enhance scholarly access throughout the world (Anderson, 2013). Concomitantly, the movement toward evidence-based decision-making has been buoyed through annual professional dues such as the Alberta Teachers Association (ATA) financing digital library access of subscription-based research journals (ATA, 2018). Such systemic library support for classroom-based teachers is likely rare but with the rise of Open Access journals, educators without access to subscription-based journals may still be able to read and consider pedagogical implications of current educational research. These developments point to a greater movement toward reading, applying, and creating research as part of K-12 school culture that has thus broadened the readership of educational research. Thus, this paper supports the teaching profession and the ongoing cultural change that may further research findings and discussions by a professional yet previously underserved audience. Additionally, as OER is part of the broader Open movement (Cronin, 2017), open scholarship also aligns with expanding research dissemination known as Knowledge Mobilization (KM) strategies extending the distribution of research beyond the conventional audience (Social Science and Humanities Research Council of Canada [SSHRC], 2018) through pursuits such as open data and open practices. In short, interest in K-12 OER research may increase not only because of topic growth but also because of increased practitioner readership through KM dissemination activities and Open Access journals.
It is only within recent years that stakeholders have begun to nurture K-12 OER awareness. In part, this awareness catalyzed in 2015 with the United States Department of Education’s (USDE) successful #GoOpen initiative. Similar to the use of OER within higher education, the USDE identifies a monetary rationale for reassigning funds away from traditional textbooks to supporting digital learning through OER (USDE, 2018a, para 9). However, as OER advocates often state, the financial benefits come with pedagogical advantages as well (Blomgren, 2017; Wiley, Hilton, Ellington & Hall, 2012). The #GoOpen initiative encouraged a broader dialogue and dissemination of information on the policies and practices that impact teaching, learning, and collaboration. ... [and] documenting and sharing [of] new approaches to professional learning for teachers, and curating resources that offer... options for personalizing learning, and strategies to support curating, creating, adapting and sharing OER (USDE, 2018b, para 2-3).

Within the three years since the initiative, 20 American states have developed OER and these states may act as ambassadors to support districts embarking upon OER (USDE, 2018b, para 6). Prior to #GoOpen, K-12 OER had little prominence in the USA and this extends to Canada because of the complex political, historical, and geographic ties between the two countries. OER research significance for K-12, unlike within higher education, lays in potentiality but as this paper demonstrates, interest grows in this topic.

**Method**

**Scope and search**

We performed literary searches using the library search engines of two universities with graduate programs in education (Athabasca University and University of Ontario Institute of Technology) providing access to JSTOR (http://www.jstor.org), Project Muse (https://muse.jhu.edu), ProQuest (http://www.proquest.com) and ERIC (https://eric.ed.gov) databases. To replicate the experience of K-12 practitioners who have limited or no access to post-secondary databases, we performed a third search using the publicly available Google Scholar (https://scholar.google.ca).

The materials analyzed are limited to 2012 and later. This study’s authors perceived 2012 as a suitable start date for the research analysis. Searches for the terms “K-12” paired with “Open Education Resources” or “OER” returned few results prior to 2012, thus, suggesting K-12 OER seemed to have had little prominence in the USA or Canada and that there were limited materials that might contribute to an analysis of research trends. Grey literature was not included although we later discuss its role in the changing face of OEP and the shifts experienced in KM with the scholarly use of open sharing platforms.

Initial searches focused exclusively on scholarly (peer reviewed) articles within the discipline of education. Due to the timelines for research / publication and the need to analyze the materials further, only full-text articles were selected for each search. In an effort to ensure that we had not missed relevant materials, the top 100 results from each inquiry were sorted by relevance and cross-referenced. Items after the top 100 items appeared to yield no relevant results.

We applied the following search terms with relevant Boolean operators: *Open Educational Resources, OER, K-12, and PreK-12*. Subject delimiters included all of “open educational resource,” “education,” “oer,” “k-12,” “open textbooks.” Because the principle investigators only speak English, we included the further delimiter of “only articles in ‘English’”. We saved results as searchable pdf
format documents, loaded into the reference software Mendeley and then exported to Nvivo software for detailed analysis.

Analysis and Results

A two-member research team used member checking to ensure consistency in coding decisions and a series of research notes were recorded and further guided descriptive coding decisions. The analysis included: word frequency searches of both full articles and author-supplied keywords; categories, topics, and subtopics including topical root keyword analysis and the degree of inclusion by source; classification of research methods; the discipline and field of publication output; journal type; and, lastly citation patterns. We decided to not include authorship, in part because of the nascent quality of K-12 OER with only 38 articles meeting the scoping criteria (list available in Appendix A).

To begin, an overview analysis included searches for word frequency and source attributes (e.g. journal articles by year and by title.) Word frequency searches included stemmed words (e.g. the result for educators’ includes: educ OR educate OR educated OR educating OR education OR educational OR educationally OR education’ OR educative OR educator OR educators OR educators’). Extraneous common words (Appendix B) were excluded.

As to be expected the most common results included educators, OERS, teachers, students, use, learns, and opens. However, frequency of use does not indicate alignment on how the term is being used. The word open provides such an example. Depending on the researcher, open education varies from an emphasis on empowering learners, to networked learning, participatory technologies, collaborative practices, and open educational practice (DeVries, 2018). Further analysis of the word cloud revealed other important results. Some third tier words only appeared in two articles (e.g. “schools”) while some of second tier terms (e.g. “students”) appeared in multiple articles. As might be expected, the overall frequency of a term did not, necessarily, suggest breadth of interest or degree of discussion. More rigorous analysis was then applied.

Ultimately, rather than rely upon a pre-determined set of categories, we decided to perform a second and third round of grounded coding (Saldaña, 2016). We extracted and performed a word frequency search on the author-supplied keywords that appeared more than once. Any that returned multiple results provided the basis for enhanced text searches of the full articles. To capture variations and/or related concepts, we used the Oxford English Dictionary and a thesaurus to derive a list of synonyms. Synonyms that were not applicable to the intended OER focus of the search were excluded. Three non-keyword terms (i.e. adoption, integration, and support) were also included in this level of coding as through the coding iterations they were observed to be integral to understanding OER research yet had not been identified as keywords, either by authors or journal editors. The articles meeting the criteria were coded, the coding reviewed, and unsuitable instances of coding removed. The results were then grouped into themes, topics, and sub-topics.

Table 1 provides the terms used, number of resources, and total number of references produced by this coding process. A comparative overview of the number of references by keyword is provided in Figure 1 and the number of sources in which the keywords are referenced in Figure 2.

Table 1 results show the catchment themes, topics, and sub-topics of keyword search results. At this level of coding, Khan Academy was noted to be overrepresented because three articles specifically focused on this non-profit web-based open learning resource that provides exercises, instructional videos, and a student dashboard for support in subjects such as high school mathematics. In the iterative coding steps that followed because of its specificity and lack of similarly narrow subtopics appearing, we decided to not further pursue Khan Academy in this level of coding. In combination with Figure 1 and 2, there appears to be a strong interest in the significance of teaching and learning,
Table 1: Categories & Topics / Sub-topics by Author-Supplied Keywords (Condensed).

<table>
<thead>
<tr>
<th>Themes</th>
<th>Topics</th>
<th>Subtopics</th>
<th>Files</th>
<th>References</th>
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</thead>
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<td></td>
<td>38</td>
<td>7,593</td>
</tr>
<tr>
<td>Material</td>
<td></td>
<td></td>
<td>38</td>
<td>3,320</td>
</tr>
<tr>
<td>Text</td>
<td></td>
<td></td>
<td>21</td>
<td>1,221</td>
</tr>
<tr>
<td>Development</td>
<td>Development</td>
<td></td>
<td>38</td>
<td>5,921</td>
</tr>
<tr>
<td>Growth</td>
<td></td>
<td></td>
<td>38</td>
<td>2,187</td>
</tr>
<tr>
<td>Model</td>
<td></td>
<td></td>
<td>38</td>
<td>1,663</td>
</tr>
<tr>
<td>Adoption &amp; Integration^^</td>
<td>Adoption ^^</td>
<td></td>
<td>38</td>
<td>2,334</td>
</tr>
<tr>
<td></td>
<td>Integrate</td>
<td></td>
<td>38</td>
<td>773</td>
</tr>
<tr>
<td></td>
<td>Support ^^</td>
<td></td>
<td>38</td>
<td>606</td>
</tr>
<tr>
<td>Quality</td>
<td>Quality</td>
<td></td>
<td>38</td>
<td>3,742</td>
</tr>
<tr>
<td>Defining Characteristics of OER</td>
<td></td>
<td></td>
<td>38</td>
<td>3095</td>
</tr>
<tr>
<td>4Rs; 5Rs</td>
<td></td>
<td></td>
<td>38</td>
<td>1,660</td>
</tr>
<tr>
<td>Share</td>
<td></td>
<td></td>
<td>38</td>
<td>1,435</td>
</tr>
<tr>
<td>Technology</td>
<td></td>
<td></td>
<td>38</td>
<td>2,784</td>
</tr>
<tr>
<td>Khan Academy</td>
<td>Khan Academy</td>
<td></td>
<td>12</td>
<td>1,021</td>
</tr>
<tr>
<td>Cost, Expense</td>
<td></td>
<td></td>
<td>37</td>
<td>910</td>
</tr>
</tbody>
</table>

Note: ^^ indicate non-keyword
and secondly administration. The next seven categories (access; resources; development; adoption and integration; quality; defining characteristics of OER; and technology) highlight a focus on the pragmatic nature of K-12 OER awareness and use. Classroom teachers and educational leaders perceive potential financial shifts with OER with cost being the least identified category generated by the coding processes. Figures 1 and 2 reflect the “how” of “doing OER” which relates to the following areas and concerns: the changes brought to teaching and learning (e.g. understanding and applying Creative Commons licenses and the 5Rs); administration (e.g. institutional processes to successfully incorporate OER); access (e.g. computer connectivity); resources (e.g. the relationships among copyright restricted practices, OER digital pedagogies, and instruction); development (e.g. administrative supports for teachers creating and sharing OER); adoption and integration (e.g. how to successfully apply the 5Rs); quality (e.g. assurances for high-quality open resources); defining characteristics of OER (e.g. defining OER practices and how they relate to the legacy publishing system); technology (e.g. the degree and manner in which digital technologies are woven into using OER); and lastly, cost/expense (e.g. examining the monetary expenditures that are required when moving to OER).

**Article Types & Research Methods**

From the qualifying articles, seven groupings were applied that represent “broad and easily identifiable paradigms of educational research and theoretical inquiry” (West & Borup, 2014, p. 547). As indicated in
Table 2: Article Types and Research Method

<table>
<thead>
<tr>
<th>Type</th>
<th># of Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theoretical &amp; Philosophical</td>
<td>10</td>
</tr>
<tr>
<td>Combined methods</td>
<td>8</td>
</tr>
<tr>
<td>Descriptive analysis</td>
<td>7</td>
</tr>
<tr>
<td>Inferential analysis</td>
<td>6</td>
</tr>
<tr>
<td>Interpretative analysis</td>
<td>3</td>
</tr>
<tr>
<td>Content &amp; discourse analysis</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
</tr>
</tbody>
</table>

Figure 3: Number of sources by research method

Table 2, these research methods revealed the following breakdown: 10 theoretical/philosophical articles; eight combined (mixed methods) analysis, seven descriptive analysis, six inferential analysis, three interpretative/qualitative; two content analysis and two ‘other’ types - an opinion piece and ‘how to’ article.

Although West and Borup (2014) had a much larger study based on analyzing a decade of ten journal publication patterns, a comparison reveals that for both their study and this one, theoretical/philosophical articles held the first spot. However, similarities end there and the combined methods, descriptive analysis, and inferential analysis account for half of the methods identified. Interpretative analysis which held the second spot (West & Borup, 2014) was in this study, the fifth most common K-12 OER research method, with content and discourse following next and lastly, “other,” which included practical expository discussion papers of classroom OER collaboration and an overview of the OER field targeted at librarians.

The emphasis on theory is not surprising in a nascent area such as K-12 OER. Theory speculation and development spawns new approaches and pedagogical models that reflect ongoing technological changes and their incumbent application including the societal implications of near ubiquitous mobile devices. Theories evolve, respond, and reflect how people are using and understanding digital technologies, so it is not surprising that numerous articles reflected this theoretical and philosophical orientation. Additionally, the variety and distribution of research methods (figure 3) suggest that from 2012-2017 there has been various research perspectives and approaches used to study K-12 OER. These results could be viewed as unsurprising but also confirmation that no one research perspective dominates which speaks to a healthy and varied research landscape.
Discipline, field and sub-fields

A fifth analysis involved discipline and field representation to investigate if any predominated. Because of the broad and varied nature of OER within K-12 and its links to discipline and areas such as computing, educational technology, learning sciences, curriculum, and pedagogy, the overview of articles included disciplinary and sub-disciplinary analysis of where the journals were being published, including if these journals were open access. The two main categories represented were Humanities but with only one article included. Within Professional and Applied Sciences, Library and Museum Studies also had one article and the Education discipline held the remaining 36. The fields within Education included: open education, distance education, educational technology, and science education. Because of the nature of education and its fields, movement between and among fields was noted and indicates cross-fertilization (Table 3).

Figure 4 excludes fourteen documents that met the scoping criteria (i.e. book sections and conference proceedings) and therefore illustrates article distribution published in non-open or open journals. The equal breakdown between non-open and open journal publication reflects the nature of academic habit and precedent. Because they are not behind a paywall, open access journals may attract users who may not have subscription-based access through a university library. Additionally, newer articles also attract more traffic and there is the disputed “open access citation advantage” (Piwowar et al., 2018, p. 5). Because of the nature of OER and its relationship to openness and the open movement, researchers investigating K-12 OER may be more inclined to support Open Access journals. This support represents a philosophical orientation and a strategic choice as the readership of open journals may reflect those interested in open scholarship. The equivalent choice

<table>
<thead>
<tr>
<th>Discipline</th>
<th># of Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humanities</td>
<td>1</td>
</tr>
<tr>
<td>The Arts (Literature)</td>
<td>1</td>
</tr>
<tr>
<td>Professional &amp; Applied Sciences</td>
<td>37</td>
</tr>
<tr>
<td>Education</td>
<td>36</td>
</tr>
<tr>
<td>Distance Education (includes Distributed Learning)</td>
<td>12</td>
</tr>
<tr>
<td>Educational Technology</td>
<td>4</td>
</tr>
<tr>
<td>Open Education</td>
<td>18</td>
</tr>
<tr>
<td>Science Education</td>
<td>2</td>
</tr>
<tr>
<td>Library &amp; Museum Studies</td>
<td>1</td>
</tr>
</tbody>
</table>

Figure 4: Number of Articles published in Open vs. Non-Open Journals

by K-12 OER researchers regarding closed or open access journal publication reflects a growing trend (Piwowar et al., 2018), a philosophical stance, and a considered understanding of changes to citation patterns.

**Citation analysis**

To analyze citation patterns, we used the Publish or Perish software (version 6.33.6259, Harzing, 2007), which uses Microsoft Academic Search and Google Scholar with its more inclusive search capacities (i.e. languages other than English, book chapters, books). This decision is similar to that of West and Borup (2014). Citation metrics are used for academic promotions and as a means to measure scholarly impact but they were designed for the Sciences and are less representative of the contributions to an area within the Social Sciences, Humanities, and Education. Using the software, a broad net was cast which this literature-scoping task required. Pertinent findings were highlighted, especially the substantial range difference in the number of Google Scholar citations and four citation groupings were established: high, moderate, minor and uncited. In the high category, only one article was included as it had received 134 citations. In the moderate category seven articles were cited 77-25 times. The minor category held twenty articles with citations ranging from 12-1. There were seven articles with no citations at the time of analysis (Figure 5).

**Discussion and Future Research**

This study highlights several key findings. Although higher education has been writing and researching OER for quite some time, even before the 2002 UNESCO Global Forum adoption of the term OER (UNESCO, 2002), this study reveals that K-12 OER activity substantially lags behind. With only 38 articles meeting the criteria, yet with K-12 OER potentially influencing vast numbers of educators, students, and public dollar investment, this significant research area will likely continue to grow.

The scoping of OER K-12 research provides a sense of the current landscape. Through initial analysis, we determined the writing cohesion of researchers explicating their results and through the processes of coding pertinent categories, topics, and sup-topics emerged. Overall, the topics generated indicate that procedural and pragmatic sub-topics have been initially studied, and with the demanding nature of K-12 teaching this procedural emphasis comes as no surprise. Having OER research explore what it means to teach students with public domain and openly licensed, accessible, and manipulative resources marks the transition to resourcing and teaching options that previously were unavailable in the legacy publishing system. The consistent appearance of these practical topics in all of the articles studied reinforces their inter-relationships and suggests that further and deeper research within each of these sub-topics (Figure 1) merit attention. This movement toward more
specificity is supported by the outlier Khan Academy articles and suggests how research pursuits may organically evolve and deepen over time. Similar to higher education OER research, the concern regarding quality echoes studies and reports previously identified by a number of scholars (Allen & Seaman, 2014; Atenas, Haveman & Priego, 2014; Camilleri, Ehlers & Pawlowski, 2014; Misra, 2013). For K-12, in part because of its unique parameters, definitions of quality require precision, such as the comparison of OER to copyright restricted textbooks providing a springboard to discern such criteria (Kimmons, 2015). In a similar vein, adopting the 5Rs requires unambiguous articulation of these processes to strengthen future research studies as “open education narratives and initiatives have evolved in different contexts, with differing priorities. …[and] open education often means subtly or substantively different things to different people” (Cronin, 2017, p.16). The varieties of research methods also suggest that despite the immaturity of the K-12 OER topic, researchers are not favouring one research approach over the many available. The equal break down of closed versus open journals submissions also suggest that there is a balanced approach when publication decisions arise. Why some authors choose to research OER but select a closed access journal in which to publish results would prove a worthwhile research topic and may reflect the complexities involved with OER publication decisions (Weller, Jordan, DeVries & Rolfe, 2018). Additionally, having inter-topic research answer questions regarding attitudes of OER awareness, use, and advocacy would further pedagogical and theoretical understanding of the changes that teaching and learning with K-12 OER involves.

The citation patterns indicated four divergences. The first occurred with the most frequently cited article that discussed OER quality being nearly twice in impact (i.e. 134 to 77 citations) to the second most cited article regarding cost savings. Within the moderate range of seven articles, four had a stronger level of citation (i.e. 77-47) and the remaining three somewhat less vigorous use (i.e. 39-25); the titles and keywords of the moderately cited articles covered cost, Khan Academy, textbooks, barriers to OER, general OER discussion, educator perceptions, and implementing OER at the high school level. The 26 articles that were cited in a minor way (12- 1) spread out in a long tail, with two thirds of these receiving five or less citations. Lastly, there were seven articles that had no citations but no obvious explanation emerged regarding this disbursement. These findings were surprising because within an emerging topic and its lack of scholarship, one would anticipate that citing published K-12 OER papers would provide a clustering of citations. However, the overall pattern indicates one strong leader, a small clustering of moderately cited papers and then a thinning of scholarly impact by the majority of papers included in this scoping exercise. Low citations are not necessarily indicative of impact and these patterns could dramatically change in a short amount of time.

We do note that the topic is a small part within the discipline of education and even within the field of distance education that historically spawned OER. Additionally, although OER forms part of current higher education librarian scholarship, only one article came from library studies. This can perhaps be explained with the decline of print materials and the rise of the digital, many school based library programs dissolved into learning commons and the role of school librarians weakened; however, with the rise of OER and its concomitant relationships to curation, review, and copyright, school librarians may experience another change in their role. Nevertheless, this void remains active as reflected by these scoping results.

Limitations of this study include only a five-year span and the results produced are admittedly small. However, due to the nascent element of K-12 OER and of openness education in general (Jordan & Weller, 2017; Peter & Deimann, 2013; Weller, Jordan, DeVries & Rolfe, 2018), a greater time period may not have substantially shifted the results. Additionally, keyword frequency count provides a useful starting place for scoping purposes but the depth and complexity of teaching with OER cannot be easily captured. Keywords provide an initial representation of the article and
aide search engine optimization, with suggestions to use keywords every 100-200 words (Eassom, 2017, para 3), something that authors are noting especially with Google Scholar becoming more prominent. Keyword analysis was useful for our study but as this area of research matures, other approaches would prove beneficial. It would be fruitful to complete more in-depth analysis of the sub-topics and inductively code them for thematic results. A final limitation is that this study did not include grey literature such as scholarly blogs or comprehensive reports, in part due to the difficulty in defining grey literature as well as the challenges in consistently locating these documents, even with the efficacies engendered by the internet (Mahood, Van Eerd & Irvin, 2014). However, with the growth of social software such as Twitter to announce and share information as part of a professional learning network, the sharing of grey literature and KM practices are being redefined in the digital age.

Future research will no doubt pursue more detailed analysis of the financial benefits and challenges of K-12 OER because of the inherent monetary implications associated with assembling and offering educational resources. K-12 education is a public pursuit and forms UNESCO’s fourth sustainable development goal. Effective education affordably delivered with high quality resources that reflect participatory and digital pedagogical practices align with research of systems based, broad or big OER whereas little OER (Weller, 2010) studies pursue smaller scale more individually founded, procedural, and pragmatically inclined explorations.

It is clear that significant changes are afoot. With the movement toward K-12 teachers accessing, reading, and applying evidence-based research - in tandem with the rise of open journals and the continuing ease of access and sharing of grey literature through professional learning networks and social media - these practices highlight professional change. The access, manner, and readership of taking up K-12 OER research and its concomitant results reflect broader knowledge mobilization transformations.

Broadly speaking, the pedagogical and educational resource practices of the previous century are changing because of pervasive, participatory technologies. This fundamental change from resource scarcity to resource flexibility and digital abundance contributes to leadership and administrative concerns, including issues related to copyright and publishing, and thus reinforces the need for thoughtful responses of how to support K-12 OER. Pragmatic professionals, at all levels, educators are looking for answers. Whether big or little OER, our study highlights the vast number of research possibilities still yet to come.

References


Anderson, T. (2013). Open access scholarly publications as OER. The International Review Of Research In Open And Distributed Learning, 14(2), 81-95. http://dx.doi.org/10.19173/irrodl.v14i2.1531


Appendix A: Materials Analyzed


**Appendix B: Word Frequency Stop List**

The following dates and terms were excluded from the initial Word Cloud key terms search.

- 2010 2011 2011a 2011b 2011c 2012 2012a 2012b 2013 2013a 2013b 2014 2015 a about above after against all am an and any are aren’t aren’t as at be because been before being below between both but by can can’t cannot could couldn’t couldn’t did didn’t didn’t do does doesn’t doesn’t doing don’t don’t down during each few for from further had hadn’t hadn’t has hasn’t
Scoping the nascent: An analysis of K-12 OER research 2012-2017

have haven’t haven’t having he he’d he’ll he’s he’d he’ll he’s her here here’s here’s hers herself him himself his how how’s how’s http i i’d i’ll i’m i’ve i’d i’ll i’m i’ve if in into is isn’t it it’s it’s its itself let’s let’s me more most mustn’t mustn’t my myself no nor not of off on once only or org other ought our ours ourselves out over own said same say says shall shan’t shan’t she she’d she’ll she’s she’d she’ll she’s should shouldn’t so some such than that that’s the their theirs them themselves then there there’s these they they’d they’ll they’re they’ve they’d they’ll they’re they’ve this those through to too under until up upon us using very was wasn’t we we’d we’ll we’re we’ve we’d we’ll we’ve were weren’t weren’t what what’s when when’s when’s where where’s where’s which while who who’s who’s whom whose why why’s why’s will with won’t wouldn’t wouldn’t wouldn’t www you you’d you’ll you’re you’ve you’d you’ll you’re you’ve your yours yourself yourselves

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‘Dark reuse’: an empirical study of teachers’ OER engagement

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Abstract

There is scant evidence of OER reuse or sharing; OER apologists maintain that reuse is happening in private spaces, but others argue there is no evidence of such ‘dark reuse’.

The OER lifecycle provides a model of OER engagement, defining five key practices: finding, composing, adapting, reusing and sharing. However, no empirical research has yet investigated whether teachers’ engagement with OER follows this model; evidence from OER repository analytics suggests not.

This paper draws on an empirical study of engagement with an OER repository by language teachers at a distance university (The Open University UK). Through the applied thematic analysis of data generated through observation of lesson preparations, the paper’s contribution is to validate the OER lifecycle model and provide evidence of ‘dark reuse’. Qualitative tools, sensitive to the situated nature of OER engagement, are crucial to understanding invisible practices around ‘dark reuse’, and sophisticated models that embrace the complexity of OER ecosystems are needed.

Keywords: OER; dark reuse; OER lifecycle; sharing; OER ecosystem; language teaching; higher education

Introduction

In the OER discourse, the promise of the OER movement is that the world’s knowledge is a public good, and that it can be harnessed and shared through technology so that everyone can use it and reuse it as they wish (Smith & Casserly, 2006). In the past fifteen years, considerable philanthropic funding has been devoted to creating a wealth of free educational resources and collections. However, it appears that the promise of OER has not been fully realised, and the anticipated adoption, reworking and sharing has had only limited success. There have been very few studies of ‘real world’ reuse of OER, and there have been questions about whether reuse is indeed occurring at all.

A key aspect of OER is that their open licences enable a particular set of practices to take place, which Wiley (2007, 2014) conceptualised as the 5 Rs:

- Reuse: use the work verbatim, just exactly as you found it
- Rework: alter or transform the work so that it better meets your needs
- Remix: combine the (verbatim or altered) work with other works to better meet your needs
- Redistribute: share the verbatim work, the reworked work, or the remixed work with others
- Retain: ‘the right to make, own, and control copies of the content’.

Gurell (2008) provided an early model of engagement with OER and defined five key practices, namely finding, composing, adapting, and, crucially, reusing and sharing OER. Building on Wiley (2007) and Hilton, Wiley, Stein, Johnson and Hilton III (2010), other authors (Pawlowski & Zimmermann, 2007; Glahn, Kalz, Gruber & Specht, 2010; Santally, 2011; Clements & Pawlowski, 2012) have outlined other version of the constituent elements of the OER cycle. What all the models have in common is that they assume that resources are found, adapted in some way and used, and

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then shared. However, there appears to be little evidence of OER reuse or sharing by individual users, and especially by educators. Indeed, to date no empirical research has investigated whether the practices of teachers as they engage with OER follow the lifecycle model, or whether, as the evidence from OER repository analytics suggests, they do not actually engage with OER, and especially with reuse and sharing.

In terms of the research agenda, over the years there have been calls for research into how best to foster teachers’ reuse of OER (Masterman & Wild, 2011)—an aspect that seems under-researched (Windle, Wharrad, McCormick, Laverty & Taylor, 2010)—, and how best to enable the infrastructure for sharing OER to appropriately support the needs of teachers (Davis et al., 2010). Petrides, Nguyen, Jimes and Kargliani (2008) argued that “we know little about users and what inspires reuse, and even less about what motivates OER creators to republish content that they have reused and augmented” (Petrides et al., 2008, p. 102), and it seems that this was still an issue six years later, when Hassler, Hennessy, Knight and Connolly (2014) reminded us that the little research into OER “has tended to focus on OER production and policy—particularly in HE—rather than the experiences, quality perceptions, learning, and educational practices of OER users and producers” (Hassler et al., 2014, p. 4). More recently Bradley and Vigmo (2016) have argued that to date, “there is little research concerning teachers’ pedagogical design of OER and the potential implications of pedagogical foundations for OER” (p. 284); similarly, in their overview of recent research on OER repositories, Santos-Hermosa, Ferran-Ferrer and Abadal (2017) conclude that none of the studies they reviewed specifically address the reuse and pedagogical aspects of OER repositories.

Wiley, Bliss and McEwen (2014) have highlighted a number of high level issues that remain unresolved and merit further investigation, namely the problems around discovery, sustainability, quality, localization and remix. Likewise, in their meta-analysis of existing case studies of OER implementation initiatives in higher education, Judith and Bull (2016) also identified a number of key challenges related to OER implementation. These include issues around the localization and contextualization of OER, identification of suitable OER (i.e. of sufficient quality), discoverability challenges, challenges related to use permissions, and what they term “knowledge-related challenges” (Judith & Bull, 2016, p. 6).

Why, then, is it important to understand whether teachers engage in the practices outlined in the OER lifecycle? As Ehlers (2011) argues, “OER usage, re-usage, sharing and creation are not an end in itself”, but engaging with them has to result in better teaching practices and learning experiences (Ehlers, 2011, p. 7), a view that is at the heart of open educational practices.

In their seminal edited book, Opening Up Education, Iiyoshi and Kumar (2008) suggested that OER have the potential to “iteratively and continuously [improve] the quality of teaching and learning through effective development and sharing of educational innovations and pedagogical knowledge” (Iiyoshi & Kumar, 2008, p. 5). Indeed, they argued that OER collections can enable teachers to better understand how others create and reuse resources and thus build upon one another’s experience and practical knowledge precisely because such collections facilitate the finding, reuse, adaptation and public sharing of resources (Iiyoshi & Kumar, 2008). Other authors concur about the role of OER and OEP in improving teaching quality (West & Victor, 2011); facilitating communities of teachers to “collaborate, share, discuss, critique, use, reuse and continuously improve educational content and practice” (Petrides, Jimes, Middleton-Detzner & Howell, 2010, p. 390); and developing innovative approaches to teaching and learning (Camilleri, Ehlers & Pawlowski, 2014, p. 12). Wiley (2017) has recently coined the term ‘OER-enabled pedagogy’ to describe “the set of teaching and learning practices only
possible or practical when you have permission to engage in the 5R activities”, practices which may enable new pedagogies.

**Sharing and reuse**

Sharing is central to the OER movement and its advocates maintain that sharing is a good thing (Hylen, 2006; OECD, 2007; Rolfe, 2012) and that education itself is primarily about sharing (Wiley & Green, 2012; Cronin, 2017). In the business case of the *Good intentions* report, a Jisc-funded study on sharing learning materials, McGill, Currier, Duncan and Douglas (2008) suggested a number of benefits that sharing learning resources bring to the global community, at national and at institutional level, and for teachers and learners. However, in the literature, there is little evidence that this practice takes place. Petrides et al. (2008) indicated that, although the access to and reuse of OER by learners and teachers has been investigated, there is less evidence that people share the OER they produce and reuse the OER of others. Wiley et al. (2014), discussing “the remix problem” lamented the fact that “while authors and creators go to great lengths to correctly license open educational resources, there is little empirical evidence that people actually exercise the additional 4R permissions granted by the Creative Commons licenses” (p. 63). The research literature, then, seems to indicate there is little evidence of reuse. According to Dimitriadis, McAndrew, Conole and Makriyannis (2009), after a number of years in which various prestigious OER projects were set up (such as MIT’s OpenCourseWare or the OU’s OpenLearn), and despite the considerable support from generous funders (such as the William and Flora Hewlett Foundation), OER repositories had not yet been widely adopted by learners and teachers as part of their daily practice. As Conole (2008, 2010) has pointed out, there seems to be a gap between “the potential of technologies for learning and their actual use in practice” (Conole, 2010, p. 483).

Dimitriadis et al. (2009, p. 200) suggested that one of the reasons for the disappointing level of adoption of OER and the integration into daily practice is that “teachers do not fully understand the resources and therefore they cannot effectively reuse them”. Conole (2010), in another context, explains that “teachers lack the necessary skills to make informed judgements about how to use technologies and are bewildered by the possibilities” (p. 483). Abeywardena (2012), reporting on the reuse and adaptation of OER from the point of view of the technologies available, also agrees that “the reuse aspect of OER is yet to pick up momentum”, and points to both “the lack of accessible technologies and the lack of technical capacities among the academic communities to effectively and meaningfully repurpose OER material for their teaching and learning needs” as two of the main inhibiting factors (Abeywardena, 2012, p. 50). Lane and McAndrew (2010) also agree that, within the OU’s OpenLearn, and as observed by others in other contexts, the success of the cycle of adoption, reworking and recontribution of OER to repositories has been limited, “often with greater success coming from organised groups than from individuals” (Lane & McAndrew, 2010, p. 959). Wiley et al. (2014) have argued that, although OER are designed to be reused, this “does not guarantee that eventual reusers will be sufficiently competent in the technical or pedagogical skills necessary to make needed changes”.

More recently, Judith and Bull (2016) have claimed that “knowledge-related challenges’ to the implementation of OER are due to the “lack of practitioner knowledge and self-efficacy in using OER”, including “insufficient digital literacy and lack of awareness regarding possibilities for OER use as barriers to OER uptake”. Although they recognise that some believe that these may be decreasing in importance (Falconer, McGill, Littlejohn & Boursinou, 2013), they argue that others (Panke, 2011;
Armellini & Nie, 2013), believe that challenges due to lack of user knowledge remain significant (Judith & Bull, 2016).

‘Dark reuse’

Another researcher who has reported on the dearth of ‘real world’ (i.e. not experimentally contrived) reuse of OER is Duncan (2009). In a blog post discussing Duncan’s thesis, which he supervised, David Wiley went as far as to say that “to me, this study begins to confirm the ‘dirty secret’ of OER – that the reuse emperor has no (or only very scanty) clothes” (Wiley, 2009c).

Wiley has commented widely on the dearth of empirically verifiable OER research (Wiley D., 2009b, Wiley et al., 2014), and has questioned whether reuse of OER was indeed occurring (Wiley, 2009a). He explains that the most frequent argument made against this concern is that “reuse and adaptation are happening in other places, […] you just can’t see them” (Wiley 2009a) – an argument since made, for instance, by Glennie, Harley and Butcher et al. (2012), who suggested that much reuse might indeed be happening ‘below the radar’. Wiley argues that OER apologists have created a construct akin to dark matter, which he calls ‘dark reuse’. Unlike the

“dark matter construct [which] was created to explain unanticipated-but-observed behavior, the dark reuse construct is created to explain anticipated-but-unobserved behavior. Rather than accepting the message of data which indicate that reuse is occurring only very infrequently, the apologists imagine an unobservable space offline in which reuse must surely be occurring” (Wiley 2009a).

According to Wiley, then, it would seem that ‘dark reuse’ is a mere construct to justify the apparent lack of reuse. Indeed, the data gathered through metrics and other OER tracking methods suggests that the resources in OER collections are seldom adapted and shared again with the community.

This paper is one of the first studies to specifically address the paucity of empirical work exploring the efficacy of the OER lifecycle model in practice. Its distinctive contribution is to shed light on the practices and contexts of OER use by teachers as a basis for validating the OER lifecycle model and providing evidence of so called ‘dark reuse’.

Context of the study

As Cronin (2017) reminds us, engagement with OER is “complex, personal and contextual”. This case study explores the individual practices and contexts of OER engagement of 12 language teachers teaching French and Spanish undergraduate courses at The Open University UK. The teachers have access to an institutional repository of OER for language teaching (http://www.loro.open.ac.uk) which contains collections of teaching resources, including whiteboards and teachers’ notes. The OER repository, established with funding from Jisc (Digital Repositories Start-up and Enhancement Programme, 2009-2010), contains around 4000 resources, mostly produced at an institutional level by the course leaders for other course staff, who are part-time associate lecturers, to use in the delivery of the courses (Comas-Quinn & Fitzgerald, 2013).

The repository analytics provide information about the number of times it has been accessed, the number of resources in the collection, and the number of registered users, amongst others. Each repository resource page also has statistics about the number of times the resource has been downloaded, and the number of page hits.

In this project, like in other similar ones (Rolfe, 2016), the analytics from the repository provide evidence that teachers engage in the first stage in the OER lifecycle, ‘finding’. However, the analytics
data does not offer any evidence of reuse, as teachers don’t make use of the ‘comment’ or ‘like’ facilities that might have provided a hint of whether the materials were being reused. Similarly, the quantitative data provided by Google Analytics gives information about website traffic patterns, including numbers of visitors, their location, the number of pages they visit, and the duration of their visit, but not about the actual engagement of teachers with the resources. Indeed, the quantitative data available does not provide any information about how the resources are being used, such as whether the teachers adapt resources. Only a small number of teachers have uploaded their own resources, and even fewer have uploaded any derivative materials, i.e. those resources that are new versions of OER already in the repository and thus demonstrate repurposing by teachers.

As an example, Figure 1 shows, the resources for the French beginners’ course: out of the 64 resources available, 51 (80%) were developed by the module leaders (OU in the table), and the remaining 14 were uploaded by 6 out of the 68 associate lecturers on the course (T, for teacher); five of the six uploaded one or two resources each.

![Figure 1: Uploads of Beginner French Resources in LORO](image)

**Research methods**

The case study discussed in this paper sought to understand the teachers’ engagement with the resources from the specific OER repository for language teaching as they prepared a forthcoming language class. Each of the 12 teachers was observed as they engaged in the preparation of two consecutive lessons, during which the researcher engaged them in a professional conversation around the resources they were planning to use for each of the upcoming lesson.

Professional conversations are “discussions among those who share a complex task or profession in order to improve their understanding of, and efficacy in what they do” (Britt, Irwin & Ritchie, 2001, p. 31). Drawing on Bullough and Pinnegar (2001), Schuck, Aubusson and Buchanan (2008) argue that “teachers and other professionals negotiate their understandings of practice through reflection and learning conversations” (Schuck et al., 2008, p. 216) or, as Senge (2006, p. 8) describes them, “learningful
conversations that balance inquiry and advocacy, where people expose their own thinking effectively and make that thinking open to the influence of others”. The aim of professional conversations is to provide opportunities for teachers to engage in professional learning (Schuck et al., 2008); thus, they do not simply describe or discuss the practice, but explore the reasoning that underlies those practices, they ‘maximize thoughtfulness on the part of the teacher’ and investigate, where relevant, alternative courses of action (Danielson, 2009). In that sense, professional conversations provide a useful framework though which to try to understand the professional practices of teachers as they engage with OER.

After each teaching session, a second professional conversation centered on the teacher’s evaluation of the teaching session, a discussion of what resources had actually been used, and how they had been used. Because of the distributed location of the teaching staff, and the online delivery of the teaching at our university, the professional conversations took place online, using the audiographic online conferencing system also used for classroom teaching, so that the teachers could share with the researcher the resources they were planning to use or had used in their lesson. The multimodal data generated through the observations was analysed using applied thematic analysis, an inductive analysis involving a bottom-up, data-driven approach which is well-suited to exploratory studies such as this one (Guest, MacQueen & Namey, 2012).

**Findings and discussion**

The teachers in this study were observed on a one-to-one basis as they prepared two lessons, engaging in professional conversations with the researcher around the choice of resources for the lesson, and any changes they were making to the resources. The researcher met with each of the teachers again after the lessons to discuss how effective the resources had been, and to ascertain whether any further adaptation had occurred.

As shown in Table 1, the 12 teachers used a total of 151 resources between them for the first tutorial discussed. The average was 12.58, and the median was 13 (F indicates French teachers, S, Spanish teachers).

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Number (total 151)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1</td>
<td>6</td>
</tr>
<tr>
<td>S1</td>
<td>8</td>
</tr>
<tr>
<td>F2</td>
<td>9</td>
</tr>
<tr>
<td>S2</td>
<td>10</td>
</tr>
<tr>
<td>S3</td>
<td>12</td>
</tr>
<tr>
<td>S4</td>
<td>12</td>
</tr>
<tr>
<td>S5</td>
<td>13</td>
</tr>
<tr>
<td>S6</td>
<td>13</td>
</tr>
<tr>
<td>F3</td>
<td>13</td>
</tr>
<tr>
<td>S7</td>
<td>15</td>
</tr>
<tr>
<td>F4</td>
<td>18</td>
</tr>
<tr>
<td>S8</td>
<td>22</td>
</tr>
</tbody>
</table>
Out of those 151 resources, more than 40% came from the institutional OER repository, LORO, just over 30% were created by an individual teacher, and 15.8% of the resources came from other teachers (Table 2). There is therefore evidence that teachers find a large percentage of the resources they use in the repository, demonstrating that the first stage of the OER lifecycle, ‘find’, is indeed part of the practice of the teachers in the study.

Table 2: Provenance of resources used in the first tutorial discussed

<table>
<thead>
<tr>
<th>Provenance of resource</th>
<th>Number (total 151)</th>
<th>% total (rounded up)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LORO</td>
<td>65</td>
<td>43%</td>
</tr>
<tr>
<td>Own resource</td>
<td>48</td>
<td>31.7%</td>
</tr>
<tr>
<td>Another teacher</td>
<td>24</td>
<td>15.8%</td>
</tr>
<tr>
<td>Found on the web (online image)</td>
<td>6</td>
<td>3.9%</td>
</tr>
<tr>
<td>Slide capture from course book</td>
<td>5</td>
<td>3.3%</td>
</tr>
<tr>
<td>other</td>
<td>3</td>
<td>1.9%</td>
</tr>
</tbody>
</table>

According to the OER lifecycle, after the resources have been found, they are composed, adapted and (re)used. In this study, these three stages of the OER lifecycle are considered together, as adaptation subsumes composing and reusing: indeed, resources are pulled together with others to compose a teaching sequence, some are then also adapted, and then (re)used in class.

Of the 151 resources analysed, 103, or nearly 70%, had been created by others (OER found in the repository, resources created by other teachers and shared elsewhere, or resources found online or in the course books). During the professional conversations, teachers discussed changes they had made to 72 of them (or 70% of the total analysed), and these form the basis of the following discussion.

When teachers planned their tutorials, they were all involved in ‘composing’, in the sense that they all took resources from the repository or from other sources (including other teachers) and organised them in a logical, coherent teaching sequence according to the aims of their teaching session, mixing them with resources they had created themselves. As some of the OER from the repository consisted of several steps, sometimes they also added or deleted steps, thus adapting the OER to the new context in which they were using it.

As table 3 shows, the most frequent type of adaptation was making physical changes to specific OER, usually changing the wording or the visuals. Teachers also changed the use they were making of OER without making any physical changes to the resources themselves, such as by turning an activity to practise a specific grammatical structure into a communicative game, for instance. The evidence from the study is that the teachers’ practices around composing, adapting and reusing validate those phases of the OER lifecycle.
Table 3: Types of adaptation and number of instances discussed

<table>
<thead>
<tr>
<th>Adaptations made to the resources in the first tutorial observed</th>
<th>Total resources discussed: 72</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numbers indicate the number of instances such changes were discussed</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physical changes to the resources (i.e. to the slides)</th>
<th>34</th>
</tr>
</thead>
<tbody>
<tr>
<td>– Changes to wording</td>
<td>23</td>
</tr>
<tr>
<td>– Changes to the look (font, layout, visuals)</td>
<td>9</td>
</tr>
<tr>
<td>– Changes to the slides AND the activity</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Changes to the use of the resource (but no physical change to the resource itself)</th>
<th>17</th>
</tr>
</thead>
<tbody>
<tr>
<td>– Adding steps to an activity</td>
<td>9</td>
</tr>
<tr>
<td>– Changing the pedagogical use of the activity</td>
<td>5</td>
</tr>
<tr>
<td>– Removing steps from an activity</td>
<td>2</td>
</tr>
<tr>
<td>– Adapting the way the resource is used to suit different contexts, styles or aims</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Changes to the technical arrangements suggested in the resource notes about the conferencing system tools (e.g. use of breakout groups, use of chat function, etc.)</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>– Simplify activity by using fewer tools from those suggested in the teaching notes available with the resource</td>
<td>5</td>
</tr>
<tr>
<td>– Use of additional tools to enhance the activity</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Changes to a group of slides</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>– Adding slides to an activity for review after the class</td>
<td>8</td>
</tr>
<tr>
<td>– Adding slides to an existing multi-slide resource</td>
<td>1</td>
</tr>
<tr>
<td>– Selecting only some of the slides from a multi-slide resource</td>
<td>1</td>
</tr>
</tbody>
</table>

As far as the last phase of the OER lifecycle, sharing, the study found that none of the teachers shared their original or adapted resources via the repository. On the other hand, they appreciated of colleagues who share (S3: ‘Yes its very nice of these people to share them, because it all takes time, doesn’t it, to create these slides’), and four of the teachers explained that they were not averse to sharing with colleagues in principle (F2: ‘I’m not averse to it, you know… it sounds like I’m keeping everything to myself! I do like sharing resources…’)

There have been a number of studies on the barriers and enablers of OER production and reuse at macro, meso and micro levels (Byskov Lund, 2010; Windle et al., 2010; McGill, Falconer, Littlejohn and Beetham, 2012; Pegler, 2012; Petrides et al., 2008; Clements & Pawlowski, 2012). In terms of sharing, the barriers, enablers and drivers at micro level, which are the most likely to affect individual teachers in their everyday practice, are summarised in Table 4.
Table 4: Barriers, enablers and drivers to sharing (micro level)

<table>
<thead>
<tr>
<th>Barriers:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- lack of skills (Windle et al., 2010);</td>
</tr>
<tr>
<td>- undermining the uniqueness of one’s individual teaching (Bates, Loddington, Manuel &amp; Oppenheim, 2007);</td>
</tr>
<tr>
<td>- fear of criticism (Wenk, 2010; van Acker et al., 2014);</td>
</tr>
<tr>
<td>- lack of reward (Wenk, 2010);</td>
</tr>
<tr>
<td>- lack of time (Rolfe, 2012; Windle et al., 2010);</td>
</tr>
<tr>
<td>- lack of confidence in the quality of one’s materials (Bates et al., 2007; Windle et al., 2010).</td>
</tr>
<tr>
<td>- lack of confidence or knowledge about copyright and IPR of (Clements &amp; Pawlowski, 2012; Rolfe, 2012; Hassler et al., 2014)</td>
</tr>
<tr>
<td>Enablers:</td>
</tr>
<tr>
<td>- availability of open licences (Nikoi &amp; Armellini, 2012);</td>
</tr>
<tr>
<td>- one’s confidence in subject knowledge and teaching skills (Masterman, Wild, White &amp; Manton, 2011).</td>
</tr>
<tr>
<td>Drivers</td>
</tr>
<tr>
<td>- personal satisfaction (Wenk, 2010);</td>
</tr>
<tr>
<td>- increased reputation (Hylén, 2006; Wenk, 2010; Rolfe, 2012; van Acker, van Buuren, Kreijns &amp; Vermeulen, 2013);</td>
</tr>
<tr>
<td>- reward in the form of altruism and reciprocity (van Acker et al., 2013).</td>
</tr>
</tbody>
</table>

When discussing whether they shared the resources they produced or adapted, the main reason provided by the teachers for not sharing resources was lack of time, mentioned by 6 teachers. Other reasons included lack of confidence, technical issues (including technical skills and issues around copyright), and the fact that it was not a priority for them (all barriers mentioned by three teachers each). Some also indicated that the changes they had made to the resources were only meaningful to them in their own context and would be of little interest to other teachers.

In this study, a number of responses might be particular to teachers working in the context of a distributed distance university, where teachers work from home and interact with staff and students mostly online. Indeed, four of the teachers mentioned distance and working in isolation as a barrier to sharing; one mentioned the lack of feedback; and three the fact that they were not sure how useful sharing their resources would be to others.

These barriers all seem to relate to the fact that OU ALs do not know each other very well, so there is a certain reticence or even shyness to sharing with people who are practically strangers, and this might relate to the issue of trust. Clements and Pawlowski (2012) define trust in the context of reuse as “teachers being able to rely on certain OER through relying on individuals who created them or recommended them, or to rely on the organizations that these individuals belong to” (Clements & Pawlowski, 2012, p. 7). For them, “trust facilitates reuse of OER”, especially when it comes to searching and evaluating the resources (Clements & Pawlowski, 2012, p. 12). Whilst trust in resources, organizations, and technologies might be particularly important when locating and evaluating OER, this study shows that trust, in the sense of managing the risks of not knowing the others one might be sharing with, is particularly important in the sharing phase of the OER cycle.

Although when asked if their shared through the repository all teachers said they did not, through the professional conversations it became apparent that they did share in other contexts: some shared the resources with colleagues on the teachers’ forum on their course website, some shared in the context of professional development activities, or when mentoring colleagues, and many shared with students before and/or after the lesson (including with students who had not attended). Those who also worked or had worked in institutions where there was a physical staffroom, shared their resources with colleagues. This finding concurs with that of van Acker, Vermeulen, Kreijns, Lutgerink...
and Van Buuren (2014), who, in a study of 1568 teachers in the Netherlands, found that “teachers hardly seem reluctant to share, they merely seem to refrain from sharing on the Web” (p. 142).

This finding also indicates that the barriers to sharing mentioned by teachers to justify why they do not share their resources through the OER repository vanish when the sharing context changes. Indeed, teachers are willing to spend time sharing their resources with students or with close colleagues, and technical issues and lack of confidence do not seem to be a barrier in those contexts. Similarly, teacher do not question the usefulness of sharing in these contexts, or feel it is not a priority. As noted by Pegler (2012), the issue of what motivates teachers to share seems indeed to be an important one.

The study found evidence of ‘dark reuse’, or reuse activity in spaces beyond the repository, and therefore not observable through traditional quantitative methods. To understand the practices -both public and private- that are taking place in the teachers’ engagement with OER, it is useful to think of two views that show the complexity of the OER ecosystem. First of all, the repository view (Figure 2) shows the practices that are very much evidenced by the data from the analytic tools: the repository contains OER shared by the course leaders (the producers); teachers (the users), simply find and use the resources they need for their teaching; in this view, there is no evidence of reuse, adaptation or sharing.

The second view (Figure 3) shows a composite of the practices observed in this study from the resource view. As well as finding resources from the OER repository, a teacher might use resources from other sources, including those previously shared by colleagues privately. Some of these are adapted and other used as found, but all are composed into a teaching sequence appropriate for the context of the lesson and are therefore reused in this context. The teacher then shares the resources with students during the lesson, and might adapt them further after the lesson, adding supplementary explanations or examples, and share those too with students. Both the teacher and the students retain these resources in their personal collections. The teacher might also share some of the components with other colleagues. What is crucial is that all these practices, other than those linked to the OER repository, are invisible if looking the data available through the repository’s analytics.
Limitations and further research

The study had a number of limitations. The numbers of participants, twelve (eight Spanish and four French) represented 16% out of a total of the 72 Spanish and French teachers teaching on the beginners modules. Whether the participants constituted a representative sample is open to question; they were, after all, self-selected, and therefore probably more interested than most in OER or in their own professional development. The case itself in a case study, however, is made up of the data generated in interaction with those particular individuals, and in that sense, the large amount of rich data generated, and the thick descriptions (Geertz, 1973) produced, help "to understand the processes, cultures, decision-making, and so on, within the research site. The findings and, in turn, the validity, will rest on these descriptions" (The Open University, 2013b, n.p.). Where possible, data was triangulated (by checking the consistency of practices across the preparation of two lesson observations, and by

using the repository analytics to check the provenance of the OER discussed). However, it is true that further studies might be needed to ascertain how typical the behaviour observed might be across more than one instance. A longitudinal study of the same population would enable the researcher to understand the changing nature of Open Educational Practices, as the adoption of new practices takes time. Similarly, conducting similar qualitative studies with users of other OER repositories would also provide additional data to verify the claims around OER practices and ‘dark reuse’.

**Conclusion**

Based on a qualitative investigation of real-life practices, the research provides empirical evidence to validate the OER lifecycle model. Teachers in the study engaged with all five phases of model (finding, composing, adapting, and, crucially, reusing and sharing OER) but the study found that most of these practices, other than those directly related to the teachers’ engagement with the OER repository itself, are hidden, and take place in private spaces. The study therefore also provides evidence that so-called ‘dark reuse’ is a strong element of the teachers’ engagement with OER.

The invisibility of much OER reuse as evidenced in this study is at odds with the current trend to employ metrics to evaluate the success or otherwise of OER collections. The study serves as a warning about the shortcomings of the current reliance on quantitative data to evaluate the success or otherwise of OER collections. Qualitative evaluation tools such as the ones used in this study, and which are sensitive to the situated nature of OER engagement, need to be harnessed in order to understand the invisible practices around ‘dark reuse’. Indeed, this study demonstrates that there is a need for more sophisticated methods that embrace and evidence the complexity of OER ecosystems.

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Open Textbooks in an Introductory Sociology Course in Canada: Student Views and Completion Rates

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Abstract

Open educational resources (OER), including open textbooks, are free, adaptable learning resources. The integration of these materials in place of commercial textbooks allows for considerable financial savings for students and creates opportunities for more active and engaged learning. The growing interest in the use of OER at a Western Canadian university led to the chance to survey students for their feedback on using OER instead of traditional commercial textbooks. This paper focuses on the views of students in an introductory sociology course for which an instructor adopted an open textbook and otherwise left the course unchanged from when it was taught with a traditional textbook. In addition, completion rates for the offerings with the open textbook are compared to previous offerings with a commercial textbook.

**Keywords:** Open educational resources, OER, textbooks, open textbooks

Introduction

The cost of textbooks for post-secondary education in the United States rose more than 1,000% between 1977 and 2015, a rate three times that of inflation (Popken, 2015). As a result, students appear to be less likely to purchase required resources and more likely to register in fewer courses or drop courses because of the cost of these materials (Florida Virtual Campus, 2016). In an effort to deal with this problem, and improve learning outcomes, post-secondary institutions throughout North America are exploring the use of open educational resources (OER) in place of commercial textbooks.

The United Nations Educational, Scientific, and Cultural Organization (UNESCO) defines OER as

> “any type of educational materials that are in the public domain or introduced with an open license. The nature of these open materials means that anyone can legally and freely copy, use, adapt and re-share them. OERs range from textbooks to curricula, syllabi, lecture notes, assignments, tests, projects, audio, video and animation” (UNESCO, n.d.).

Not only does the integration of OER in place of commercial textbooks save students money, but the nature of the licensing of these resources allows educators to modify them to meet local needs. Textbooks can be shaped around the course instead of the other way around. The potential benefits of OER go beyond those that directly affect learners and instructors, but also
extend to the institution as a whole. If students can afford to enrol in and complete more courses, universities and colleges may retain more tuition dollars. As Wiley, Williams, DeMarte and Hilton (2016) note, given that most costs associated with teaching courses are fixed, if using OER in more courses could lead to students being able to take more courses or drop fewer courses, this could potentially provide enough tuition revenue to offset the cost of adopting and sustaining OER in those courses.

This article will explore the integration of OER at a public university in Western Canada, focusing on a first year sociology course. Researchers were able to compare iterations of this course with an instructor using a commercial textbook and those by the same instructor using an open textbook in a later term. The results show promise, which is encouraging as the adoption of OER in higher education throughout North America and in other parts of the world continues to grow.

**Literature Review**

**Impacts of commercial textbook costs**

In Florida, surveys were conducted in 2016 with over 20,000 post-secondary students in 40 institutions. The aim of the research was to determine the effect of textbook costs on the students’ access to post-secondary education as well as on student achievement. The surveys showed that the rising cost of these materials was negatively affecting student outcomes: students reported lower grades and a reduced ability to enrol and complete courses in a timely manner that would enable them to finish their programs. The researchers found that 67% of students reported not purchasing a required textbook for a course at least once, 46% indicated that they avoided taking certain courses because of the cost of the required textbooks, while 48% said that they had to register for fewer courses because of this expense (Florida Virtual Campus, 2016). In addition, 46% of students said that they had at some point either dropped or withdrawn from a course due to the cost of the text, and 38% of students responded that due to their inability to afford the text for a course, they had earned a lower grade in the course.

Researchers in Canada have also found post-secondary students reporting similar problems with the costs of commercial textbooks. Jhangiani and Jhangiani (2017) conducted a survey of 320 undergraduate students in 12 post-secondary institutions in British Columbia, in which 54% of students said they had decided not to purchase a required textbook for a course due to cost, at least once. Students also reported doing the following things because of textbook costs (either rarely, sometimes, often, or very often): 26% said they had chosen not to register for a particular course, 27% had taken fewer courses, 17% had dropped a course, and 30% reported earning a lower grade in a course. The authors note that those who reported working more hours outside of their studies were more likely to report dropping courses and earning lower marks.

In a smaller survey of students in a first-year, undergraduate Physics course at the University of British Columbia Vancouver, Hendricks, Reinsberg and Rieger (2017) reported fewer percentages of students taking similar actions due to textbook costs. Out of 150 respondents, 57% said they had not purchased a required textbook for a course at least once. In addition, 25% said they had rarely, sometimes, often or very often chosen to register in a different section of a course because of costs, 19% said they had taken fewer courses, and 16% said they had dropped or withdrawn from a course (the survey did not ask students whether they had earned a lower grade in a course). It is important to note that the respondents in that survey were mostly first year students (85%), and thus probably did not have much post-secondary education experience to report on (though they were surveyed at the end of their first year).
Research has shown that instructors are increasingly recognizing that students have difficulty affording textbooks (especially given the rising cost of tuition and housing that many students face), leading to a growing interest in OER (Harley, Lawrence, Acord & Dixson, 2010; Petrides, Jimes, Middleton-Detzner, Walling & Weiss, 2011; Pitt, 2015; Belikov & Bodily, 2016; Martin, Belikov, Hilton, Wiley & Fischer, 2017; Ozdemir & Hendricks, 2017). Open textbooks in particular have been a key element in lowering student costs. The open textbook project from British Columbia’s BCcampus, the leader of the OER movement in Canada, has resulted in students in British Columbia saving approximately $9 million since that project’s inception in 2012 (BCcampus, n.d.).

**Student perceptions of OER**

Multiple studies show that most students using open textbooks or other OER believe they are of equal or better quality than commercial textbooks (see Hilton, 2016 for a meta-analysis). In a large survey of 1299 students in two first-year Biology courses at the University of Georgia that used an OpenStax open textbook, Watson, Domizi and Clouser (2017) report that 64% of respondents rated the quality of the open textbook about the same as other textbooks they had used, and 22% rated it higher. Clinton (2018) reports on a survey of students in two versions of an introductory psychology course taught by the same instructor in the U.S.: one using a commercial textbook and another in a later term using an open textbook. Students rated the quality of textbooks similarly, with visual appeal being rated slightly more highly in the commercial textbook, and the quality of writing being rated slightly more highly in the open textbook.

In the Canadian post-secondary education context, Jhangiani and Jhangiani (2017) reported that, out of 320 undergraduate students across British Columbia using various open textbooks in their courses, 33% rated their open textbooks as of “average” quality, while 63% rated them above average or excellent. When asked if they would have preferred to purchase a traditional textbook for their course, 56% of students in this study disagreed slightly or strongly, and 24% neither agreed nor disagreed (20% agreed slightly or strongly). According to Hendricks, Reinsberg and Rieger (2017), 93% of 143 students in a first-year Physics course in British Columbia said that the quality of their open textbook was about the same (72%) or better (21%) than that of textbooks used in their other courses. The majority of students (64%) disagreed somewhat or strongly that they would have preferred to buy a traditional textbook for the course, with 18% neither agreeing nor disagreeing (18% agreed somewhat or strongly).

Finally, Jhangiani, Dastur, LeGrand and Penner (2018) surveyed 178 students in seven sections of an introductory psychology course in British Columbia, some of which used a commercial textbook while others used an open textbook. Across the different sections, students using the open textbook (in print or digital format) rated it the same or better as those using the commercial textbook, across multiple dimensions, including clarity of writing, helpful examples, visual appeal, and more.

The present study also considers students’ ratings of the importance of various non-content features of their open textbook, following up on similar research by Jhangiani and Jhangiani (2017). The latter found that the following were rated by students as very important or absolutely essential: immediate access (70%), cost savings (68%), convenience/portability (54%), ability to print (41%), ability to share the book with others (34%). They also reported that most students accessed their open textbook in digital format, with 72% downloading a PDF, 50% reading it online and 43% using a print version.
Efficacy of OER (grades, persistence)

Several recent studies have examined the efficacy of open textbooks across multiple sections of the same course, finding that in most sections of a course where an open textbook was used students performed at least as well academically as those in the sections using a commercial textbook. Colvard, Watson and Park (2018) evaluated student grades (including DFW—grades of D, F, or Withdrawal) in eight courses at the University of Georgia taught by the same instructors over multiple semesters, including those where traditional textbooks were assigned and those using open textbooks instead. They found that across the courses there were higher grades, including lower DFW, for the sections using the open textbooks than for the previous sections that did not. The reduction in DFW was highly significant for students eligible for Pell grants (a marker for financial need), non-White students, and part-time students.

Clinton (2018) studied 520 students in an introductory psychology course taught by the same instructor using a commercial textbook in one semester and an open textbook in another. Course grades were slightly better for the students using an open textbook, though Clinton notes that the average high school GPA for that section of the course was also higher. There was a statistically significant reduction in students withdrawing from the open textbook section, even though the high school GPA’s for the students who withdrew in the two semesters were similar.

Allen, Guzman-Alvarez, Molinaro and Larsen (2015) focused on Chemwiki, an open textbook in the format of a wiki. They compared academic performance across multiple assessments (two midterms and final) between two sections of the same chemistry course (one using the ChemWiki and the other using a commercial textbook), with both having the same instructor, teaching assistants, questions, and rubrics. The researchers found no statistical difference between the academic performance on these assessments between the two sections.

In Fischer, Hilton, Robinson and Wiley (2015), the researchers looked at overall academic performance and completion rates for 15 courses across multiple institutions, comparing sections of a given course (at the same institution), with at least one section using a commercial textbook (the control group) and at least one section using open educational resources (OER) (the treatment group). In nine of the courses, there was no statistical difference between the academic performance of students in the control group compared to the treatment group. In five of the courses “students in the treatment condition were more likely to pass the course than students in the control condition” (Fischer et al., 2015, p. 167). Only students in one course in the control group were more likely to pass and had higher marks than those in the treatment group. The treatment section, however, did have a significantly higher completion rate than the control group.

In Canada, Jhangiani et al. (2018) reported that students in sections of an introductory psychology course using an open textbook scored higher on one of three non-cumulative exams than those in sections using a commercial textbook. There were no significant differences on the other two exams. Controlling for instructor difference, the same result was found for sections taught by the same instructor when using a commercial and an open textbook.

Most studies of student perceptions and efficacy of open textbooks in colleges and universities are from the United States; the present study adds to and builds upon the relatively small amount of literature on these topics so far in Canadian post-secondary education.

Context for the present study

The University of Saskatchewan is a medical doctoral university in Western Canada. The first large adoptions of open textbooks were in 2015, in an economics course and a chemistry course,
Other adoptions followed that year and the number of students benefiting from the integration of open textbooks rose to more than 900 for the 2015-2016 academic year. That same year the provincial government began providing a small amount of money to the province’s three largest post-secondary institutions (University of Saskatchewan, University of Regina, and Saskatchewan Polytechnic) for the purpose of creating or adapting open textbooks and other OER. This funding was used in 2016, for the first known adaptation of an open textbook at The University of Saskatchewan. Graduate students were paid to adapt an existing open textbook for a first year course in the Edwards School of Business. From 2016-2017, over 2700 students benefited from the open textbook initiative at the University of Saskatchewan, in 22 courses (total number of students in courses, not unique students).

Given the increase in the number of students benefiting from the use of OER at the University of Saskatchewan, the growing interest in the use of OER among instructors, and the need for ongoing support from the institution, the centre for teaching and learning decided to begin evaluating the initiative by surveying students about their views on the open textbooks being used in their courses. We adapted a survey based on one by Bliss, Robinson, Hilton and Wiley (2013) and during the 2016-2017 academic year we requested that instructors using open textbooks distribute the link to the online survey to the students in those courses. While most instructors agreed to do this, the response rates were very low in all but one course, Introduction to Sociology.

The instructor for this introductory sociology course had taught the course for several years prior to adopting the *Introduction to Sociology - 2nd Canadian Edition* (Little, 2017) open textbook from BCcampus in the Fall of 2016. This provided the opportunity to not only survey students to obtain their views of the open textbook, but also to compare overall course grade averages and completion rates with previous offerings of this same course taught by the same instructor using a commercial textbook.

**Methods**

At the end of 2016, after the term in which students used the open textbook, the instructor emailed the survey link to the students in both sections of the Introduction to Sociology course, and sent periodic reminders during the month that followed. The email and preamble to the survey both stated that completion of the survey was voluntary, and that the researchers and the instructor valued their feedback about the open textbook used in that course.

The survey consisted of 14 items, a combination of multiple-choice, likert-style, and open-ended questions. It asked for students’ views of the quality of the open textbook, by asking how they would rate the quality of the open textbook compared to other textbooks they’ve used previously, and whether they would have preferred to purchase a commercial textbook for the course instead of use the open textbook. Students were also asked to rate the level of importance to them of the following features of the book: cost savings, immediate access, convenience & portability of the digital format, ability to print pages, ability to keep forever, ability to share with others. There were also open-ended questions asking students to explain their ratings and whether there are any other features they liked or disliked. Finally, there were questions about the format in which students read the textbook (e.g., PDF, epub, print), and whether they were aware of the printing services offered by the campus bookstore.

Of the 343 students who completed the course in the Fall of 2016, 129 answered some survey questions and 119 answered all survey questions, for a response rate of 35%.
Once term grades were submitted, researchers were granted access by the instructor and Department Head to overall course grade averages and completion rates for both sections, and for the sections the instructor had taught during the previous two years for comparison.

**Results**

**Survey results**

The survey asked students to rate the quality of the textbook compared to traditional commercial textbooks they had used in other courses. Students gave the open textbook high marks, with 72.8% rating it as excellent or above average compared to traditional textbooks they had used in other courses (Table 1). It is important to note that as this is an introductory course; most students were likely in their first or second year of study and may not have yet had many commercial textbooks to compare to the open textbook in sociology.

Students were also asked to rate their agreement with the statement, “I would have preferred to purchase a traditional textbook (at approximately $100) for this course.” The vast majority of students indicated that they would not have preferred to buy a commercial textbook for this course, with 82.7% of respondents saying that they either “strongly disagreed” or “slightly disagreed” with that statement (See Table 2). The $100 figure, which is used by BCcampus, the U of S, and other institutions and organizations working with open textbooks is an estimated average that each student in a class saves when OER is adopted in place of a commercial textbook. As this survey was sent to students in multiple courses, the $100 was used for all courses regardless of the actual price for the books being replaced by OER. Instructors of the various sections of the introductory sociology course at the U of S have the freedom to choose their own book, with prices for the required commercial textbooks ranging from $85 to more than $150 in Canadian currency.

<table>
<thead>
<tr>
<th>Rating compared to traditional textbooks used previously</th>
<th>Number (percent)</th>
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<tbody>
<tr>
<td>Excellent</td>
<td>59 (45.7)</td>
</tr>
<tr>
<td>Above Average</td>
<td>35 (27.1)</td>
</tr>
<tr>
<td>Average</td>
<td>24 (18.6)</td>
</tr>
<tr>
<td>Below Ave</td>
<td>8 (6.2)</td>
</tr>
<tr>
<td>Very Poor</td>
<td>3 (2.3)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Would have preferred to purchase commercial textbook at approximately $100</th>
<th>Number (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>80 (63)</td>
</tr>
<tr>
<td>Slightly Disagree</td>
<td>15 (19.7)</td>
</tr>
<tr>
<td>Neither Agree Nor Disagree</td>
<td>15 (19.7)</td>
</tr>
<tr>
<td>Slightly Agree</td>
<td>6 (4.7)</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>11 (8.7)</td>
</tr>
</tbody>
</table>
One survey question asked whether certain non-content features of the open textbook were important to students. Overwhelmingly, they indicated that cost savings from the use of an open textbook was important, with 89% saying that this was either “very important” (74%) or “moderately important” (15%) to them. Immediate access was rated by 84% of participants as very or moderately important, with 72% saying the same about the convenience and portability of the digital format. The ability to print the materials was considered very or moderately important by 56% of those who answered the question, while 54% indicated this was the case for the ability to share the materials with others.

Open textbooks are often available in multiple digital formats. *Introduction to Sociology - 2nd Canadian Edition* is available to download as a PDF, ePub file (for use on many eReaders), or Mobi file (for use on a Kindle), or can be read as a website. The freedom of the open license also allows for the book to be printed. Students were asked which format they preferred for using the open textbooks. Most students (57.9%) indicated that they downloaded and read from the PDF, with another 18.2 percent saying they read the book straight from the website and 15.7% saying they had used a printed version.

The University of Saskatchewan bookstore is enthusiastically involved in the OER initiative at the university and offers a print-on-demand service for open textbooks, partnering with the University of Saskatchewan student union’s print shop to offer the service. Students can email a particular contact in the bookstore with the course code and instructor name and a copy of the book will be printed and hole punched mush as a course pack would be, and is generally available within 48 hours. We suggested that instructors using open textbooks in their courses notify students of this service at the start of the term.

One of the survey questions was, “Were you aware of the printing services offered by the University of Saskatchewan bookstore for open textbooks?” Of the 122 students in the introductory sociology course who answered this question, 68.9 percent answered “yes.” Eleven students indicated that they had used the service for a course using an open textbook (not necessarily this course). Finally, students were asked, if they did print the open textbook for the introductory sociology course, did they print it all at once or chapter or pages as needed. Seven students said “all at once”, 18 students said “chapters or pages as needed”, and 94 (79%) said this question did not apply to them.

**Course grades and completion rates**

The researchers also considered the overall course grade average and the completion rate for the introductory sociology courses, for the term in which an open textbook was assigned, and two previous terms as well (all taught by the same instructor). As this course uses normative grading, however, looking at course averages is not a good indicator of whether student learning is affected by the use

<table>
<thead>
<tr>
<th>Preferred format</th>
<th>Number (percent)</th>
</tr>
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<tbody>
<tr>
<td>Electronic version - PDF</td>
<td>70 (57.9)</td>
</tr>
<tr>
<td>Electronic version - ePub</td>
<td>4 (3.3)</td>
</tr>
<tr>
<td>Electronic version - Web</td>
<td>22 (18.2)</td>
</tr>
<tr>
<td>Printed version</td>
<td>19 (15.7)</td>
</tr>
<tr>
<td>Not sure</td>
<td>6 (5)</td>
</tr>
</tbody>
</table>
of the open textbook. It is not surprising that the course average did not change significantly across the two terms when a commercial textbook was used compared to the term when the instructor assigned the open textbook instead. As shown in Table 4, there was no statistical difference between the overall course averages in these courses.

We did not have access to withdrawal rates for this course, so we determined completion rates for these classes by dividing the number of students who were enrolled on the first day of class by the number of students enrolled on the last day of classes for the term. Table 5 shows the details for the three terms for which we examined the data. The course taught by the instructor using the open textbook in the fall of 2016 had a statistically higher completion rate compared to the previous two times that she taught the course. We conducted a one-tail Z-test to determine these results (z=2.53 and p=.0057). This is an important indicator as The University of Saskatchewan charges tuition based on the number of courses in which students enrol, and students are eligible for refunds or partial refunds of tuition for several weeks into the term.

**Discussion**

Supporting previous research in the U.S. and Canada, students in the Introduction to Sociology course studied here had very positive perceptions of the quality of their open textbook: 73% rated it “above average” or “excellent,” and 19% rated it “average,” compared to textbooks they have used previously. As another marker of perceptions of quality, 83% said they would not have preferred to purchase a traditional textbook for this course for $100 Canadian; for Canadian comparators, see Jhangiani and Jhangiani (2017) at 56%, and Hendricks, Reinsberg and Rieger (2017) at 64%, though those two studies did not put a dollar value on the purchase of a commercial textbook. The most important non-content feature of the textbook was cost savings, followed by immediate access, then convenience and portability. Just over half the student respondents to the survey rated the ability to print the book as moderately or very important.

The majority of students accessed the textbook digitally (most on a PDF or on the web), with only 16% using a printed version. This is significantly lower than the 43% of students in British

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<table>
<thead>
<tr>
<th>Term</th>
<th>N</th>
<th>Course Average</th>
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<tbody>
<tr>
<td>January 2015 (commercial text)</td>
<td>146 (1 section)</td>
<td>72.75%</td>
</tr>
<tr>
<td>September 2015 (commercial text)</td>
<td>119 (1 section)</td>
<td>72.25%</td>
</tr>
<tr>
<td>September 2016 (open text)</td>
<td>343 (2 sections)</td>
<td>72.41%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Term</th>
<th>Enrolled at Start of Term</th>
<th>Enrolled at End of Term</th>
<th>Completion Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 2015 (commercial text)</td>
<td>183 (1 section)</td>
<td>146</td>
<td>79.8%</td>
</tr>
<tr>
<td>September 2015 (commercial text)</td>
<td>147 (1 section)</td>
<td>119</td>
<td>81%</td>
</tr>
<tr>
<td>September 2016 (open text)</td>
<td>404 (2 sections)</td>
<td>343</td>
<td>85.3%</td>
</tr>
</tbody>
</table>
Columbia who reported using a print version of their open textbooks, reported in Jhangiani and Jhangiani (2017).

Regarding efficacy, though there was no significant difference in end-of-course grades between the students in the Introduction to Sociology course using a commercial textbook and those in the same course using an open textbook, the fact that this course uses normative grading means we cannot draw a conclusion that the open textbook had any effect on course grades. However, there was a statistically higher course completion rate in the term that the instructor used the open textbook compared with previous terms with a commercial textbook.

Conclusion

This study adds to and supports the literature on student perceptions and efficacy of open textbooks in the Canadian post-secondary education context. We were able to compare grades and completion rates for the same course taught by the same instructor over three terms, two using a traditional textbook and one using an open textbook. To our knowledge, there are only two other studies on open textbooks in Canada that report on efficacy (Hendricks, Reinsberg & Rieger, 2017; Jhangiani et al., 2018) with only one of those (Jhangiani et al., 2018) comparing the same course by the same instructor taking place across more than one term.

While the results of the survey and the course completion rates are encouraging, they are limited to one term of one course, making it difficult to make any broad assessments as to whether students prefer the open textbooks in general to commercial texts due to cost, perceived quality, or both, or if completion rates in other courses at the University of Saskatchewan would also rise with the change to an open textbook. Both of these questions require further study. Unfortunately, the instructor for the introductory sociology course is no longer teaching and currently no other instructors in that department are interested in using the open textbook so we are unable to study that particular course moving forward at this time.

As the open textbook initiative at the University of Saskatchewan continues and more faculty members adopt or adapt open textbooks, further courses will be studied with similar measures as have been used here. While the survey response rates among students in courses other than the introductory sociology course described in this paper were low, an effort to increase the response rate for the student surveys will be made by including a chance to win gift cards.

We will also look for another course where an instructor is adopting an open textbook for a course they have previously taught with a commercial textbook to look at possible changes in grades and completion rates for other courses. If completion rates are higher in courses using open textbooks, this could provide an important incentive for the university to further invest in the OER initiative, as it may help increase revenue.

References


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Differentiation in Access to, and the Use and Sharing of (Open) Educational Resources among Students and Lecturers at Technical and Comprehensive Ghanaian Universities

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Abstract
This paper is the second in a series of three with a common goal to present a fair OER picture for Sub-Saharan Africa, represented by large-scale studies in three countries: Kenya, Ghana, and South Africa. This paper examines a deliberate selection of four Ghanaian universities with randomly sampled students and lecturers. Distinct questionnaires for students and the lecturers have been used, which generated a response from in total 818 students and 38 lecturers. The major outcomes based on the empirical data are: (i) there is a significant digital differentiation among lecturers and students at technical versus comprehensive universities in terms of their proficiency and internet accessibility; and (ii) the awareness and appreciation of the OER concept and open licensing is low but from the actual variety and types of processing by respondents of educational resources (not necessarily open) there is a preparedness for openness for the future.

Keywords: Educational Resources, Open Educational Resources (OER), ICT, differentiation, access, use, sharing, universities in Ghana, students, lecturers, open education

Introduction
This paper is the second in a series of three with a common goal to present a fair ‘OER picture’ for Sub-Saharan Africa, represented by large-scale studies in three countries: Kenya, Ghana, and South Africa. In the first paper in the series, which focused on Kenya, we have noted that the African traditional setting is characterized by sharing practical wisdom and indigenous knowledge between the elderly and the younger generation (Pete, Mulder & Oliveira Neto, 2017). However, when institutionalized education was introduced in Africa by countries from the Global North it brought along with it proprietary-based principles and mechanisms. With the introduction of Open Educational...
Resources (OER), however, there is an opportunity to restore the traditional African principle of free and open sharing.

OER are defined as

“teaching, learning and research materials in any medium, digital or otherwise, that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions” (UNESCO/COL, 2012).

The enormous potential of OER to simultaneously improve the access to education as well as the quality and efficiency of education (Daniel, 2009; Mulder, 2010, 2013), makes it a strong and logical alternative to proprietary-based learning materials. This holds for any audience, but in particular for those in countries in the Global South.

First, it is necessary to clarify what we mean by ‘open’. An authoritative source in this respect is David Wiley who views that “‘open’ stands for free access plus, however, some formal rights and permissions to be granted to the users” (Wiley, 2016). These can be adopted according to an ‘open licensing’ scheme as offered, for example, by Creative Commons. In the first paper in the series, we have elaborated more on the concept of ‘open’ according to Wiley’s body of thought. In practice, however, quite frequently there is confusion and misinterpretation about OER. For this reason, in all three papers in the series, we use two terms, namely (O)ER and OER. (O)ER we use to capture both expressly openly licensed resources and other digital educational resources where licensing is unknown. OER we use only when educational resources considered align with the open licensing definition expressed by Wiley.

In the series, we study the so-called (O)ER differentiation which is defined as

“the existing inequalities in the use of (O)ER in society, that involves not only unequal access to (O)ER, but goes further to include the inequalities that exist between groups of people in their ability and capability to actually create, use or re-use, repurpose, and holistically utilize (O)ER for individual and common good” (ROER4D, 2017).

While our series focuses on (O)ER differentiation in three countries in sub-Saharan Africa—namely Kenya, Ghana and South Africa—other series in the Research on Open Educational Resources for Development initiative examine this topic in South America and Southeast Asia. From our previous paper we note the following important principle:

“Underlying (O)ER differentiation there is digital differentiation (often called the digital divide) which concerns physical access to new ICT technologies (like internet). Accordingly we can allocate different levels of digital proficiency and of (O)ER proficiency to the key actors in education, students and lecturers” (Pete, Mulder & Oliveira Neto, 2017, p. 174).

In this paper we report on a quantitative study of Ghanaian university students and lecturers. First, we present an overview of the university landscape and the major developments in the areas of information and communications technology (ICT) in education and OER in Ghana. Then we elaborate on the research questions and on the methodology of the study. The core of the paper is an in-depth analysis with the major results and findings for four research questions. The closing section summarizes the conclusions and recommendations.

**Context**

Ghana is a coastal country in West Africa with a population of 28.21 million people occupying a total land area of 238.5 square kilometers (Hilbert, 2016). Over half (55.3%) of the total population
is urban (CIA, World FactBook, 2017). Ghana is considered an emerging economy, with strong economic growth. In 2011, Ghana graduated from low-income status to lower middle income status as classified by the World Bank (2017a). In 2015, Ghana became a member of the Organization of Economic Co-operation and Development (OECD) (Okudzeto, Lal & Sedegah, 2017). Ghana spends 6.2% of its GDP on education. From that education budget, 18% goes toward tertiary education (CIA, World Factbook, 2017; The World Bank, 2017b). The Government of Ghana funds 77.3% of tertiary education in the country (World Bank, 2017b). Nationally, Ghana has 10 public universities, 81 private tertiary institutions offering degrees, and 1 regionally-owned West Africa tertiary institution (NAB, 2017). The majority of the university students are enrolled in public institutions, though the share in private institutions has been growing. For the 2014-2015 academic year, total tertiary enrolment was 320,746, with 248,507 in public institutions (77.5%) and 72,239 private (22.5%). The national enrolment in tertiary education is 13%, with a national target to increase this share to 25% by 2020 (NAB, 2017) The National Education Strategic Plan for 2010-2020 includes an ICT component, calling for the expansion of ICT for instruction at all levels, from primary to tertiary education (MOE, 2014a, 2014b).

Ghana adopted two national ICT in Education policies—one in 2008 and another in 2015 (Jowi, Knight & Sehoole, 2013). Both policies embody the principle of ICT as a means and an end. ICT is presented as a means to improve access to and quality of education and an end in teaching 21st century skills for workplaces with integrated ICT (Tagoe, 2014).

For over a decade, Ghana has pursued a vision of becoming a tech leader for West Africa. Ghana currently has 16 tech hubs, which is among the highest in the region. The other two countries studied in the OER differentiation series score also high in this respect: South Africa with 54 tech hubs and Kenya with 27 (Dahir, 2016). This strategy has grown and strengthened the local ICT workforce and provided talent for ICT initiatives across industries, including education (Tagoe & Abakah, 2014).

Ghana has been active in a number of open, distance, and e-learning consortia and projects. Ghana is a member state of the African Virtual University. In 2014, Laweh Open University College was established as the first Open University in Ghana and the second in West Africa. An initiative to launch the Open Universities of Ghana agency is currently under review with the National Council for Tertiary Education (MOE, 2017). Within the realm of OER, at the university level, two of Ghana’s public universities were founding members of the African Health Open Educational Resources Network.

This network was launched in 2008 and supported through 2012 by a grant from the William and Flora Hewlett Foundation. The Colleges of Health Sciences at the Kwaame Nkrumah University of Science and Technology (KNUST) and University of Ghana produced open educational resources in medicine, dentistry, and public health as part of their role with the network (Okudzeto, Lal & Sedegah, 2017; Omollo, Rahman & Yebuah, 2012).

**Methodology**

This methodology is consistent throughout the three studies in the series. Much of the methodology description below is excerpted from the previous paper on Kenya. The excerpts are indicated by italics. The text that is not in italics is paraphrased.

*These are the research questions (RQs):*

1. **What is the state of connectivity and digital proficiency among lecturers and students in Ghana?**
2. **What kind and level of use, re-use, creation, and sharing of educational resources (ER) is common among lecturers and students (but for the latter not including re-use and creation) in Ghana?**
3. **What is the level of awareness of licensing related to open educational resources (OER) among lecturers and students in Ghana?**

4. **How do lecturers and students perceive the value of openness in educational resources (ER), its implementation opportunities, and its institutional context (the latter item only for the lecturers) in Ghana?**

   *Note that RQ1 relates to digital differentiation, RQ2 to ER differentiation, and RQ3 and RQ4 to OER differentiation.*

Surveys were distributed through email in coordination with university ICT departments. Survey responses were gathered from Month 1–Month 2, 2017.

In the first paper, we elaborated on the important observation that generally neither students nor lecturers are very knowledgeable or understanding of the OER concept. This appeared in a pilot from inconsistencies in responses as well as from questionable answers. We concluded that respondents had not really internalized the OER concept (in particular the associated open licensing approach), and we called this phenomenon the ‘perception eclipse’, which unintentionally would lead to at least partly invalid results. We therefore changed the reference from OER to ER in the questions related to this failure. The set of RQs presented above is the result of this exercise. Many survey studies unintentionally can be bothered by this perception eclipse, in particular in cases with concepts that are difficult to grasp or distinguish, such as OER. With our methodological measures we try to limit the perception eclipse as much as possible.

The lecturers’ questionnaire includes 30 items, the students’ version 26 [items]. Both questionnaires contain 4 items on RQ1 and 2 items on RQ3. For RQ2 the lecturers’ version addresses 5 items, the students’ version 3. And, RQ4 is being covered by 7 items (for the lecturers), and by 6 items (for the students). The remaining items (12, respectively 11) are either demographic or not relevant for this study. The items in the questionnaires offer multiple-choice answers from which the respondents should tick the relevant ones. Some of the questions can have more than one answer (Pete, Mulder & Oliveira Neto, 2017).

The research has an exploratory character and is wholly based on the quantitative descriptive data provided by the two questionnaires. There is no qualitative part such as additional in-depth interviews of representatives of the two populations studied. The sampled lecturers and students were invited to fill in the questionnaires available on SurveyMonkey. Some used the online SurveyMonkey, but the majority used the printed version of the questionnaires, which were later keyed into the SurveyMonkey by the local coordinators at the participating universities. Respondents were offered incentives in the form of flash disks.

We have collected data from four universities in Ghana, which represent two types of universities: those that provide comprehensive studies and those that are technical or technology-focused. In order to incorporate further diversity we have included one private university versus three public universities. The universities selected were:

- University of Ghana / UG *(public, comprehensive)*
- University of Cape Coast / UCC *(public, comprehensive)*
- Kwame Nkrumah University of Science and Technology / KNUST *(public, technical)*
- Catholic Institute of Business and Technology / CIBT *(private, technical).*

The random sampling of the lecturers and students was done on the basis of the courses delivered in those four universities in a chosen semester. Out of the full list for each university 30 courses were randomized. From each set of 30, the local university coordinators were asked to identify at least
10 courses with more than 30 enrolled students and with lecturers who were willing to support the data collection.

The target was to get responses from a minimum of 200 students and 10 lecturers from each of the four universities. In the end, we generated a sample of 818 students (405 at technical universities and 413 at comprehensive universities) and 38 lecturers (20 at technical and 18 at comprehensive universities). In the sample, the median age of the lecturers is 42.5, with a range of 27 - 68 years old. For the students, the median age in the sample is 25 with a range of 18 - 39 years old. With regards to gender, majority of the respondents were male. For lecturers, the sample was 81% male versus 19% female, while for students the sample was 57% male versus 43% female. For educational qualifications, 39% of lecturers have a PhD as their highest degree, 41% had Masters degree as their highest, and 19% had a Bachelors degree as their highest. The majority of the lecturers had been teaching in their respective universities for less than five years as lecturers, senior lecturers, assistant lecturers, or researchers. A very small percentage (approximately 4%) worked as administrators and consultants. The lecturers came from diverse disciplines, including applied science and technology, economics and business studies, history and geography, social sciences, religious studies, and education. The disciplines represented by students in the sample included applied science and technology, religious studies, education, and social sciences.

Results and findings

In our reporting here we limit the discussion to a selection of the most relevant outcomes of the two questionnaires. In the first paper in the series on Kenya, we focused on differences between universities in rural and urban areas. In this paper for Ghana, we focus the discussion on differences that emerged between technical and comprehensive universities. The results and findings are presented under the headings of the four research questions.

**RQ1: What is the state of connectivity and digital proficiency among lecturers and students in Ghana?**

Since the use of (O)ER presupposes certain proficiency in the use of computers, the participants’ digital proficiency is an important item in the questionnaires. Figures 1 and 2 (lecturers) and 3 and 4 (students) show how the respondents at technical and comprehensive universities self-assess their digital proficiency. The ‘advanced’ share is larger at comprehensive than at technical universities:
22% versus 15% (lecturers) and 12% versus 5% (students). However, the ‘intermediate’ share is larger at technical than at comprehensive universities: 80% versus 61% (lecturers) and 68% versus 52% (students). When it comes to the ‘basic’ share, there is a reversal, with a higher percentage of basic competence at comprehensive universities as compared to technical universities: 17% versus 5% (lecturers) and 36% versus 27% (students).

Though the advanced share is higher at comprehensive universities, the overall technical competence (‘advanced’ plus ‘intermediate’) is rated higher at the technical universities with 95% of lecturers and 73% of students as compared to 73% of lecturers and 64% of students at comprehensive universities. The difference in the advanced share may be explained by the idea that lecturers and students at the technical institutions are more aware of the ICT industry broadly and may be self-critical in terms of how advanced their own digital competence is relative to the industry. Alternatively, it may reflect a difference in actual competence.

From Figures 1-4, we can conclude that the lecturers at both comprehensive and technical universities rate themselves more digitally proficient than their students, which is what one would prefer in the context of knowledge transfer for digital skills from lecturers to students. There is certainly room for improvement, however, observing that only 22% (comprehensive) and 15% (technical) of lecturers see themselves at the ‘advanced’ level of digital expertise.

With respect to digital literacy among lecturers Grimus and Ebner (2014) confirm the low prevalence in a similar study in Ghana. They noted that few instructors used the world wide web for preparation of their lessons and less than a third were familiar with basic internet skills.

Let us now move to Figures 5 and 6 regarding the location of internet access. The sample reveals that students and lecturers have different behaviors in terms of the locations where they access the internet. This was a multiple response question, where respondents were asked to select all that apply. For lecturers the most frequent way to access Internet is outside of their workplaces: around 42% of the lecturers access Internet at wi-fi hotspots, Internet cafés, and/or at shopping malls. This is in contrast to the students, where roughly 30% access internet at school, university or workplace. For lecturers, the least common method of access is public libraries. For students, the least frequent is family member’s or friend’s home.

This finding reveals higher than expected internet access from home for both students and lecturers. Previous sources on internet usage and locations found that, about 2.7% of households in Ghana had a working internet connection with 19.7% using internet overall (Stork, Calandro &
When asked about where they used the internet in the last 12 months, 61% of respondents said they used mobile phones, 35% said they used it at work, 51% said they used it at a place of education, while 58% said they used it at internet cafes. Similarly, though Ghana was one of the first countries to be connected to the underwater cables for the internet, internet usage across population grew slowly. A 2011 source estimated 5.3 users per 100 inhabitants (Fosu, 2011).

Regarding the devices used to access the internet, Figures 7 and 8 show similar patterns for students and lecturers. This was another multiple-response-select-all question. For the lecturers the ranking from most frequent to least is laptop computers, mobile phones, desktop computers,
and tablets respectively. For the students, the pattern is the same although the proportions vary. This finding of mobile phones as a substantial method of access on par with that of laptops is consistent with other studies.

A 2015 study touted “mobile phones were the most used device to access the web all the time in Ghana” (Frimpong & Vaccari, 2015). Though laptops were more frequently used than phones in our sample, the slight edge of laptops may simply be because those respondents have multiple device options and computer ownership is believed to be higher among lecturers and students than in the general population. A 2010 study of medical students at KNUST and UG found that 67% of those at KNUST and 89% at UG owned their own personal computer and an additional 24% at KNUST and 5% at UG shared a computer with another student (Adanu et al., 2010).

The high (number 2) ranking for the usage of mobile phones in our study suggests opportunities to integrate mobile phones into innovative teaching and learning approaches. Grimus, Ebner and Holzinger (2012), connote that, “while computer-labs and desktop-computers are scarce in schools in developing countries, mobile networks, mobile phones and now smart-phones have the potential to question new approaches to learning and teaching”. Teachers and students are starting to take advantage of the opportunities of mobile phones for learning (Grimus & Ebner, 2014).

A report by Meeker and Wu (2013) stated that 75% of web users used mobile phones compared with 71% using desktop computers. Grimus and Ebner (2014) propose that mobile penetration compensates for the lack of fixed ICT infrastructure and offers the chance to provide on- and off-line content for learning and knowledge-creation via mobile devices.

Our findings in Ghana show a fruitful ground for an extension of mobile learning at universities, while also noting that it would require a major shift in thinking and attitudes among both lecturers and students. The government is in a position to further stimulate this promising development with specific policies and incentives.

The last topic addressed under this research question is the level of satisfaction that students and lecturers at technical and comprehensive universities express to have with the internet connection where they most frequently access it. This relates to three aspects: cost, speed, and stability. Respondents could only select one option in each of the three categories. In Figures 9 and 10 we see very diverse pictures where we compare ‘technical’ with ‘comprehensive’. For both students and lecturers, the dissatisfaction at the technical universities is very pronounced (for all three: cost, speed
and stability) while at the comprehensive universities the overall satisfaction is positive. There is a substantial digital divide or differentiation between technical and comprehensive universities in terms of internet access and accessibility. Whereas most of the lecturers at technical universities are very dissatisfied, some of their counterparts at comprehensive universities are ‘unsure’ of their levels of satisfaction.

Gyamfi and Gyaase (2014) affirms the difficulties related to internet access and slow speed of connectivity within and outside the learning environment, which poses a challenge to implementing blended learning in higher learning institutions in Ghana. The current weak internet connection hinders innovations in teaching and learning.

**RQ2: What kind and level of use, re-use, creation, and sharing of educational resources (ER) is common among lecturers / students in Ghana?**

Here we consider the processing behaviour of both lecturers and students with respect to different categories of educational resources.
Figures 11 and 12 show interesting patterns for the lecturers and the students in their processing of four ER categories:

(a) Office documents (like Word, Powerpoint, Excel) and PDF
(b) Images, audio, video
(c) e-Books, lecture notes, quizzes, tutorials
(d) Textbooks, whole courses, massive open online courses (MOOCs), data sets

This was another multiple-response-select-all question.

In the spectrum of five different modes of processing, the three in the middle are the most relevant for this paper, representing respectively the ‘use’ (mode 2), ‘re-use’ (mode 3), and ‘sharing’ (mode 4) of ER. In their responses, both lecturers and students show an attitude and behaviour of embracing...
key attributes of openness in educational resources. A measure for this can be found in the sum of the scores for modes 2, 3, and 4, averaged over the four ER categories, which amounts to:

- for the lecturers: 51% as compared to 38% for mode 1 (‘create’) and 11% for mode 5 (‘never created or used’)
- for the students: 54% as compared to 26% for mode 1 (‘create’) and 20% for mode 5 (‘never created or used’).

These results are similar to the outcomes of the Kenya study and both countries exhibit a preparedness for openness. This may apply merely on pragmatic grounds and without a solid understanding of the OER concept as we have pointed out earlier in this paper. But it could also comprehend a promise towards real appreciation of what OER and open licensing can offer.

Next, in Figure 13 we show the lecturers’ responses about types sources they would feel free to use resources for their teaching. This was another multiple-response-select-all question.

At first glance, this picture seems to present overall relatively responsible lecturers in terms of copyright considerations: ‘fair use’ (22%), ‘acknowledgement’ (16%), and ‘open licensing’ (16%), which sums to 54%. In the Kenya study, we found a similar sum (59%). In both countries, however, we see a large share (46% in Ghana, and 41% in Kenya) for an unregulated, blurry area. Moreover, we can have serious doubt on the validity of the high scores on the right hand side of Figure 13, realizing the lack of knowledge and understanding of the option of ‘open licensing’ which actually also might apply to the other two options. It seems that most of the lecturers take great liberty in their use of others’ ER.

Table 1 shows the top 5 out of 13 possible options of activities that lecturers say to undertake if they use educational resources from others. This was a multiple-response-select-all question. Here, we see a broad variety of use. Again, it shows that the lecturer’s operational behavior is parallels the open philosophy.

Similarly, in Table 2 the top 5 out of 11 possible options is presented for activities that students say to undertake when using educational resources created by others. The sample reveals differences in behavior between students from technical and from comprehensive universities. The most frequent activity differs between the two. For students at comprehensive universities, it is summarizing the
essential ideas, whereas for their technical counterparts it is integrating the content with other content (which is ranked 4 for the comprehensive students). Note that almost all lecturer’s top-5 activities from Table 1 return in the list of activities for the students in Tables 2 and 3, albeit not necessarily in the same positions.

**RQ3: What is the level of awareness of licensing related to open educational resources (OER) among lecturers and students in Ghana?**

In Figures 14 and 15 responses have been collected to the question whether lecturers, respectively students have used any licenses to express the rights others have to use the materials they have processed (created, edited, modified, or combined). The dominant option in both figures is that no license is assigned: 57.5% for the lecturers, and 81.3% for the students. Traditional copyright

| Table 1: Lecturer’s activities undertaken when using educational resources created by others |
| Use of ER: lecturer’s activities (top-5 in percentages) |
| Change the content or add locally relevant information, examples and scenarios | 19% |
| Integrate the content with other content in order to develop a module or new unit | 19% |
| Transform the content by adding an interpretation, reflection or practice | 16% |
| Summarize the essential ideas | 16% |
| Combine the content with new media | 7% |

| Table 2: Student’s activities undertaken when using educational resources from others - Technical |
| Technical University |
| Integrate the content with other content in order to develop a module or new unit | 19% |
| Transform the content by adding an interpretation, reflection or practice | 15% |
| Copy the content and use it unaltered | 13% |
| Change the content or add locally relevant information, examples and scenarios | 13% |
| Summarize the essential ideas | 12% |

| Table 3: Student’s activities undertaken when using educational resources from others - Comprehensive |
| Use of ER: student’s activities (top-5 in percentages) |
| Comprehensive University |
| Summarize the essential ideas | 20% |
| Change the content or add locally relevant information, examples and scenarios | 14% |
| Transform the content by adding an interpretation, reflection or practice | 13% |
| Integrate the content with other content in order to develop a module or new unit | 8% |
| Combine the content with new media | 8% |
assignment scores 32.5% (lecturers) and 16% (students), and various open licensing schemes rate in total 10% (lecturers) and 2.7% (students).

The pattern of behaviour in the two figures clearly shows that both the lecturers and students are not really aware of the licensing in use for ER. According to a survey by McAndrew (2010) on redefining “openness”, it was noted that awareness of licensing remains low and few academics engaged in other methods of teaching seek out materials on the basis that they are OER.

The response to the reverse question, whether lecturers and students themselves have ever used OER that are available in the public domain or have an open license, shows a fair share with ‘Yes’, but yet about 52% of both lecturers and students responded with ‘No’ or ‘Don’t know’. We conclude that overall the awareness and appreciation of open licensing, let alone commitment to this approach, is low. However, it is not absent either, which may provide a fruitful basis to further embrace the open licensing policy.

**RQ4: How do lecturers and students perceive the value of openness in educational resources, its implementation opportunities, and its institutional context?**

In this research question, we are addressing the OER concept per se, giving the response the deserved treatment but at the same time being cautious and in some cases even reserved in our conclusions when the results are raising doubts. One cause for this could be the perception eclipse that easily may have interfered with the response in this ‘getting-to-OER’ part of the survey. Another reason could be fatigue with the respondents when filling out the final questions in the long questionnaire.

We start in Table 3 with the top 4 out of 6 options of identified potential motivators for the use and reuse of ER which actually might be considered to represent a stimulating gate to convert to OER. Lecturers and students had the same top 4, but with different ratings, which is why it has been consolidated into a table for both groups.

The table shows an even picture with all four motivators rated close to ‘very important’ (5.2-4.7) by the lecturers and 4.8-4.0 by the students. The other two motivators, regarding ‘normal practice’ and ‘reputation’ (not shown), score lower.

Table 6 presents the top 6 out of 12 options of potential barriers for the use and reuse of ER. Lecturers and students had the same top 4, but with different ratings. Where the ER motivators can be viewed as stimuli for a conversion to OER, the ER barriers likewise can be inhibitors in a development process towards OER in Ghana.
This table shows substantially lower scores as compared to Table 3. Almost all barriers are expressed in terms of ‘lack of …’, except for ‘quality worries’, and the two lowest scoring barriers: ‘no reward system’ and ‘no compensation’ (at 2.8, not shown).

Table 7 summarizes the top 5 out of 10 statements about OER as applied to their educational institution for which the lecturers indicate their level of agreement.
The highest scored response in Table 7 has a score of 4.0, and even the bottom-5 (referring to ‘instructors attitudes’, ‘diversity’, ‘support services’, ‘quality assurance’, ‘credentialing’) have scores of 3.0. We see overall positive ratings among all 10 options. This shows a relatively positive and optimistic picture among its lecturers, which may be unrealistic. We have no firm explanation for this relatively positive picture among the lecturers, but, again, it could be due to the perception eclipse or fatigue with the respondents, or even an expression of loyalty with their educational institution.

Final reflections, conclusions, and recommendations

Ghana is one of the countries in Sub-Saharan Africa that first embraced global developments with regards to online learning through the adoption of two national ICT in education policies, in 2008 and 2015. Ghana has been very active in a number of open, distance and e-Learning consortia and projects, including African Virtual University and the African Health Open Educational Resources Network. For a decade Ghana has pursued a vision of becoming a tech leader for West Africa and beyond. It has currently embraced 16 digital innovation hubs, which is an indication of promoting online and open learning as key in expanding access to and quality of education.

By spending more than 6.2% of its GDP in education, Ghana views education as a crucial driver for social, political and economic development. There are also promising initiatives to create a better ICT environment and infrastructure as seen in its National Education Strategic Plan of 2010-2020, which calls for the expansion of ICT for instruction at all educational levels.

However, gaps in access to ICT and to higher education exists and there is significant digital differentiation, as demonstrated the findings from sample that included lecturers and students at public and private comprehensive universities and technical universities. Our major conclusions and recommendations include:

1. There is a significant digital proficiency differentiation between lecturers and students at technical and comprehensive universities in Ghana, irrespective of the adoption of national ICT in education policies in 2008 and 2015; as well as setting up a national education strategic plan for 2010-2020. This therefore calls for a boost from the government and other stakeholders.

2. There is substantial digital differentiation in terms of internet accessibility and the extremely low level of satisfaction with the internet connection at the technical universities as compared to the comprehensive universities. This poses a serious challenge to realizing the national education strategic plan for 2010-2020.

3. Overall awareness and appreciation of open licensing is low and therefore a hindrance in the adoption of the OER philosophy and especially the 2008 and 2015 Ghanaian ICT Policies.

4. The decision to change reference from OER to ER in collecting data on the actual processing and behaviour of respondents with respect to different ER categories rather than gathering their perceptions of the value of openness in ER, has worked out well. We call upon the OER research community to be equally specific and cautious with respect to the outcomes of similar empirical OER studies, in particular when a perception eclipse may exist.

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Designing Online Curriculum: 
Program Revisions and Knowledge Exchange

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Abstract
In this article, I focus on the importance of knowledge exchange and knowledge communities to create an online curriculum that moves from individual course design to shared curriculum design. I draw from current discussions on communities of practice, agoras, and knowledge societies, expanding on the notion that knowledge, in order to benefit society, has to be shared. I show the results of a program redesign at Northern Arizona University achieved through collaboration on online course learning outcomes as well as course design, and I conclude by arguing for continued assessment of current practices to encourage educators to think critically about their contributions to an open knowledge society.

Keywords: curriculum redesign, online graduate program, knowledge communities, open knowledge exchange, faculty collaboration, student learning

Introduction
Faculty at my institution share knowledge—formally and informally—on an ongoing basis. We talk in hallways, in our offices, and in department meetings. We publish articles on subject-specific issues. We go to conferences and discuss new developments in our fields of expertise. We are happy to receive feedback that will push our research in a new direction. However, when it comes to course redesign and curriculum revisions, we often consider requests for changes to an established syllabus as threatening our authority, and with it academic freedom. Mimeographed course syllabi, with only the semester and year changed, were part of the academic culture before computer technology made it easier to quickly update to a new semester. But despite the increased ease of making necessary changes, the substance of many courses often remains unchanged for many years. Participating in an open exchange of knowledge, although valued and promoted for research purposes and for discussing overall pedagogical approaches in the classroom, often stops before it impacts course and program redesign.

This approach to curricular discussions is not unusual. As Linda Darling-Hammond and Bransford (2005) point out in their research on teacher education programs, many programs offer “fragmented and incoherent courses,” and they also lack “in a clear, shared conception of teaching among faculty” (p. 391). The online Master’s program discussed in this paper faced the same issues. It did not provide students with critical knowledge that was reinforced throughout the program and that could be applied to their respective work situations and shared with their colleagues. As faculty, we were trained in specific subject areas; our dissertations and our continuous research provided us with expertise that we wanted to share with our students. However, we were not trained in providing students with an integrated curriculum that would lead them from introductory knowledge to in-depth knowledge, and that would ensure that the knowledge they acquired could be applied and could be shared beyond the classroom.
To address opportunities for collaboration among diverse stakeholders, I focus on how the concepts of knowledge exchange and knowledge communities encouraged faculty, students, and administrators in the newly revised online graduate program in Rhetoric, Writing, and Digital Media Studies at Northern Arizona University to create a curriculum that moves from individual course design to shared curriculum design. I draw from current discussions on communities of practice, agoras, and knowledge societies addressed by Lave and Wenger (1991), Wenger (1998a, 1998b), Drucker (1994, 2011), Echeverría (2010), Hughes, Jewson and Unwin (2013), Peter and Deimann (2013), and Rifkin (2014a, 2014b), and I expand on the notion that knowledge needs to move from being abstract and individual towards becoming a common good that is shared in order to benefit society. The curriculum redesign results are based on a mixed methods participatory research approach, with participants collaborating on course learning outcomes as well as course redesign. I conclude by arguing for continued assessment of current practices to encourage educators to think critically about their contributions to an open knowledge society.

**Collaborative Commons, Knowledge Communities, and Knowledge Societies, Or: What Do We Know About Working Together Productively**

Terms such as open access, open source, open education, and open research have been prominently featured in academic and public literature. Jeremy Rifkin (2014a), an economic and social theorist, told his readers that the “capitalist era is passing…not quickly, but inevitably. A new economic paradigm – the Collaborative Commons – is rising in its wake that will transform our way of life.” (p. 1) This paradigm shift, he continues, is possible because “economic paradigms are just human constructs, not natural phenomena.” (p. 2) Similarly, Peter Suber (2012) pointed out that open access has become a driving force in the academic publishing community because “any digital content can be put online without price or permission barriers” (p. 4). The Gates Foundation (2018) includes benefits for researchers, research, and society in their definition of open research, arguing that open research “reduces the barrier to collaborative research through data sharing, transparency and attribution” (Gates Foundation). Using this approach, information becomes available to users as part of a knowledge commons, increasing access to information that can be shared and used to create new knowledge by promoting discussion, interaction, and analysis on a local, national, and international level. However, academic institutions and publishing houses do not share a centralized structure for rewarding open and transparent research (Nosek et al., 2015). Additionally, Deimann (2014) in his critique on open education points out the oversimplification of the concept of transparency and equal access. Deiman uses Walsh’s (2011) research to point out that MIT’s open courses retain their exclusivity by not providing university credit to non-matriculated students. (p. 99) Deiman sees large MOOCs as a catalyst for “commercialization and commodification” (p. 105) that have led to continuous debates about “accreditation, certification and quality control” (p. 109), undermining definitions of “open” and encouraging academics and researchers to reconsider “claims of Open Education.” (p. 110) Similarly, Masterman (2016), in her study of Open Educational Resources (OER) at the University of Oxford, concludes that institutions’ initiatives rely on principles of governance. Institutions, she points out, need to encourage the integration of OER in the academic reward structure to support “open resources and open approaches to pedagogy” (p. 40).

The complex issues surrounding open educational practices and the sharing of knowledge are magnified by increased connectivity, or what Rifkin (2014b) calls a “formidable new technology infrastructure.” (Rifkin, 2014b) We can share knowledge in digital spaces, and we can create open access venues through Web 2.0 technologies. However, such access increases the complexity of OER even more since, as Rifkin points out, we need to learn “how to live together in an increasingly
interdependent, collaborative, global commons.” (Rifkin, 2014b) To make collaborative commons work, Rifkin emphasizes the importance of effective management strategies, including clearly defined boundaries, rules that are established by commons members, consequences for undermining the rules, and recognition of the commons by outside authorities (2014a, p. 162). In other words, without institutional support structures, effective ways of managing the distribution and adaptation of knowledge by the members of the community, and outreach to members outside the community, increased accessibility cannot be achieved.

Rifkin’s comments are a reminder that shared knowledge involves organizational structures that encourage the exchange of ideas, and that promote collaboration among its members. Such communities, also referred to as “communities of practice,” (Lave & Wenger, 1991; Wenger 1998a, 1998b) or “knowledge communities,” (Echeverría, 2010) legitimize and highlight the importance of forming relationships that can be sustained over periods of time and that can lead to new and otherwise elusive knowledge. Participation in communities of practice, explained in more detail by Wenger (1998a), “refers not just to local events of engagement in certain activities with certain people, but to a more encompassing process of being active participants in the practices of social communities and constructing identities in relation to these communities” (p. 4). Knowledge distribution and adaptation within communities of practice, then, rely on the willingness of its members to contribute and redistribute information that can be used and adapted by the larger group.

Javier Echeverría, in his 2010 article on “Epistemopolis: From Knowledge Communities to Knowledge Cities,” continues the discussion on knowledge communities and includes the concept of knowledge cities, arguing that knowledge communities promote “specific kinds of knowledge” (p. 24) but do not necessarily share this knowledge in the agora – the space that allows for public distribution of knowledge. Knowledge sharing, he points out, needs to be organized in an “epistemopolis,” or “knowledge city” where “different types of knowledge can be expressed freely and accessed by any citizen.” (p. 24) This implies that it isn’t simply enough to promote distinct knowledge communities; instead, it is necessary to provide “complex forms of association that develop on a foundation of a plurality of shared knowledge among different communities, and that maintain public spaces for the free exchange of knowledge.” (p. 23) This free exchange assumes that knowledge is not only consumed, but that it is produced, shared, assessed, and reconstituted by participants in the larger agora, leading from small communities to a larger knowledge society. This, according to the Gates Foundation (2018) and the UNESCO World Report (2005), is essential because otherwise, “knowledge societies will not really be worthy of the name unless the greatest possible number of individuals can become knowledge producers rather than mere consumers of already available knowledge.” (UNESCO, p. 189)

The principles of communities of practice and knowledge communities guided our attempts to revise the online Master’s program in Rhetoric, Writing, and Digital Media Studies. We realized that a strong and cohesive program relied on individual and local knowledge that could be shared and that could contribute to building a knowledge community. This knowledge community could then become part of a broader knowledge society that operates on the concept of the open agora where students contribute to and participate with communities outside their closely focused classroom and workplace communities.

**Surveys, Interviews, and Collaboration: Learning from Stakeholders**

Curriculum redesign at my institution takes place periodically, often seen as an imposition and undertaken to fulfill accreditation requirements. We performed a quick update and name change 15 years ago when we started to offer a master’s program in rhetoric, composition, and professional
writing fully online. At that time, the program encouraged students to choose any 36-hour combination of rhetoric, composition, and professional writing courses to satisfy degree requirements. We were closely aligned with similar degrees outlined by Stuart Brown, Rebecca Jackson and Theresa Enos (2000) where “the vast majority of programs require a course in the history of rhetoric, rhetorical theory (classical to modern), theories of composition, and the teaching of composition (or writing)” (p. 238).

We fulfilled all the requirements for a mainstream program in rhetoric; however, we realized that we had not taken the local context into consideration. Our teacher students were not happy with the professional writing courses, and professional writing students did not care about the classroom focus in our rhetoric and composition courses. We split the programs five years after going fully online, allowing for much flexibility and elective credits to accommodate everybody’s needs. The course offerings stayed the same, since we assumed that student dissatisfaction would stop once we divided the programs. We agreed to these changes not because we conducted actual surveys with our students or because we believed in a separation of the disciplines, but because we had heard informally from enough students that it seemed the best approach at the time for the student population we served.

Seven years later, faculty members in the rhetoric program embraced the much-needed in-depth curriculum revisions to address continued student feedback on offering courses that would be directly applicable to their current work situations. The following question guided our research and the revisions to the rhetoric program:

- What programmatic changes to the online M.A. rhetoric program are necessary to incorporate open learning principles and to promote student participation in knowledge societies?

The results of the small-scale investigation are based on a mixed methods participatory research approach. Surveys and interviews with former and current students, collaboration with assessment specialists, and open knowledge exchange with faculty participants provided the foundation for developing an open learning environment where students are encouraged to learn through collaboration to prepare them “for employment in a knowledge society” (Masterman, 2016, p. 34). To provide guidelines for discussions on course learning outcomes and course redesign, we followed Wenger’s stages of development in communities of practice:

Wenger’s model encouraged curriculum redesign stakeholders to come together and to discover common ground despite diverse approaches to teaching and learning, negotiate community and possible collaborations, engage with each other and create a new curriculum, and continuously communicate and seek advice on additional course revisions after the majority of the curriculum redesign was concluded (see Figure 1).

**Open Knowledge Exchange to Improve Current Practices: Discussing the Challenge**

**Surveys and Interviews as Catalysts for Change**

We conducted surveys with past and current students, we interviewed students and colleagues in rhetoric and writing studies, and we explored online graduate programs in the field. From our surveys, we learned that our student population for the graduate program in Rhetoric consists of 80% middle school, high school, and community college teachers who wanted to update their skills and move up within the institutional ranks or move to another educational institution. 15% of our students were in the process of changing their careers or were newly graduated bachelor’s students interested in going into the teaching profession, and 5% were military personnel who were involved with teaching
writing at the base. Student ages ranged from 22–70, with the majority of students in their thirties to their fifties. For many of the students it was the first time back in the college classroom after a 10–30 year professional career, and the first time enrolled in an online program. Because students were not place-bound, they could enroll in the program from any location nationally or internationally. This meant that the needs of our approximately 100 enrolled students were diverse. Some of the teachers, for example, worked exclusively with underrepresented students while others were in a high-achieving school district. Some worked with ESL learners in the U.S. or abroad. Some worked in districts that had limited to no access to technology. All, however, wanted to serve their specific student populations better and wanted to learn how to do so by completing the master’s program. In addition, close to 40 % were interested in continuing to a PhD program at some time in their lives.

In the follow-up interviews, we asked students what topics they would like to see in the program. They emphasized the importance of exposure to writing in other disciplines in addition to the more traditional course topics such as writing pedagogy/composition theory courses, rhetorical theory courses, and social media writing courses. Students wanted to use what they learned in their courses and apply it to their work situations, and they wanted to see a bridge between theory and practice. In addition, they wanted to be able to present at conferences in their school districts, locally, or on a national level. As one student pointed out, “The writing assignments I have most appreciated are ones that I could potentially present at a graduate conference or submit for publication in a journal.” Student goals in our program where similar to the goals outlined by Miller Brueggemann, Blue and Shepherd’s (1997) survey, especially highlighting professionalization and preparation for the job market (p. 394).

When we initially discussed the survey and interview results, we were pleased to see that many of the current students seemed satisfied with what we offered. If we focused on the overwhelming positive feedback we received, especially in terms of faculty commitment to student success and dedication to creating a positive online environment, we could ignore some of the problems that students pointed out to us. For example, we learned that our courses were “uneven” with some
faculty requiring few readings and few responses, and others focusing on more reading than students could critically analyze and discuss. We overemphasized some course topics and barely addressed others, including interdisciplinary writing in middle and high school settings. The assignments we asked our students to complete did not build on each other, and students, even though they took a capstone course, were unsure what the expectations were for their final work in the program. Many did not understand what it meant to apply theory to practice, and they muddled through their final work without applying the information and skills they acquired throughout the program.

Before we conducted the survey and interviews, we understood our roles in terms of providing excellent course content to our students. We kept current in our fields, updated our courses when necessary, and received good individual student comments. From conference presentations and readings in the field, we knew that what we taught was also taught in other rhetoric programs. Similar to the programs discussed in Peirce and Enos’s (2006) article on graduate curricula in rhetoric and composition, our program focused on composition theory and history of rhetoric, with argumentation, basic writing, and literacy studies included in the mix. However, up until this point, we didn’t engage with each other on course design although we would exchange information on what we did. The information from the survey and interviews were the beginning part of moving from individual efforts to a more sustainable open knowledge exchange. At first, we resisted sharing course-specific details with our colleagues. We thought that we could implement the necessary changes—new learning outcomes that we could all agree on—without going deeply into individual course design. We had the technical knowledge that allowed us to conduct the surveys and do research on other programs, but we hadn’t yet come to an understanding of shared responsibilities and shared knowledge. Even though we wanted to agree that “knowledge is nonrivalrous,” (Suber, 2012, p. 46) we also wanted to protect our right to our own subject specializations, our course design, and our grading. Since our department does not encourage or promote classroom visits, we were largely unaware of each others’ course design, operating on the principle of “Lehrfreiheit,” which, introduced in the 19th century from Germany, refers to “the right of the university professor to freedom of inquiry and to freedom of teaching, the right to study and to report on his findings in an atmosphere of consent.” (Rudolph, 1962, p. 412) This freedom, to us, was part of our professional persona, and giving up this freedom by sharing course design with our colleagues was—and still is—difficult to consent to.

Since our surveys and follow-up interviews showed that students were interested in course topics and assignments that would directly apply to their work situations, we realized that keeping a close watch on individual courses would not allow us to make the needed changes to the curriculum. Once we accepted that individual strengths could be improved through collaboration, we started to work as a “knowledge community,” moving from providing information and data to working together on interpreting and using the data to arrive at a more integrative program. This approach was closely aligned to Peter Drucker’s (2011) argument that “only when a [person] applies the information to doing something does it become knowledge.” (p. 269) This led us to reconsider Suber’s explanation of why knowledge should be openly accessible, even though it can be hard to let go of our individual course designs. As Suber (2012) pointed out, “we can share it without dividing it and consume it without diminishing it. My possession and use of some knowledge doesn’t exclude your possession and use of the same knowledge.” (p. 46) We finally put into practice the theoretical principles of knowledge communities that we often discussed in our interactions with each other and that we addressed in some of our courses but that we never fully applied to our own group interactions. Similar to Lave and Wenger’s (1991) communities of practice, we started to accept that we could arrive at common goals and common knowledge that exceeded and improved individual knowledge. With this, we learned to renegotiate individual goals in order to participate as members of a community engaged in creating shared goals for the program.
Curriculum Discussions and Implementation as Shared Knowledge

To create a supportive environment where knowledge could be openly shared and discussed, we established an organizational structure that was influenced by Rifkin’s (2014a) discussion of management strategies for knowledge commons. We understood the need for clearly defined boundaries (p. 162) and established a focus on the graduate curriculum in rhetoric, with students and faculty from the rhetoric group discussing the specifics of the changes, and assessment specialists providing valuable feedback on how to create a sustainable and learner-centered curriculum. We worked towards common knowledge in a supportive and non-judgmental environment, and also followed Rifkin’s (2014b, p. 162) argument that members of the group had equal input on what learning outcomes would be included in each course, what assignments in a specific course would provide the stepping stone for future coursework, what seminal readings should be included in the curriculum, and what courses needed pre-requisites. We agreed that courses, once we taught them, could be modified as long as the newly established learning outcomes were met, and as long as the changes didn’t undermine the curriculum goals we established. In our discussions, we also agreed that specific reading requirements beyond initially agreed-upon seminal works in the field would be determined by the specific faculty members teaching the course. This provided academic freedom within a structure that took into account both student need for specific topics and faculty need for creating a syllabus that supported their strengths while also including agreed-upon course assignments and learning outcomes.

Because we established boundaries and rules, the often long-drawn-out process associated with serious curriculum revisions became a shared activity for students, assessment specialists, and rhetoric faculty. We used the information we collected from our students and from colleagues in the field, and we worked with assessment specialists who were an integral part in the revision process. With their support, we were able to take individual learning outcomes from our courses as a starting point for renegotiating and revising the overall program learning outcomes. During the process, we learned that none of the courses we previously taught focused on classroom to workplace writing, and none of the course requirements included exposure to applications projects—both areas of interest for our students. Instead of a simple “Can you do it?” we included workplace writing and project-based learning throughout the curriculum, making sure that students would receive introductory guidance and practice that could be applied in later coursework to successfully complete their capstone project—a course we designed to use concepts of open learning to engage students in 21st century knowledge communities.

Stakeholders’ combined knowledge, and our willingness to share this knowledge within defined boundaries, allowed us to move towards a curriculum that benefitted from individual strengths in connection with a strong common goal for student success. Instead of taking a medley of individual courses, we now guide students through the program by providing them with introductory courses that will get them ready for special topics courses. Program learning outcomes are organized by topics, including theory and knowledge, analysis and critical thinking, and application. Once students have taken the required courses, we know that all learning outcomes are addressed through course readings, course activities, and writing assignments. We no longer need to wonder what our colleagues are teaching, and we can advise students with confidence when they ask about how a specific course will fit their program and their career goals.

Concluding and Continuing

Our work on the Rhetoric, Writing, and Digital Media Studies graduate curriculum was recognized by outside authorities—the Department of English, the College of Arts and Letters, and the Office...
of Curriculum, Learning Design, and Academic Assessment—which was an important point for legitimizing the outcome of our efforts as a community. It is in line with Rifkin's (2014a, p. 162) insistence on recognition of knowledge communities, arguing that work conducted within a knowledge group can only be carried on and sustained if it is seen as valuable by members outside the knowledge community. Wenger (1998b) also argues that “organizations can support communities of practice by recognizing the work of sustaining them; by giving members the time to participate in activities; and by creating an environment in which the value they bring is acknowledged” (Wenger, 1998b). Certainly, our work is not done. Similar to Yancey’s (2009) outlook on what comes next in the curriculum discussions at her school, we also ask: “Do we review program components annually and make incremental changes? Do we stage a retreat when the entire program is reviewed and changes are suggested? Do we do both? In each case, what data do we need? Who will be involved, and why?” (p. 11) Our attempts at revising the graduate curriculum by creating a collaborative and open knowledge community among rhetoric faculty members have encouraged us to start discussions of the undergraduate curriculum, using similar strategies to plan and carry out curriculum changes. Even though we know that our open knowledge community is limited by space and time, and is focused on exchanges of research information and curriculum design, we can create an openly accessible knowledge base that promotes student learning and success and also encourages continuous interactions about teaching strategies and about research interests. Because we were able to define knowledge as “nonrivalrous,” (Suber, 2012) it helped us increase faculty collaboration on curriculum design. Thus, we no longer discuss “my” and “your” course, but we focus on “our” curriculum and “our” learning outcomes while honoring faculty input and choices, and we continuously discuss how we can improve student experiences in our program. Similar to the findings explored by Sharla Berry (2017) on instructor practices for building community in online doctoral programs, we have learned that we need to welcome students, provide supportive feedback, create a positive learning experience, and engage our students in the learning experience. To accomplish this, we need to continue showing the importance of functioning communities of practice that encourages students to become knowledge workers in an ever-expanding knowledge society.

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