Editorial policies

Open Praxis is a peer-reviewed open access scholarly journal focusing on research and innovation in open, distance and flexible education. It is published by the International Council for Open and Distance Education—ICDE.

The aim of Open Praxis is to provide a forum for global collaboration and discussion of issues in the practice of distance and e-learning.

Open Praxis welcomes 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.

Open Praxis provides immediate open access to content on the principle that making research freely available to the public supports a greater global exchange of knowledge.

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Research articles and innovative practice articles are subject to double-blind peer review by a minimum of two Reviewers.

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# Table of Contents

**Editorial**

*Introduction to Open Praxis volume 11 issue 3*

Inés Gil-Jaurena

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**Research articles**

*Do tutors make a difference in online learning? A comparative study in two Open Online Courses*

Richard Frederick Heller, Edward Chilolo, Jonny Elliott, Brian Johnson, David Lipman, Victoria Ononeze, Justin Richards

*Community of Inquiry in Web Conferencing: Relationships between Cognitive Presence and Academic Achievements*

Ünal Çakiroğlu

*Correlation between familial roles and persistence of female students on distance education programmes in Ghana: Through the lens of an administrator*

Beatrice Asante Somuah, Samson Ikinya Kariuki, Florence Muthoni Itegi

*Student Perceptions of Open Pedagogy: An Exploratory Study*


*OER Mainstreaming in Cameroon: Perceptions and Barriers*

Michael N. Nkwenti, Ishan Sudeera Abeywardena

---

**Innovative practice articles**

*Innovative Arts-Based Learning Approaches adapted for Mobile Learning*

Beth Perry, Margaret Edwards

*Developing Open Practices in Teacher Education: An Example of Integrating OER and Developing Renewable Assignments*

Jennifer Van Allen, Stacy Katz

---

**Book review**

*Book Review of Responsive Open Learning Environments: Outcomes of Research from the ROLE Project*

Naomi Wahls
This third *Open Praxis* issue in 2019, the last open issue this year—the next one will be a special issue with selected papers from the Open Education Consortium Global Conference 2019—includes five research papers, two innovative practice papers and one book review. The 8 contributions cover a variety of topics and have been submitted by a total of 25 authors from 11 different countries: Australia, Tanzania, United Kingdom, New Zealand, Turkey, Ghana, Kenya, United States of America, Cameroon, Canada and Netherlands.

In the research articles section, the first paper (*Do tutors make a difference in online learning? A comparative study in two Open Online Courses*) by Richard Frederick Heller, Edward Chilolo, Jonny Elliott, Brian Johnson, David Lipman, Victoria Ononeze and Justin Richards, presents the analysis of various dimensions (students’ participation in the course forums, completion of quizzes, grades obtained, and certificates awarded) in two online courses offered by Peoples-uni, one of them tutor-led and the other one without facilitation. They only found differences in the first dimension. While cautious in interpreting the results, the authors reflect about the role of tutors and decided to focus on self-paced courses in their organization.

In the second paper (*Community of Inquiry in Web Conferencing: Relationships between Cognitive Presence and Academic Achievements*), Ünal Çakiroğlu uses the CoI framework and survey to explore the three presences in synchronous virtual meetings in a university course. The correlation study reveals the relation between cognitive presence and the final exam score. The role of the instructor in this case—differently to what was found in the previous paper—becomes more relevant.

Dealing with a different topic, the third research paper (*Correlation between familial roles and persistence of female students on distance education programmes in Ghana: Through the lens of an administrator*), by Beatrice Asante Somuah, Samson Ikinya Kariuki and Florence Muthoni Itegi, presents a correlation study that highlights the resilience of female learners that had family responsibilities, which happened to persist more in their distance education studies. The authors raise the issue to administrators, so institutions can be aware of the situation and take action towards providing student support.

The next two contributions relate to open education and open educational resources (OER).

In the first case (*Student Perceptions of Open Pedagogy: An Exploratory Study*), John Hilton III, David Wiley, Reta Chaffee, Jennifer Darrow, JoAnn Guilmett, Sarah Harper and Bryson Hilton report on a survey-based study undertaken in the USA with regards to students’ perceptions of the educational value of open pedagogies, and on the impact of these methodologies in their outcomes in the courses. They also explored the changes in the perception about the instructors, the preferences for open pedagogies in the future, and the use of open licenses. The results advocate, overall, for open pedagogies; the authors encourage further research on the impact and efficacy of open pedagogies.

The last research paper (*OER Mainstreaming in Cameroon: Perceptions and Barriers*), by Michael N. Nkwenti and Ishan Sudeera Abeywardena, presents a survey-based study that considers the Technology Acceptance Model (TAM) applied to OER. The authors report on the perceived usefulness
of OER and on the perceived ease of use of OER, along with attitudes and behavioural intention towards OER and perceived barriers to the adoption of OER by 393 pedagogic supervisors from Cameroon. The descriptive results show that the country is in an early stage in the adoption of OER and the authors make some recommendations at the policy level.

The innovative practice papers section presents two different contributions:

In the first one (Innovative Arts-Based Learning Approaches adapted for Mobile Learning), Beth Perry and Margaret Edwards present a work-in-progress where they have adapted to mobile learning four art-based instructional strategies they had previously used and tested in computer-based online learning—poetweet, photo pairing, reflective mosaic, and the six-word story. They describe and exemplify these methodologies, and advance that they are in the process of implementing and evaluating their use in mobile learning.

The second innovative practice paper (Developing Open Practices in Teacher Education: An Example of Integrating OER and Developing Renewable Assignments), by Jennifer Van Allen and Stacy Katz, reports on a collaboration between librarians and faculty in the redesign of a course to include open approaches and learners’ co-creation. They explain the stages of the redesign project and focus on the development of renewable assignments, which promote agency.

Finally, the issue includes a book review by Naomi Wahls, who has reviewed the eBook Responsive Open Learning Environments: Outcomes of Research from the ROLE Project, edited by Kroop, Mikroyannidis and Wolpers and published by Springer Open in 2015.

Special thanks from Open Praxis to the authors and reviewers who have contributed to this issue; we expect the papers will be of interest to our readers.
Do tutors make a difference in online learning? A comparative study in two Open Online Courses

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Abstract

Two free fully online courses were offered by Peoples-uni on its Open Online Courses site, both as self-paced courses available any time and as courses run over four weeks with tutor-led discussions. We tested the hypothesis that there are no measurable differences in outcomes between the two delivery methods. Similar numbers attended both versions of each course; students came from multiple countries and backgrounds. Numbers of discussion forum posts were greater in tutor-led than self-paced courses. Measured outcomes of certificates of completion, quiz completion and marks gained were very similar and not statistically significantly different between the tutor-led and the self-paced versions of either course. In light of little discernible difference in outcome between self-paced learning compared with courses including tutor-led discussions, the utility of the time cost to tutors is in question. The findings may be relevant to others designing online courses, including MOOCs.

Keywords: Open Online Courses, tutors, outcomes, student engagement, motivation, self-paced learning
Introduction

There has been an explosion in the offering of online education in recent years, accelerated by the number of Massive Open Online Courses (MOOCs) available. Peoples-uni Open Online Courses (http://ooc.peoples-uni.org) have been running since 2008 and have included those which are available at any time for self-paced learning, as well as a number which have also been offered to a timetable with tutor facilitated discussions (Heller, Zurynski, Barrett, Oaiya & Madhok, 2017). But what is the role of the tutor in the course discussions? We have had the opportunity to compare and contrast tutor-led and non tutor-led courses in the context of two Open Online Courses where courses were offered with tutor facilitation of online discussions and the same courses offered for self-paced learning without facilitated discussions.

The context

The People’s Open Access Education Initiative, Peoples-uni (http://peoples-uni.org) aims to build Public Health capacity mainly in low- to middle-income countries through online learning offered at a very low cost. In addition to its courses for academic credit towards a master’s award (Heller, Strobl & Madhok, 2019), a separate site, also using a Moodle platform, provides free Open Online Courses http://ooc.peoples-uni.org (Heller et al., 2017). While these are not intended for a massive audience, they have similarities with MOOCs in that they are free and fully online. Students enrol themselves, and in general the courses are self-paced with access to online resources, metadata to guide the students through the resources, the opportunity to post reflections on a discussion forum, and a quiz. Criteria for the award of a certificate of completion vary between courses, but all include the completion of a multiple-choice quiz (MCQ). Some of these courses are run to a timetable with expert tutor facilitation of discussions, and we report on two courses that were offered both with and without tutor facilitated discussions through the Peoples-uni Open Online Courses site.

Courses evaluated

An Exercise and Health course was launched in October 2015 and an Injury Prevention course in April 2017. They were available for self-enrolment for self-paced learning, and low key publicity was conducted through various social media outlets and previous Peoples-uni students and graduates. They joined approximately 20 other courses on the Peoples-uni Open Online Courses site http://ooc.peoples-uni.org hosted on the Moodle platform. Students enrolled themselves up to the time that the tutor-led versions started. The same two courses were copied and updated and offered for new participants over a 4-week period in November 2018. Expert tutors facilitated the online discussions, which had existed in the previous versions but without tutor involvement. Both courses aimed to explore issues in a global context.

The Exercise and Health course provided a context for a series of 18 presentations prepared by an international group of content experts, coordinated by Exercise Works! (http://exercise-works.org/). Originally developed as PowerPoint presentations, they were each converted to e-books using commercial software. They were placed in an educational context with learning objectives, metadata and other links to relevant open access resources including those from the World Health Organisation. The resources were placed in four major sections, which each also included a discussion forum for participants to reflect on pre-prepared questions made available on the course front page. A multiple choice quiz tested knowledge of a number of aspects covered in the course,
with detailed feedback, no restriction on the number of attempts, and a pass mark of 8 correct out of 10 questions. An automated certificate was awarded with the criteria of having posted to each of the four discussion forums and having a pass mark in the quiz. Other than the restricted timetable and use of tutor discussion facilitation, the only differences between the self-paced and tutor-led courses was that the presentations were updated to the 2018 versions, and a video produced by one of the tutors added to the resources. The tutors for the tutor-led version of the course were from four different countries and were all experts in the field with educational experience, and most had been involved in the preparation of the presentations on which the course was based.

The Injury Prevention course was originally developed as a course for academic credit through the Peoples-uni master’s level programme (http://peoples-uni.org) (Heller et al., 2019), developed by an international group of volunteer tutors with special interest in injury prevention and Public Health. It was converted for the Open Online Courses site, and had a similar structure to the Exercise and Health course described above. Differences were the absence of e-book presentations, rather a set of resources as links to Open Educational Resources and more extensive metadata in each of the four sections. The quiz only required a grade, rather than a pass, with one mark assigned for each of 11 questions. The certificate, in addition to a grade in the quiz, required the download of the resources in each section rather than posting to the discussion forums. Small differences between the self-paced and tutor-led courses involved the addition of one video and updating some of the links to resources. The tutors were among those who had developed the course originally, came from three countries, and each had experience as online tutors for Peoples-uni.

Each of the courses was offered free, and advertised through social media and to previous students of Peoples-uni.

We tested the hypothesis there are no measurable differences in outcomes between online courses offered with tutor facilitation of online discussions and the same courses offered for self-paced learning without facilitated discussions.

**Literature review**

There is considerable debate about whether online (face-to-screen) learning achieves the same educational outcomes as face-to-face education, with a large review concluding “... online learning has been modestly more effective, on average, than the traditional face-to-face instruction with which it has been compared” (US Department of Education, 2009). Others find no difference (Cavanaugh & Jacquemin, 2015), or dismiss these findings (Protopsaltis & Baum, 2019). However, there are a number of limitations in the methods of comparison between online and face-to-face courses (Stack, 2015) and most of the published comparisons relate to largely undergraduate, for-credit courses. Although the results offer the providers of online education some reassurance that acceptable outcomes are possible with this method of delivery, the debate is not particularly relevant to MOOCs, which are usually offered in addition to traditional university courses. There is no face-to-face alternative to MOOCs due to the large numbers, the geographical spread of the students, and the lack of academic credit –although some providers are now offering micro-credits.

It has been suggested that there are two types of MOOC, xMOOCs, more similar to traditional university courses (but without face-to-face teacher-student interactions), and cMOOCS where collectivists of teachers and learners work together and network to explore and develop content (Bates, 2014). The connectivist approach to learning, defined by Siemens (2005) underpins cMOOCS and reflects the use of technology and connection to move learning into the digital age. Most of the xMOOCs have a standard format and contain pre-recorded video lectures produced by tutors who
also facilitate online discussion forums (Zhan et al., 2015). Both xMOOCs and cMOOCs include tutor facilitation of learning.

The type of online learning we describe, in common with both forms of MOOC, fits into the self-directed learning component of adult learning theory (Manning, 2007; Knowles, 1975). Social networks formed by communities of learners formed through the formal or informal discussion forums may assist each other and contribute to learning outcomes (Grandzol & Grandzol, 2006; Fidalgo-Blanco, Sein-Echaluce, García-Peñalvo & Esteban-Escano, 2014; Sharif & Magrill, 2015). Various third-party organisations now offer structured social interaction and support for MOOC-based learning, both online and offline (Creelman & Witthaus, 2018). But the role of the tutor in the course discussions has not been explored in the context of MOOC-based learning - this is central to our paper, where we pose the question about the value of tutors in not-for-credit online education such as those offered as Open Online Courses.

The review of online learning in more traditional higher education, which we have quoted above, has suggested “Organizations providing or promoting online learning generally recommend the use of instructors or other adults as online moderators, but research support for the effects of this practice on student learning is mixed” (US Department of Education, 2009). In addition, a review of the literature relevant to higher education in the USA summarises “…surveys find that prospective and actual online students clearly demand a more interactive educational experience, which includes regular and direct contact and communication with instructors…” (Protopsaltis & Baum, 2019). An earlier review indicates “…that the quality of interpersonal interaction within a course relates positively and significantly to student grades” (Jaggars & Xu, 2013). A number of reports have suggested that participation in online forums in MOOCs does lead to improved outcomes (Coetzee, Fox, Hearst, & Hartmann, 2014; He, Ma, Zhou, & Wu, 2018). Wise and Cui (2018) found that students who contributed to forums had higher passing rates than those who did not, although among the learners who passed the course there were no differences in course grades between contributors and non-contributors to the forums. Chiu and Hew (2018) found that it was actually the viewing of the messages rather than posting contributions to the forums that increased quiz scores. Onah, Sinclair and Boyatt (2015) compared tutor supported and peer supported forums, and found higher completion rates among students who chose the tutor supported mode. However the authors found that the peer supported forums had only occasional tutor involvement, while the additional facilities offered by the tutors were poorly used. Therefore the authors suggested that the outcomes may reflect learner motivation and commitment rather than tutor involvement. The theme of student motivation is one to which we will return in the Discussion. Continuing the theme of the impact of tutor involvement, Cho and Tobias (2016) report no difference in time spent in the virtual learning environment, course satisfaction or student achievement in an undergraduate online course, between courses offered without discussions, with discussion but no tutor involvement, and discussions with tutor involvement. The authors comment on the paucity of experimental data on the effect of discussion forums on student outcome.

The literature thus seems unclear in identifying real outcome benefits of tutor facilitated discussions, and lacking in experimental data comparing outcomes between online learning courses which offer tutor moderated discussion forums with those which do not offer tutor moderation, setting the scene for this paper. Although the courses we describe do not fit into the ‘massive’ category, and might fit the category defined as SPOCs (self Paced Open Courses) (Davidson, 2013), they do have much in common with MOOCs in that they are offered fully online to a wide geographical audience and include some form of assessment. The analysis we present in this paper may thus be of interest and relevance to a wide number of providers of online education.
Do tutors make a difference in online learning? A comparative study in two Open Online Courses

Methods

The study design was a ‘natural experiment’ providing an opportunity to make comparisons between courses offered with and without tutor involvement, with the added strength of duplication in two subject areas.

Data were abstracted in December 2018, from the self-paced Exercise and Health course from its launch in October 2015, the self-paced Injury Prevention course from its launch in April 2017 and the same two courses offered for new participants with tutor facilitation of discussion forums over a 4-week period in November 2018.

The outcomes chosen for exploration were the number of certificates gained, the number of quizzes completed and the grades gained in the quizzes, with the hypothesis that courses offered with tutor facilitation would lead to a higher proportion of certificates gained, and more quizzes completed, and with higher grades in the quizzes than when the same courses were offered without tutor facilitated discussions. The number of students posting to discussion forums and number of posts to the forums were also examined. The criteria for a certificate were clearly identified in the course material, and did not differ between the two delivery methods although they differed between the exercise and injury courses with the former requiring contributions to each of the forums and a pass in the quiz, while the latter required having accessed the resources in each section and a grade in the quiz. We did not assess student satisfaction with the course or other forms of feedback.

Analysis of the results used the configurable reports function of Moodle to describe the demographics of the participants of the four course offerings. Contributions to the discussion forums were counted through the course completion function of Moodle as well as by manual counts, and quiz results and certificates awarded were counted through the relevant functions on the course site. Counts and percentages were described, and chi square tests conducted to compare the stated hypotheses.

Results

Table 1 shows that more students enrolled in the Exercise and Health than the Injury Prevention course, however numbers in the self-paced and the tutor-led delivery versions of the courses were similar. Gender patterns were similar between both modes of delivery, although the gender balance differed between the two content areas (relatively more females in the exercise courses). Students represented a wide range of ages and professional backgrounds, and came from between 21 and 57 countries in the various courses, and across a number of geographical regions. The students in the tutor-led courses were younger and more likely to be from Africa than those enrolled in the self-paced versions.

<table>
<thead>
<tr>
<th></th>
<th>Injury self-paced (N=38)</th>
<th>Injury tutor-led (N=51)</th>
<th>Exercise self-paced (N=392)</th>
<th>Exercise tutor-led (N=345)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>13 (34%)</td>
<td>20 (39%)</td>
<td>233 (59%)</td>
<td>178 (52%)</td>
</tr>
<tr>
<td>M</td>
<td>24 (63%)</td>
<td>31 (61%)</td>
<td>140 (36%)</td>
<td>146 (42%)</td>
</tr>
</tbody>
</table>

Table 1: Demographic features of student participants.
(Percentages are of total numbers in each course)
### Table 1: Continued

<table>
<thead>
<tr>
<th></th>
<th>Injury self-paced (N=38)</th>
<th>Injury tutor-led (N=51)</th>
<th>Exercise self-paced (N=392)</th>
<th>Exercise tutor-led (N=345)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year of Birth</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;1970</td>
<td>6 (16%)</td>
<td>3 (6%)</td>
<td>102 (26%)</td>
<td>46 (13%)</td>
</tr>
<tr>
<td>1970-1979</td>
<td>8 (21%)</td>
<td>12 (24%)</td>
<td>84 (21%)</td>
<td>66 (19%)</td>
</tr>
<tr>
<td>1980-1989</td>
<td>19 (50%)</td>
<td>15 (29%)</td>
<td>94 (24%)</td>
<td>112 (32%)</td>
</tr>
<tr>
<td>1990+</td>
<td>4 (11%)</td>
<td>20 (39%)</td>
<td>102 (26%)</td>
<td>114 (33%)</td>
</tr>
<tr>
<td><strong>Occupation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical practitioner - clinical</td>
<td>2 (5%)</td>
<td>16 (31%)</td>
<td>45 (11%)</td>
<td>63 (18%)</td>
</tr>
<tr>
<td>Medical practitioner - non clinical</td>
<td>4 (11%)</td>
<td>8 (2%)</td>
<td>11 (3%)</td>
<td></td>
</tr>
<tr>
<td>Nurse/Midwife</td>
<td>2 (5%)</td>
<td>2 (4%)</td>
<td>31 (8%)</td>
<td>8 (2%)</td>
</tr>
<tr>
<td>Other</td>
<td>12 (32%)</td>
<td>6 (12%)</td>
<td>66 (17%)</td>
<td>39 (11%)</td>
</tr>
<tr>
<td>Other health professional</td>
<td>16 (42%)</td>
<td>11 (22%)</td>
<td>135 (34%)</td>
<td>153 (44%)</td>
</tr>
<tr>
<td>Student</td>
<td>2 (5%)</td>
<td>14 (27%)</td>
<td>93 (24%)</td>
<td>66 (19%)</td>
</tr>
<tr>
<td><strong>Region</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UK/Ireland</td>
<td>3 (8%)</td>
<td>6 (12%)</td>
<td>224 (57%)</td>
<td>73 (21%)</td>
</tr>
<tr>
<td>Australia/NZ/USA/Canada</td>
<td>9 (24%)</td>
<td>1 (2%)</td>
<td>32 (8%)</td>
<td>38 (11%)</td>
</tr>
<tr>
<td>Europe</td>
<td>3 (8%)</td>
<td>2 (4%)</td>
<td>47 (12%)</td>
<td>48 (14%)</td>
</tr>
<tr>
<td>Africa</td>
<td>5 (14%)</td>
<td>19 (37%)</td>
<td>24 (6%)</td>
<td>73 (21%)</td>
</tr>
<tr>
<td>Latin America</td>
<td>2 (6%)</td>
<td>4 (8%)</td>
<td>4 (1%)</td>
<td>42 (12%)</td>
</tr>
<tr>
<td>Indian subcontinent</td>
<td>8 (22%)</td>
<td>12 (24%)</td>
<td>6 (2%)</td>
<td>15 (4%)</td>
</tr>
<tr>
<td>Other</td>
<td>6 (17%)</td>
<td>1 (2%)</td>
<td>2 (1%)</td>
<td>7 (2%)</td>
</tr>
<tr>
<td>N Countries</td>
<td>21</td>
<td>25</td>
<td>43</td>
<td>57</td>
</tr>
</tbody>
</table>

Note: missing data account for numbers not adding to totals, or percentages not adding to 100.

Table 2 explores student participation in the forums. The number of posts made by students was higher during the tutor-led courses compared with the self-paced versions, as was the number of discussion threads with more than one post over the time that the courses ran in the tutor-led versions.
Table 2: Engagement of student participants with the course. (Percentages are of total numbers in each course)

<table>
<thead>
<tr>
<th>N students who posted</th>
<th>N posts</th>
<th>N students who posted</th>
<th>N posts</th>
<th>N students who posted</th>
<th>N posts</th>
<th>N students who posted</th>
<th>N posts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injury self-paced (N=38)</td>
<td></td>
<td>Injury tutor-led (N=51)</td>
<td></td>
<td>Exercise self-paced (N=392)</td>
<td></td>
<td>Exercise tutor-led (N=345)</td>
<td></td>
</tr>
<tr>
<td>Forum 1</td>
<td>4 (11%)</td>
<td>4</td>
<td>10 (20%)</td>
<td>14</td>
<td>48 (12%)</td>
<td>48</td>
<td>54 (16%)</td>
</tr>
<tr>
<td>Forum 2</td>
<td>2 (5%)</td>
<td>2</td>
<td>9 (18%)</td>
<td>10</td>
<td>42 (11%)</td>
<td>42</td>
<td>49 (14%)</td>
</tr>
<tr>
<td>Forum 3</td>
<td>2 (5%)</td>
<td>2</td>
<td>8 (16%)</td>
<td>9</td>
<td>42 (11%)</td>
<td>42</td>
<td>45 (13%)</td>
</tr>
<tr>
<td>Forum 4</td>
<td>2 (5%)</td>
<td>2</td>
<td>7 (14%)</td>
<td>7</td>
<td>42 (11%)</td>
<td>42</td>
<td>44 (13%)</td>
</tr>
<tr>
<td>Posted to all forums</td>
<td>2 (5%)</td>
<td>5</td>
<td>10 (10%)</td>
<td></td>
<td>42 (11%)</td>
<td></td>
<td>43 (12%)</td>
</tr>
<tr>
<td>Posted to any forum</td>
<td>4 (11%)</td>
<td>10</td>
<td>11 (22%)</td>
<td>40</td>
<td>48 (12%)</td>
<td>174</td>
<td>54 (16%)</td>
</tr>
<tr>
<td>N discussion threads with more than one student response</td>
<td>0</td>
<td>5</td>
<td>1</td>
<td>46</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3 explores course outcomes, and shows that in both content areas there were minimal and not statistically significant differences between the self-paced and tutor-led versions. This applied to the outcomes of completing the quiz, the grades obtained, and gaining a certificate of completion.

Table 3: Outcome comparisons between self-paced and tutor-led courses

<table>
<thead>
<tr>
<th>Outcome criterion</th>
<th>Theme</th>
<th>Group</th>
<th>N (% of each group total)</th>
<th>Chi square</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed quiz</td>
<td>Injury</td>
<td>Self-paced</td>
<td>9 (24%)</td>
<td>0.2155</td>
<td>0.64</td>
</tr>
<tr>
<td>Completed quiz</td>
<td>Exercise</td>
<td>Self-paced</td>
<td>64 (16%)</td>
<td>0.4814</td>
<td>0.49</td>
</tr>
<tr>
<td>Completed quiz</td>
<td>Exercise</td>
<td>Tutor-led</td>
<td>63 (18%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completed quiz</td>
<td>Injury</td>
<td>Self-paced</td>
<td>4 (11%)</td>
<td>0.0335</td>
<td>0.85</td>
</tr>
<tr>
<td>Completed quiz</td>
<td>Injury</td>
<td>Tutor-led</td>
<td>6 (12%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completed quiz</td>
<td>Exercise</td>
<td>Self-paced</td>
<td>55 (14%)</td>
<td>0.0843</td>
<td>0.77</td>
</tr>
<tr>
<td>Completed quiz</td>
<td>Exercise</td>
<td>Tutor-led</td>
<td>51 (15%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*table continues next page*
### Table 3: Continued

<table>
<thead>
<tr>
<th>Outcome criterion</th>
<th>Theme</th>
<th>Group</th>
<th>N (% of each group total)</th>
<th>Chi square</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certificates awarded*</td>
<td>Injury</td>
<td>Self-paced</td>
<td>6 (16%)</td>
<td>0.2153</td>
<td>0.64</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tutor-led</td>
<td>10 (20%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Certificates awarded**</td>
<td>Exercise</td>
<td>Self-paced</td>
<td>44 (11%)</td>
<td>0.0012</td>
<td>0.97</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tutor-led</td>
<td>39 (11%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Certificates for the injury courses awarded if the resource documents in each of the 4 sections were downloaded and the quiz completed (pass not required).

**Certificates for the exercise courses awarded if there was a post to each of the 4 discussion forums and the quiz was passed at 8/10.

There was a trend towards higher quiz scores among younger participants in both versions of the exercise course.

### Discussion

It appears that tutor led discussions have increased the number of discussion posts, as well as the numbers of discussions with interaction between student and tutor reflected by the number of threads with more than one post. However, there were no differences in the course outcomes in terms of quizzes completed, marks gained, or course completion certificates awarded between the versions of the courses with and without online tutors to lead the discussions. Although there were some differences between the two content areas in terms of the outcomes measured, the results of no difference between delivery method with and without tutors are consistent between the two content areas.

None of the courses attracted MOOC type numbers – the courses were not delivered by a recognised MOOC provider and were not linked to any identifiable professional organisation. Numbers were much larger for the exercise courses, where the social media footprint for advertising was larger due to the established recognition and position of Exercise Works! in the social media space. Although not by design, the numbers in both versions of each content area were similar, allowing the comparisons we report.

The students in the exercise courses were more likely to be female (59% and 52% in the exercise courses compared with 33% and 39% in the injury courses) possibly a reflection of the interest in exercise among physiotherapists a predominantly female profession. Students in the exercise courses were less likely to come from the global south than those in the injury courses (12% and 38% in the exercise courses came from Africa, Latin America or the Indian subcontinent compared with 39% and 69% in the injury courses), probably a result of the social media advertising footprint. However, both sets of courses attracted students from a wide range of professional groups in the health field, and from a wide geographical area. Younger students were more likely to complete the quiz with a high mark, and since the tutor-led groups were younger than the self-paced group we might have expected higher marks in the tutor-led groups.

Discussion forums were available in each of the four course iterations, with invitations to reflect on a question related to the content in the resources provided in each section. Certification in the exercise courses depended on having posted to the forum in each section, although this was not a
Do tutors make a difference in online learning? A comparative study in two Open Online Courses

requirement in the injury courses. Although we saw an increase in the proportion of students who posted to the tutor-led version on the injury course, this difference between tutor-led and self-paced version was smaller in the exercise course. It may be that obtaining a certificate was a motivation to post to the exercise forums. In both content areas, there were more discussion posts in the tutor-led than the self-paced versions, and a considerable increase in the threads with more than one student post indicating that discussions took place rather than just a posting of reflections. In the tutor-led versions, numbers of posts decreased over the time that the courses ran, consistent with our previous experience.

Other experience

In July/August 2016, Physiopedia, in association with Exercise Works!, offered a 6-week MOOC ‘Physiotherapy, Exercise and Physical Activity’ (PEPA MOOC), using many of the same presentations as in the Exercise and Health courses we describe (Lowe, 2017). Online discussion forums were facilitated by expert tutors, as in the tutor-led course we describe. There were 8482 participants (86% physiotherapists/physical therapists) from 157 countries. The participants contributed 10799 discussion posts in total, with 561 (7%) of total participants contributing each week. 1050 quiz attempts were made, with 859 passes (12% and 10% of total participants respectively). Completing an evaluation was one of the criteria for a certificate, and 559 (7%) did so, although the number of certificates awarded was not included in the report. Although the course was more intensive than the ones we describe and the structure somewhat different, as was the audience and number of participants, the proportion of students achieving measurable outcomes were very similar to, or lower than, the proportions in both versions of the exercise course we report here.

We have previously reported completion (certification) rates of 15% in the early experience of the Peoples-uni Open Online Courses (Heller et al., 2017), and that results from MOOCs in different subject areas confirm similar, or lower, levels of course completion than these. The certification rates in this paper, are thus consistent with the experience of other online courses outside the for-credit education system.

Our findings are consistent with other experiments, such as those by Cho and Tobias (2016) and Onah et al. (2015) in finding no difference in student outcome as a result of tutor-led discussions in online education. Therefore Onah et al. (2015) suggested that student motivation might be more important in predicting success. Similarly, Brooker, Corrin, de Barba, Lodge and Kennedy (2018) reported that in a professional development MOOC (which would be consistent with our situation), professional development motivation contributed to the final grade, and their review of the literature emphasised the importance of motivation in student participation and performance. Although we did not measure motivation, our results lead us to conclude that motivation to complete the course is likely to be a confounding factor, influencing both commitment to participation in discussion forums and the outcomes of grades and course completion.

In light of little discernible difference in outcome between tutor-led and non tutor-led courses, the utility of the time cost to tutors is in question. The advantages of having courses available both for enrolment at any time and also for later study after the end of a timetabled course, rather than only for the period over which discussions are timetabled, adds another possible benefit of self-paced learning. Despite most MOOCs being offered to a timetable with tutors, self-paced MOOCs are also available, in 2015 it was stated that 20% of all MOOCs were in this form (Shah, 2015).
Generalising our results

The structure of our online courses is similar to others in the xMOOC category, although we do not rely on the more usual tutor generated video presentations (Zhan et al., 2015). There does not seem to have been a vigorous debate about the merits of videos compared with other methods of information presentation in the literature. Peoples-uni offers its own certification, and does not articulate with any accredited educational or professional provider to provide academic or professional credit. Thus we should not extrapolate our findings beyond short online courses offered without academic credit.

MOOCs are increasingly available in health and medical areas, and appear to facilitate effective communication among international communities and disseminate knowledge across health specialities and across geographies (Goldberg & Crocombe, 2017). The ability we describe to reach a wide range of professional groups, as well as geographical settings including those in low- to middle-income countries is encouraging; this is especially as the reach of the internet is rapidly expanding.

“In developed countries, slow and steady growth has increased the percentage of the world’s population using the Internet, from 51.3 per cent in 2005 to 80.9 per cent in 2018. In developing countries, more-sustained growth has shown an increase from 7.7 per cent in 2005 to 45.3 per cent at the end of 2018” (International Telecommunication Union News, 2018).

The injury course is also available for academic credit as part of a master’s programme, although of course there are major differences in delivery, mandatory discussion forums and assessment. We are encouraged to offer more of our academic for-credit courses on our Open Online Courses site, helping to meet the Peoples-uni major mission of capacity building in low- to middle-income countries. Learning the lessons from this evaluation, we will focus on self-paced delivery rather than delivery to a timetabled with tutor led discussion forums.

Study Limitations

The educational outcomes we report, although easily measurable, may not reflect the outcomes that matter in terms of meeting educational objectives (Otto, Bollmann, Becker & Sander, 2018). As stated in the introduction to the course material, the goal of the Exercise and Health course was described as

“An inter-disciplinary educational resource to help healthcare professionals understand the size of the problem of physical inactivity in populations globally, the role of physical inactivity in disease causation and the benefits of exercise in treatment and prevention, and to encourage us to perform and evaluate interventions to increase physical activity in our settings.”

Similarly, the Injury Prevention course goal was

“…designed to learn how to collect information on the burden of injury in your setting, understand the causes and risk factors for injury, and develop and evaluate intervention programs relevant to your setting. This will be underpinned by the principles and characteristics of a public health approach to prevention”.

While the outcome measures we have used can assess knowledge and commitment, the use of MCQs provides only a limited assessment and depends on the quality of the questions. Commitment was assessed by course completion, but any follow-up actions resulting from the courses were not
assessed. Nevertheless, our limited study objective of comparing outcomes between self-paced and tutor-led delivery mechanisms is not compromised by the use of the measurable outcomes we have chosen.

In addition, numbers in the courses are relatively small and may not be relevant to MOOCs with their different structures and size. The power to examine differences between the two Injury courses is very low, but the numbers in the exercise courses provide the power to examine a moderate effect size. However, the consistency in findings between the two different course content areas adds to the strength of the conclusions reached.

Conclusions

Our findings suggest that it is possible to achieve similar outcomes through self-paced learning compared with courses which include tutor-led discussions in online courses such as those we describe. This is consistent with other experimental data indicating little effect of tutor moderated discussion on student outcome, and leads us to suggest that student motivation may be a confounding factor, influencing both participation in discussion forums and student outcome. Although we are careful not to extrapolate too far beyond the professional development type of short online course and the outcomes that we describe, we feel that these results may be relevant to others designing online courses, including MOOCs. We encourage further experiments to explore the effect of various components of online courses on student outcome.

While Peoples-uni is not a major provider of not-for-credit online courses, and mainly supplies a niche market at present, the lessons learned from this evaluation will allow us to continue to develop, host and offer online courses to a wide geographical audience. We are encouraged to continue to offer courses on our Open Online Courses site, helping to meet the Peoples-uni major mission of capacity building in low- to middle-income countries. Learning the lessons from this evaluation, we will focus on self-paced delivery rather than delivery to a timetable with tutor led discussion forums.

References


Do tutors make a difference in online learning? A comparative study in two Open Online Courses


Community of Inquiry in Web Conferencing: Relationships between Cognitive Presence and Academic Achievements

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Abstract

In an increasingly digital society, educators are encouraged to use synchronous online technologies. This study attempts to explore the community of inquiry in a web conferencing system through synchronous interactions and focuses on the relationships between cognitive presence and academic achievements. Participants were teacher candidates enrolled in a one-semester synchronous course at an online program of a public university. Community of Inquiry Questionnaire, final exam scores and student discussion messages were used to gather data. Results indicated that while moderate positive relationships were found between cognitive and social presences, no significant correlation was addressed between teaching and social presences and also between teaching and cognitive presences. In addition, cognitive presence was found moderately positive correlated with academic achievements. The role of the instructor and the affordances of web conferencing system positively influenced the students’ cognitive presences. Further research directions and practical implications about the synchronous instructions were also included.

Keywords: synchronous online learning, community of inquiry, web conferencing, cognitive presence, academic achievements

Introduction

Recent improvements in online learning have made the use of synchronous online settings more popular for the institutions. With their new tools, synchronous settings provide some transformations for online learning (Kuo, Walker, Belland, & Schroder, 2013). The advantages of using synchronous tools include real-time communication between the instructor and learners or among learners, immediate response from the instructor in a sense of a real classroom learning setting. It also allows learners to engage in learning with peers and the instructor at the same time. With the sense of online learning community, learners and instructors can build collaborative knowledge (Shea & Bidjerano, 2009) and meaningful learning through reflection and discourse (Gutiérrez-Santiuste, Rodríguez-Sabiole, & Gallego-Arrufat, 2015). In this sense, researchers reported that meaningful learning outcomes are provided by following the Community of Inquiry (CoI) framework in the online instructional process (Rourke & Kanuka, 2009). The framework is considered as an effective way to explain the interactions among people, content and system for successful teaching and learning (Garrison, Anderson, & Archer, 2001; 2010).

Garrison, Anderson and Archer (2010) pointed out that the Col framework has become a leading model that can be used as a practical approach for exploring or evaluating the quality of the inquiry. It should be noted that research on CoI in higher education has generally examined the issue within asynchronous and blended instructional settings, only few studies investigated whether and how synchronous online environments may be understood within CoI framework.
Study Framework

Online learning settings include communication and personalization dimensions. According to Gregori, Torras, and Guasch (2012) researchers need to analyse a wide range of actions to define the interactions and instructors use the potential of interactions that supports meaningful learning (Kanuka & Garrison, 2004) and facilitates students satisfaction (Hosler & Arend, 2012; Maddrell, Morrison & Watson, 2011). Col explains the online instructional process in three dimensions as teaching, social, and cognitive presences (Garrison et al., 2001). Following the model, online instructional processes may be described and analysed through the relationships among these three presences (Gregori et al., 2012). A summary of Col framework is depicted in Figure 1.

![Figure 1: Community of inquiry framework (Garrison et al., 2001).](image)

Successful online courses create a Col where students interact with one another, the instructor and the learning materials to develop new knowledge and skills (Arbaugh, 2008; Boston et al., 2009; Garrison & Arbaugh, 2007). Researchers point out that when online courses have a strong Col, students participate in discussions, perceive that they learn more, are more satisfied with the learning experience (Garrison & Cleveland-Innes, 2005; Richardson & Swan, 2003).

In the framework, cognitive presence is defined in relation to the meaning construction and higher levels of thinking (Kanuka & Garrison, 2004). It is discussed in four phases of critical inquiry: triggering event, exploration, integration and resolution (Garrison et al., 2001). Triggering event occurs when participants gain perceptions about the issues or problems identified for further inquiry.

In exploration phase, studying on the problems individually or collaboratively through critical reflection and discourse takes place. In the community, learners construct meaning from the reflections in the integration phase. Learners practically try out their ideas or conceptions in the resolution phase (Darabi, Arrastia, Nelson, Cornille & Liang, 2011). Social presence is defined as the feeling connected with others (Arbaugh et al., 2008). Effective communication, open communication and group cohesion is considered in the context of social presence. Social presence is critical for collaboration because it takes a role in achieving cognitive objectives by supporting critical thinking and facilitating knowledge exchange (Garrison, Anderson, & Archer, 2010). Teaching presence represents the instructor as an active member of the community who designs the learning environment and comprises of the teachers’ roles in facilitating learning tasks and presenting the topics. Overall, Shea, Li, Swan and Pickett (2005) posited that social interaction is a required element needed in online instructional process. At this point; an idea come into mind that; basic interactions (student-student, student-instructor and student-content) may be reshaped in online synchronous courses and the synchronous functions may provide a different way of senses of community of inquiry constructs.

**Synchronous Online Learning**

Due to the nature of the delivery methods and the affordances of the web conferencing system, the development of the community may be differentiated from those of asynchronous online learning settings. Synchronous settings allow instructor to provide a live lecture or presentation. Students attend to a virtual classroom which provides feelings similar to the real classroom. Students are allowed to share knowledge in the discussion boards, or send private messages to the peers. Real time communication between instructor and students is enhanced through features such as audio, video, whiteboard. Participant list, text chat room, video/audio meeting room, notes, and surveys are the frequently used in synchronous sessions. In addition; instructors have opportunity to carry out the activities through direct presentation, discussion or investigation strategies. Moreover, electronic whiteboards can be used to work collaboratively on the same activity.

**Related Literature**

A series of studies were carried out focusing on sense of community of inquiry and reported various levels of relationships between cognitive, social and teaching presences and learning outcomes (Garrison, Cleveland-Innes, & Fung, 2010; Kozan & Richardson, 2014; Pisutova-Gerber & Malovicova, 2009; Rockinson-Szapkiw, Wendt, Whiting, & Nisbet, 2016; Schellens & Valcke, 2006). For instance, Shea and Bidjerano (2009) reported that students’ cognitive presence could be predicted through perceived teaching and social presence. Similarly, using a standard multiple regression analysis, Archibald (2010) found that social presence makes a higher contribution to the explanation of cognitive presence than teaching presence. In another study, undergraduate students were surveyed and a moderate positive relationship among CoI constructs was reported in a blended setting (Maddrell et al., 2011). In another study, Daspit and D’Souza (2012) analysed the wiki environment through CoI and found that teaching presence and social presence were correlated to cognitive presence. Öztürk (2015) created a learning community on Facebook and addressed high correlation between learners’ perceived social, cognitive, and teaching presences. Other research also establishes a high correlation between social and cognitive presence (Shea & Bidjerano, 2009), as well as a dynamic relation between the three presences and a causal relation of social and teaching presence to the perception of cognitive presence (Garrison et al., 2010; Archibald, 2010).
There is also some evidence that the sense of community is significantly associated with perceived learning (Rovai, 2002; Shea, 2006; Shea, Li & Pickett, 2006). In this regard, Shea and Bidjerano (2010) surveyed over 2000 college students and documented the relationships of CoI to describe learning outcomes in hybrid and fully online learning environments. The study of Maddrell et al. (2011) concluded that only cognitive presence correlates significantly and positively with achievement measures. On the other hand, in a recent study; instructors analysed cognitive presences with an automatic system and reported the relationships between learners’ cognitive presence and their social participation within asynchronous online discussion by classifying messages (Hind, Idsissi, & Bennani, 2018). Lee and Huang (2018) also reported that providing more interaction opportunities helped students develop higher social presence; however, there was no relationship between social presence and learning outcomes. In another study; a multiple linear regression analyses revealed moderate relationship between learners’ perceived teaching presence and cognitive presences (Huang, Law & Lee, 2018).

**Need for the study**

An effective online learning setting should facilitate easy communication and feedback. In this sense, the technology used to support online courses may affect to the interaction level between students and instructors (Rubin, Fernandes, & Avgerinou, 2013). In online courses, there are several aspects of the technology that are likely to affect teaching and learning process. Synchronous online settings present some advanced tools for interactions, however, learners do not have much time for real-time messaging, discussing, or collaborating (Stewart, Harlow, & DeBacco, 2011), and also searching for information, critical thinking, receiving feedback or socially interacting in a limited lesson period (Bonk & Zhang, 2006). Thus; student-instructor, student-student online dialogues, spontaneity, sense of community and being perceived by the others may take place different from asynchronous settings (Stodel, Thompson, & MacDonald, 2006). Accordingly, synchronous online learning settings have distinct pedagogical demands owing to the nature of interactivity.

Although there is a growing emphasis on determining interactions on asynchronous online learning, the studies composed of synchronous interactions are still scarce (Akyol & Garrison, 2011; Pisutova-Gerber & Malovicova, 2009; Rourke & Kanuka, 2009). Thus, further studies are still needed to answer whether CoI constructs reflecting the synchronous learning process via interactions among students, instructor and content will lead to deep and meaningful learning.

On the other hand; cognitive presence is recognized as a core concept in the CoI definition, and is considered as one of the key elements of effective online learning (Garrison et al., 2001). Some evidences are reported positive correlation between cognitive presences, sense of community and perceived learning, academic achievements (Shea & Bidjerano, 2010), however the learning setting in those studies are either asynchronous or blended. In this sense; Rubin et al. (2013) noted some inconsistencies in terms of the study contexts in which further research is warranted.

In order to formulate the academic achievements in synchronous online settings; the influences of teaching, social and cognitive presences were discussed through the affordances of web conferencing. Accordingly, this study attempts to determine the relationships between presences and the academic achievements web conferencing through the lens of CoI.

**Aim of the Study**

Following the CoI framework, one aim of this study is to gain an insight to the relationships between cognitive, teaching and social presences and the academic achievements in web conferencing.
Many authors used the theoretical framework to assess cognitive presence indicators and descriptors, both in online and blended education (e.g. Akyol & Garrison, 2011; Kanuka & Garrison, 2004; Stein et al., 2007). In this study; specifically, cognitive presence was taken into consideration relevant to academic achievements in one research question.

In line with the overall purpose of the study, the following research questions were directed:

1. What is the relationship between the perceived teaching, cognitive and social presences in web conferencing?
2. What is the relationship between the perceived cognitive presences and the academic achievements in web conferencing?

**Method**

**Participants and Setting**

A quantitative correlational analysis is carried out in the study. The participants were 72 (39 male, 33 female) undergraduate sophomore students (between 18-24 age) enrolled in an instructional technology program at a public university in Turkey. The program trains teachers to teach IT courses in secondary schools. Participants had enough computer literacy to follow the online courses and to employ the tools used in web conferencing. The participants had little prior knowledge about programming. The study was conducted in an introductory programming classroom during 14 weeks, 4 lesson hours per week. During the implementation, course activities, tasks, strategies and assessments were all organized to facilitate both collaborative and individual learning. The synchronous meetings were provided between 90-120 min per week. Most of the learners continued on participating in the virtual class during the semester.

During the instructional process; Adobe Connect web conferencing system was used as a delivery tool. Adobe Connect as a web conferencing system provides audio-visual communication and interactions between students and instructors synchronously. The instructor used both pictorial and audial form of presentation and enriched documents such as PowerPoint, PDF files, pictures and videos during the presentations. During and after presentations, students are allowed to discuss on the subjects. The discussions were about presentations, shared pictures, links or videos followed in the lesson. In addition; students are allowed to exchange ideas, provide feedback for peers and receive feedback from the instructor and peers about their tasks via the system. Students were also allowed to share a variety of files; images, presentations, audio, video and their desktop including running applications. All lessons are recorded with the Adobe Connect recording system.

**Data Collection and Analysis**

Three data sources were used in this study: Col Questionnaire, messages in video records and final test scores. The instruments are briefly described in Table1.

<table>
<thead>
<tr>
<th>Data Collection Tools</th>
<th>Used for</th>
</tr>
</thead>
<tbody>
<tr>
<td>Col Questionnaire</td>
<td>Identifying perceived Col constructs and relations among them (teaching, social and cognitive presences)</td>
</tr>
<tr>
<td>Messages in Video Records</td>
<td>Determining and explaining relations between perceived cognitive presence and academic achievements</td>
</tr>
<tr>
<td>Final Test</td>
<td></td>
</tr>
</tbody>
</table>
Community of Inquiry Questionnaire (CoIQ): The Turkish version of the CoI questionnaire was used to determine learners’ perceptions of each presence. Arbaugh et al. (2008) originally developed the instrument and Öztürk (2012) validated its Turkish version. The instrument consisted of 34 items in three dimensions (teaching presence: 13, social presence: 9, cognitive presence: 12) in a 5-point Likert type scale ranging from 1-Strongly Disagree to 5-Strongly Agree. In previous studies, it was used for similar purposes (Arbaugh et al., 2008; Shea & Bidjerano, 2009). The questionnaire was administered to the participants before the final exam in a classroom in approximately 40 min when the students came together for the final exam at the end of the semester. Descriptive analysis was conducted to analyze CoIQ responses. The results were presented including mean, frequency, percentage and standard deviations and interpreted in terms of teaching, social and cognitive presence measures.

Final test scores: Besides students’ self-report of presences, their final test scores as academic achievements in the form of grades were also used in the study. The author who was also the instructor developed an open-ended test to assess both conceptual and strategic programming knowledge. Another instructor also reviewed the test items for content validity to ensure measuring the related objectives. After the instructors concurred that the instrument was valid, the test was administered in the classroom at the end of the semester.

In order to analyse the final test scores; the researcher and another instructor first assigned the scores for the questions individually. Then they discussed about each item on the test. After a negotiation for refining the scores, the final scores were calculated. In order to explore the relationships between perceived CoI constructs and academic achievements, Pearson correlation coefficient was calculated.

Online discussion messages: Both text and audio messages in the video records of the lectures were used to explain the experiences reflecting the perceived presences. Watching the video records, the researcher transcript narrations of the participants and inserted them to the text messages.

Cognitive Presence Categories Template (CPCT) developed by Garrison et al. (2001) was used to analyse discussion messages to identify cognitive presences of students. Four phases of cognitive presence indicators are included in the template: triggering event, exploration, integration and resolution. The template was also used for similar cognitive presence analysis in other CoI studies (Öztürk & Deryakulu, 2011). Transcript analysis of the of discussions was conducted in order to explore students’ cognitive presences referring to the indicators in the template. The author and a research assistant applied the transcript analysis with a negotiated coding approach. After coding the transcripts individually, they discussed these together until they come to an exact agreement. The categories, indicators and units of analysis are worked out iteratively with regard to the events identified in the template.

Results

In the results section; findings about the relationships among the perceived presence measures were presented first, and then the relationships between the cognitive presences and academic achievements were discussed.

Measures of teaching, cognitive and social presences

The mean scores from students’ responses for CoIQ were evaluated in the ranges and descriptors as (1.00-1.79: not satisfactory, 1.80-2.59: merely satisfactory, 2.60-3.39: satisfactory, 3.40-4.19:
highly satisfactory, 4.20-5.00: excellent). Carifio and Perla (2008) pointed out that while Likert type items may well be ordinal, Likert scales consisting of sums across many items will be interval. Hence, mean values may be used to transfer ordinal data into intervals so that parametric tests can be conducted. Similar ranges were used for some other Likert type instruments (Caparaz, Llorca, Mance & Red, 2013).

Teaching Presence

The descriptive results for perceived teaching presence are shown in Table 2.

Table 2: Descriptive measures of teaching presence scores

<table>
<thead>
<tr>
<th>Categories</th>
<th>Items</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design and organization</td>
<td>The instructor,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>clearly communicated important course goals.</td>
<td>3.44</td>
<td>1.29</td>
</tr>
<tr>
<td></td>
<td>clearly communicated important course topics.</td>
<td>3.56</td>
<td>1.24</td>
</tr>
<tr>
<td></td>
<td>provided clear instructions on how to participate in course learning activities.</td>
<td>3.51</td>
<td>1.07</td>
</tr>
<tr>
<td></td>
<td>clearly communicated important due dates/time frames for learning activities.</td>
<td>3.89</td>
<td>1.05</td>
</tr>
<tr>
<td>Facilitation</td>
<td>was helpful in identifying areas of agreement and disagreement on course topics that helped me to learn.</td>
<td>3.67</td>
<td>0.99</td>
</tr>
<tr>
<td></td>
<td>was helpful in guiding the class towards understanding course topics in a way that helped me to clarify my thinking.</td>
<td>3.9</td>
<td>0.99</td>
</tr>
<tr>
<td></td>
<td>helped me to keep course participants engaged and participating in productive dialogue.</td>
<td>4.03</td>
<td>0.94</td>
</tr>
<tr>
<td></td>
<td>helped me keep the course participants on task in a way that helped them to learn.</td>
<td>3.85</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>encouraged course participants to explore new concepts in this course.</td>
<td>3.95</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Instructor actions reinforced the development of a sense of community among course participants.</td>
<td>4.03</td>
<td>0.96</td>
</tr>
<tr>
<td>Direct instruction</td>
<td>helped me to focus discussion on relevant issues in a way that helped me to learn.</td>
<td>3.92</td>
<td>0.91</td>
</tr>
<tr>
<td></td>
<td>provided feedback that helped me to understand my strengths and weaknesses relative to the course’ goals and objectives.</td>
<td>3.36</td>
<td>0.92</td>
</tr>
<tr>
<td></td>
<td>provided feedback in a timely fashion.</td>
<td>3.85</td>
<td>1.04</td>
</tr>
</tbody>
</table>

The overall mean value of the responses for the perceived teaching presence is highly satisfactory. Students' highest average scores (4.03: highly satisfactory) for teaching presence were about two items of the facilitation category: "The instructor helped me to keep course participants engaged and participating in productive dialogue" and "Instructor actions reinforced the development of a sense of community among course participants." Other items were assessed in highly satisfactory level.
Social Presence
The mean scores of perceived social presence are outlined in Table 3.

<table>
<thead>
<tr>
<th>Categories</th>
<th>Items</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affective expression</td>
<td>Getting to know other course participants gave me a sense of belonging in the course.</td>
<td>3.01</td>
<td>1.06</td>
</tr>
<tr>
<td></td>
<td>I was able to form distinct impressions of some course participants.</td>
<td>3.82</td>
<td>0.95</td>
</tr>
<tr>
<td></td>
<td>Online or web-based communication is an excellent medium for social interaction.</td>
<td>2.93</td>
<td>0.95</td>
</tr>
<tr>
<td>Open communication</td>
<td>I felt comfortable conversing through the online medium.</td>
<td>3.62</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>I felt comfortable participating in course discussions.</td>
<td>3.86</td>
<td>1.04</td>
</tr>
<tr>
<td></td>
<td>I felt comfortable interacting with other course participants.</td>
<td>2.92</td>
<td>1</td>
</tr>
<tr>
<td>Group cohesion</td>
<td>I felt comfortable disagreeing with other course participants while still maintaining a sense of trust.</td>
<td>3.78</td>
<td>0.91</td>
</tr>
<tr>
<td></td>
<td>I felt that my point of view was acknowledged by other course participants.</td>
<td>2.76</td>
<td>0.83</td>
</tr>
<tr>
<td></td>
<td>Online discussion helped me to develop a sense of collaboration.</td>
<td>2.78</td>
<td>0.96</td>
</tr>
</tbody>
</table>

Students’ perceptions towards social presence sub-scale was assessed in satisfactory level (M=3.62). 47 of the participants assessed the item “I felt comfortable disagreeing with other course participants while still maintaining a sense of trust” in excellent level. The items related to the discussions, sense of collaboration, sense of belonging in the course were all assessed in satisfactory level.

Cognitive Presence
Students’ perceptions about the items related to cognitive presence are shown in Table 4.

<table>
<thead>
<tr>
<th>Categories</th>
<th>Items</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triggering event</td>
<td>Problems posed increased my interest in course issues.</td>
<td>3.27</td>
<td>1.04</td>
</tr>
<tr>
<td></td>
<td>Course activities piqued my curiosity.</td>
<td>3.18</td>
<td>0.89</td>
</tr>
<tr>
<td></td>
<td>I felt motivated to explore content related questions.</td>
<td>3.19</td>
<td>0.98</td>
</tr>
<tr>
<td>Exploration</td>
<td>I utilized a variety of information sources to explore problems posed in this course.</td>
<td>3.34</td>
<td>1.04</td>
</tr>
<tr>
<td></td>
<td>Brainstorming and finding relevant information helped me to resolve content related questions.</td>
<td>3.32</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>Online discussions were valuable in helping me appreciate different perspectives.</td>
<td>3.45</td>
<td>0.94</td>
</tr>
<tr>
<td>Integration</td>
<td>Combining new information helped answer questions raised in course activities.</td>
<td>3.26</td>
<td>1.01</td>
</tr>
<tr>
<td></td>
<td>Learning activities helped me to construct explanations/solutions.</td>
<td>3.08</td>
<td>1.08</td>
</tr>
<tr>
<td></td>
<td>Reflection on course content and discussions helped me understand fundamental concepts in this class.</td>
<td>3.18</td>
<td>1.06</td>
</tr>
<tr>
<td>Resolution</td>
<td>I can describe ways to test and apply knowledge created in this course.</td>
<td>3.19</td>
<td>1.01</td>
</tr>
</tbody>
</table>
The mean cognitive presence score was as satisfactory (M=3.24). The item “Transferring knowledge to the work or other activities” was assessed with lower scores than other items (2.97) and the items about utilizing a variety of information sources were assessed with highest score (3.34). In this subscale 40 students’ scores were between satisfactory and highly satisfactory level. The mean score for the item “I felt that my point of view was acknowledged by other course participants” (M=2.76), which was the lowest score of all items.

Overall, students’ responses to the CoIQ items about the Col constructs were satisfactory. The results indicate that the learning environment provided by web conferencing was evaluated as highly satisfactory (M=3.76) with regard to teaching presence scores; satisfactory (M=3.28) for social presence scores and satisfactory (M=3.24) for cognitive presence scores.

**Relationships between presences and academic achievements**

Final exam scores were used to determine the relationships between academic achievements and presence scores.

In order to determine the correlations between the perceived presence scores from CoIQ and academic achievements, the Pearson correlation coefficient was calculated. The correlations were shown in Table 5.

<table>
<thead>
<tr>
<th>Average Scores</th>
<th>Teaching Presence</th>
<th>Social Presence</th>
<th>Cognitive Presence</th>
<th>Final Exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching Presence</td>
<td>1</td>
<td>.200</td>
<td>.056</td>
<td>.053</td>
</tr>
<tr>
<td>Social Presence</td>
<td>.200</td>
<td>1</td>
<td>.578**</td>
<td>.180</td>
</tr>
<tr>
<td>Cognitive Presence</td>
<td>.056</td>
<td>.578**</td>
<td>1</td>
<td>.722**</td>
</tr>
<tr>
<td>Final Exam Scores</td>
<td>.053</td>
<td>.180</td>
<td>.722**</td>
<td>1</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).

Table 5 illustrates that correlation between cognitive presence mean scores and final exam scores is moderately positive (r = 0.722). In accordance with Cohen (1998), the r value (0.5-0.75) is considered as moderately positive. The teaching presence and social presence mean scores were not significantly correlated with final exam scores. Only cognitive presence mean scores were correlated moderate positive (r = 0.578) with average social presence scores.

**Presence measures with regard to academic achievements**

Using percentile ranking, students with the percentile rank of average final score over 73% were classified as high achievement group (HG); those with percentile rank of score (27% - 72%) were assigned as average (AG), and those with below 26% were considered as low achievement group (LG). Similar way is used in some other studies in order to define the groups regarding to their achievements (Bornmann, Schier, Marx & Daniel, 2011; Butzin, 2001). The comparison of descriptive results in terms of teaching, social and cognitive presence scores of three groups (LG, AG and HG) is illustrated in Figure 2.
Figure 2 shows that HG has the highest and LG has the lowest average scores in the three presences and cognitive presence scores of LG are considerably lower than teaching presence and social presence scores.

Seeing that, three basic assumptions of ANOVA including normality, homogeneity of variances, and independence of the samples were verified; one-way ANOVA was conducted to compare teaching, social and cognitive presence scores with regard to the groups. The results were presented in Table 6.

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Teaching Presence</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>.688</td>
<td>2</td>
<td>.344</td>
<td>.641</td>
<td>.530</td>
</tr>
<tr>
<td>Within Groups</td>
<td>37.597</td>
<td>70</td>
<td>.537</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>38.285</td>
<td>72</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Social Presence</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>1.015</td>
<td>2</td>
<td>.507</td>
<td>1.292</td>
<td>.281</td>
</tr>
<tr>
<td>Within Groups</td>
<td>27.486</td>
<td>70</td>
<td>.393</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>28.501</td>
<td>72</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cognitive Presence</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>9.481</td>
<td>2</td>
<td>4.741</td>
<td>23.733</td>
<td>.000</td>
</tr>
<tr>
<td>Within Groups</td>
<td>13.982</td>
<td>70</td>
<td>.200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>23.463</td>
<td>72</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The results indicate that there were no statistically significant differences between groups (HG, AG, LG) in teaching presence scores having values of \( F(2,70) = .641, p = .530 \). Similarly, there were no statistically significant differences among the mean values in social presence scores of the groups \( F(2,70) = 1.292, p = .281 \). However, in terms of cognitive presence, a significant difference existed among the scores of HG, AG, LG \( F(2,70) = 23.733, p = .000 \), at the \( p < .05 \) level.
Since the significant difference existed only between cognitive presence scores of the groups LG, AG, and HG (see Table 6), the analysis of relationships between perceived presence scores and academic achievements was directed on perceived cognitive presences. Thus, students’ discussions were analysed in order to explain their cognitive presence measures which emerged in web conferencing. Some example statements from these discussions were presented in Appendix 1. Students’ text and narrations as discussion messages were analysed through CPCT with inter-rater reliability of two raters having Cohen’s Kappa 0.87 after discussion to resolve discrepancies. The mean scores for message analysis were interpreted for HG, AG, and LG and shown in Table 7.

Table 7: Cognitive presence scores from messages analysed through CPCT

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>HG</td>
<td>12</td>
<td>.7307</td>
<td>.12759</td>
</tr>
<tr>
<td>AG</td>
<td>12</td>
<td>.6682</td>
<td>.11920</td>
</tr>
<tr>
<td>LG</td>
<td>12</td>
<td>.5922</td>
<td>.09729</td>
</tr>
<tr>
<td>Total</td>
<td>36</td>
<td>.6637</td>
<td>.12592</td>
</tr>
</tbody>
</table>

The mean cognitive presence scores gathered from discussions were (HG= .7307, AG=.6682 and LG=.5922). The results show that the mean values of AG are saliently higher than those of LG.

**Discussion**

Garrison (2000) emphasized that there should be an interaction between the cognitive, social and teaching presences. In this sense, some research studies reported significant relationships among cognitive, social and teaching presences (Shea & Bidjerano, 2012; Kozan & Richardson, 2014). In this study, focusing on presences, the relationships between cognitive presence and academic achievements were discussed in web conferencing. The results indicated that the scores gathered from the questionnaire about cognitive, social and teaching presence scores were close to each other. While there was no statistically significant difference between the groups (HG, AG, LG) in teaching presence scores and in social presence scores; students with higher final grades having perceived cognitive presence scores were statistically significantly higher than the students having average and lower final grades. Accordingly, the results were discussed by focusing on the relationships among the presences first, and then the relationships between the cognitive presence and the academic achievement scores.

**Relationships among the presences in web conferencing**

Cognitive presence refers to processes of planning, monitoring and adapting strategies for knowledge construction. In this study, instructor asked students to solve problems and promoted them to discuss about the problems to write optimal programming codes. In accord to the study of Gašević, Adesope, Joksimović & Kovanović (2015) reported that, the instructor’s feedback came front in the activities that played a positive role in terms of the relationship between teaching presence and cognitive presence. Similarly in this study, students’ responses indicate that the
instructor could organize the course to encourage learners' collaborative study. He also reinforced the development of a sense of both cognitive and social presences by keeping students engaged in productive dialogues. Regarding teaching presence, it was seen that the instructors' role in the process facilitated learners' knowledge construction. In this sense; learners' perspectives indicated that they could understand the problems, use their previous knowledge, and get support from peers in practice sessions. This is consistent with the suggestion of Shea and Bidjerano (2012) that the instructor should provide opportunities to support and sustain critical discussions for quality online learning. In addition, the organizational role of the instructor has also become prominent in the students' cognitive presences. Because, the students' perspectives in the discussion messages indicate that, the learning environment via web conferencing was organised as they were able to share their ideas about problems, compare their programming code pieces, and criticize their own codes or peers' codes. Similar to this finding, Kumar, Dawson, Black, Cavanaugh and Sessums (2011) pointed out that quality teaching presence requires instructors who not only should have excellent online pedagogical skills but also should have organizational skills, and experience with online courses.

Survey data also provided hints about social presence that web conferencing relatively fostered socialization. Students' feelings were generally positive about conversing with each other through web conferencing. The items about social presence were generally assessed as higher than motivational factors. It was may be due to the off-task communication that has facilitated sense of community. The enhanced affordability of synchronous interaction between the instructor and students communication was provided with both in text and video format via webcams. Even this kind of interactions were taken place for a short time, it provided a social atmosphere to project themselves as real people into the community, and it supported the students to easily present their idea in a trustworthy way. That is to say, students interacted with peers or instructor as real people via asking, sharing and discussing actions synchronously.

In sum, the affordances of the web conferencing system played a facilitator role in developing students' cognitive presences. Students' responses reflected that using chat area for text messaging and audio options for talking provided both verbal cues and senses of belonging in the lesson. Although, students do not have much time to use the tools of web conferencing system in a limited lesson time, the tools acted as scaffolding elements for constructing knowledge. Because it brings extra effort, they should work on constructing programming knowledge and also deal with peers or the instructors’ discussions. Accordingly, the students generally concentrated on the task related issues and they could not consider other postings in the chat or discussion postings. The findings of the current study is in accord with the findings of Gutiérrez-Santiuste et al. (2015) suggesting that the communication tools used within web conferencing system positively influenced to the perceived cognitive presences. On the other hand, Akyol and Garrison (2011) addressed that the duration of the course sometimes cannot be sufficient for students to discuss on projects or exchange knowledge. In contrast, in this study, despite the limited time of web conferencing course periods, most of the students perceived the course activities helpful.

Relationships between cognitive presence and academic achievements in web conferencing

In this study, cognitive presence scores were found moderately correlated with final exam scores. The results indicated that, the students who had higher academic achievements also had high cognitive presence scores. This finding is important because the measurement of students'
learning is based on the objective measures of achievement, not to the perceived learning of the educational experience. Considering the quality of knowledge exchanging as an indicator of cognitive presence; the current study is in agreement with the idea that students with high cognitive presences are more active in exchanging knowledge in learning communities (Garrison, Anderson, and Archer; 2001). Similarly, Öztürk (2015) found that the academic achievements are in relation with the quality of discussions in online learning. Surprisingly, the results gathered from the resolution phase of the questionnaire were relatively lower than those of other phases. One reason for this result may be that the items in this phase were generally related to the transmission of the constructed knowledge to the practice.

In this study, alongside the quantitative data, the analyses of messages were also used to discuss the correlations of the cognitive presences and academic achievements. The analysis of messages showed that the students with high academic achievement provided more quality messages. The students’ perceptions were positive that online discussions in synchronous course were useful to understand fundamental concepts and develop new perspectives. This result is in agreement with results of the findings reported by other researchers who documented that online discussions are necessarily effective in supporting critical, creative, and complex thinking skills (Kanuka & Garrison, 2004). In this sense, it may be thought that quality messages about the programming codes, structures or concepts contributed to create a collaborative climate and positively influenced the cognitive presences. This is confirmed with the findings that the contribution of quality messages to the academic achievements was higher in high academic achievement students.

Some limitations of this research study were, however, that this study utilized a group of students’ perceptions and test scores to assess the relationships between presences and academic achievements. The data is gathered from a group of undergraduate students who took an online course in a programming language course. The sample size was not large and the instructional unit was specific. So, a larger sample size would increase the sensitivity of the analysis, and different topics of other courses may offer different results. Despite all, the results about the presences through the discussions with regard to the nature of web conferencing provide some hints for evaluating the students’ presences in the synchronous system.

**Conclusion and Future Implications**

In this study, the perceived teaching, social and cognitive presences were found satisfactory or highly satisfactory. We can say that; students’ perspectives indicate that the interactions and communications in the learning activities within web conferencing can provide a sense of community of inquiry. The study revealed that students with a strong sense of cognitive presence have a high level of academic achievement. It was also noted that the role of the instructor plays a crucial role in organising the synchronous setting that triggers both social and cognitive presence. In line with this; precautions should be taken in terms of providing instructors having enough technological and pedagogical knowledge for delivering synchronous online courses via web conferencing. Since the results may not be generalizable, future research can also be repeated by increasing the sample size and with different communication media of synchronous systems.

Consequently, the developments in web conferencing suggest to interest in how to expand the CoI framework for synchronous communication. Practically, instructors should pay attention to their roles in the synchronous courses. Furthermore, in order to provide quality cognitive presences, instructional designers should be aware of the affordances of synchronous settings in which the social and cognitive cues are somewhat transformed.
References


Appendix 1. Sample Pieces from the Messages

T. “Try to use controls for storing odd numbers?”
S. “I used one control but cannot hold all of them, something is missing.”
S. “Use it after before output when the loop is finished?”
T. “So, you can share that part of your program, is yours working?”

S. “How did you use a function of approximation in your code?”
S. “I got the input then in a loop I used the function. When I calculated the results, I sent them to the main function.”

T: “Who could not use the arrays in the code?”
S. “Was it necessary, I did not use it but the program is running?”
S. “Of course, the problem begins with: “Use arrays in the code””
Correlation between familial roles and persistence of female students on distance education programmes in Ghana: Through the lens of an administrator

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Abstract
The contributions of individuals towards a nation's development cannot be underestimated. Nevertheless, research has proven that gender roles could create some setbacks to the extent that some individuals may not be able to reach the optimum in higher education. This correlational study explored whether the interplay of some female gender roles affected persistence as female students juggled with studies. A total of 21 study centres with female enrolment of a 100 and above were purposively selected. Using simple random sampling, a sample of 441 female students were drawn from two distance education institutions in Ghana. The study employed the correlational research design. A questionnaire was used to collect data and analysed using descriptive statistics and Pearson Product Moment Correlation Coefficient. It was revealed that female students had family roles they performed. The study found that there was a positive correlation between persistence and familial roles among the participants. This implied that as the level of familial roles of the respondents increased, their persistence increased as well, thus revealing some level of resilience towards the progression of their education. It was therefore recommended that administrators of distance education institutions equipped female students with the needed knowledge and support to ensure the effective management of their familial roles.

Keywords: Family roles, persistence, female students, distance education programme

Introduction
Studies have continually found that adults in general and females in particular, enter institutions of higher learning to improve on their job skills, for personal enrichment and to fulfil a desire for a lifelong education (Bhalotra & Rawlings, 2011; UNESCO, 2015). Higher education is seen as one of the most effective ways that help to shape economic returns and also determine quality of life especially among females (Gentry, 2014; Demiray, 2014). Despite these benefits, Johnson and Kposowa (2018) and Adu-Yeboah (2011) have argued that societal perception of roles of female and male roles usually affect their participation in formal education.

Traditionally, the socialization of the female in both western and African countries still demands that she takes care of the home and her family and also participates in societal activities (Igarashi & Kumo 2016; Filipponi-Berardinelli, 2013; Kwapong, 2010). In support, Hetzel (2012) also indicated that the gendered nature of women's work makes them fulfil more roles and responsibilities than their male counterparts in most parts of the world. Women are required to carry the main responsibilities of housework and raising children which sometimes affect their ability to successfully achieve their
educational goals (Foster & Offei-Ansah, 2012). Though distance education is generally seen as a mode of study which provides flexible time management possibilities suited for females, most of these females who enrol on higher education programmes through the distance education mode often possess multiple personal and professional life roles which usually impact positively or negatively on their successful persistence (Malinovski, Vasileva-Stojanovska, Jovevski, Vasileva & Trajkovik, 2015; Ross-Gordon, 2011).

Student persistence is considered an important element in open and distance education as it forms the basis of teaching and learning activities (Sauve, 1993; Gokool-Ramdoo, 2009). Thus, effective teaching and learning in distance education institutions can occur only when persistence among students is ensured. Habley, Bloom and Robbins (2012) claimed that persistence is when a student “continues to enrol at the institution after matriculation” (p.4). In other words, it is all the efforts undertaken by an individual student to remain enrolled in an institution until a degree is attained (Hagedorn as cited in Sansone, 2017; Kirkman, 2018). This definition makes persistence more of a student-centred rather than institution-centred term. Students’ persistence for this study focused on actions taken by female students to continue enrolling on a distance education programme. The aim of the study was to find out how family roles affected the persistence of female students as they access higher education through the distance education mode in selected public universities in Ghana.

**Purpose of the Study**

The purpose of this study was to find out the extent to which family roles correlated with persistence of the female students as they access higher education through distance education programmes. The findings were deemed to create the needed awareness among other female students who encountered these roles and also among administrators of distance education institutions as they formulate policies on the needs of female students. This was important because it is the belief of most managers and practitioners that the nature and flexibility of distance education makes it quite suitable for females with multiplicity of roles. This belief therefore needed to be investigated in the context of distance education programmes in Ghana. It is in the line with the above discussion that the study tried to respond to the following null hypothesis; that there is no statistically significant relationship between family roles and persistence of female students in distance education programmes in Ghana.

**Theoretical Framework**

The study was premised on the Bean and Metzner’s (1985) student attrition theory. Bean and Metzner (1985) formulated this theory drawing inferences from the organisational turnover and attitude-behaviour interactions theories. It emphasised that student intentions to remain in an institution are identical with workers’ decisions to stay in an employment or a workplace. Bean and Metzner focused on the non-traditional students in developing this theory. These students were defined using some characteristics such as age, gender, residence, and attendance. According to Bean and Metzner (1985), external factors affect non-traditional students who usually have fewer opportunities for social integration into institutions. The researchers found that environmental variables were more important for non-traditional students than academic variables (Bean & Metzner, 1985). Students were most likely to remain enrolled when environmental variables are excellent and academic variables are poor because low scores on the academic variables are usually compensated for by environmental support (Bean & Metzner, 1985). The description
given fits into the characteristics of female students in the distance education programmes at the universities under study. The familial and societal roles these female students performed were considered to form part of their external environment. This meant that if female students faced challenges as they performed their familial and societal roles, it was likely to affect the effort they made towards their academic activities and persistence. The study was therefore conducted with the aim of finding out if any relationship existed between these roles and persistence of female students so as to provide first-hand information to managers and administrators of distance education programmes in Ghana.

**Literature Review**

*Family Roles and Female Students*

Traditional gender role demands in both western and Sub-Saharan Africa nations including Ghana, make the maintenance and caring for family members the primary responsibility of females (Mrkic, Johnson & Michael, 2010). In spite of the incremental changes that have occurred in the participation of education in general, females continue to bear most of the responsibilities at home. These roles may include caring for children and other dependent household members, preparing meals and doing other housework (Mrkic et al., 2010). The study by Abuya, Ngware, Mutisya and Nyariro (2017) in Kenya found that school girls faced a myriad of obstacles as they tried to combine school with household chores and looking after younger siblings. Their school attendance was usually affected as they ended up spending more time on activities that were not related to their schoolwork (Abuya et al., 2017). Traditionally, the roles of the female do not change but rather increase as they mature in age. For instance, the women in a qualitative study by McClusky (2017) confirmed that it was customary for women to be accountable for all the family’s needs. The mother’s duties were made up of a variety of tasks which included childcare, water collection, domestic responsibilities, gathering and cooking food, taking care of the livestock, and making and mending clothing for the family (McClusky, 2017). Though modern societal and occupational trends might have brought some changes with respect to these roles (Igarashi & Kumo, 2016), but as indicated by McClusky (2017) and Kwapon (2010), some role demarcations still persist in most communities globally. For instance, studies by Zhan (2005) and Warmenhoven, Hoebink and Janssens (2018) which compared female’s and male’s family roles revealed that women generally provided personal care and help in domestic chores and also women were found to spend significantly more time on elderly care than men.

Cultural assumptions about motherhood affect females in the home, in college and at work (Spilovoy, 2013). The societal perception as seen in many western and African cultures is supported by the fact that ideally, women must become mothers (Richko, 2016). Richko further argued that though the demands of contemporary society may affect decisions on motherhood, the desire for bearing and caring for children still remains among many women. The implication is that women, who stayed unmarried or childless, were usually given some derogatory labels. This push some women to go for mothering roles as a way of avoiding demeaning remarks from the public (Richko, 2016). On the contrary, a study conducted by Mason and Goulden among female faculty in a Canadian university reported that most of the participants desired to have fewer number of children or become completely childless (as cited in Snow, 2017). Solomon (2011) further explained that the reason for this finding was the need to delay childcare in order to complete academic commitments and achieve some level of academic success as members of faculty. In support, Fluehr (2013) reiterated that the age of the children is an important
factor to consider as caring for younger children could be more demanding compared with grown-up children. For instance, a study by Home found that student mothers with children under the age of thirteen suffered from increased role strain than those with grown-up children (as cited in Fluehr, 2013). However, mothers unwillingness to give up control in childcare make their involvement with the children quite longer than fathers because most mothers tend to feel more responsible for the child’s well-being (Ogletree, 2014).

In support of the foregoing discussion, Bosch (2013) conducted a study among postgraduate student mothers in Australia using both quantitative and qualitative techniques for collecting data. The finding showed that the main challenge of the student mothers was lack of support. The participants reported overcoming this difficulty by using time-management skills, partner support, and by sacrificing sleep and recreation time. However, their roles as mothers coupled with the need to create better opportunities for their children, served as a strong motivation for achieving personal goals. Bosch (2013) concluded that undertaking a postgraduate education rewarded the student mothers with a sense of freedom, growth, pride, achievement and developed their professional identities. It can be observed that though Bosch’s study focused on postgraduate female students who had experienced a longer period of schooling, the participants reported challenges trying to combine studies and motherhood. The situations raised in the studies discussed above were not different from the roles played by females in most Ghanaian societies. In a related study, Adusah-Karikari (2008) had reiterated that traditionally, gender-role identification and household responsibilities are clearly established and passed down to children in the family. Preparing family meals, maintaining hygiene, caring for family members and a myriad of other chores consume a good part of the day for females globally no matter the level of one’s education (Mrkic et al., 2010; Sharma, 2014; Shah, 2015). The implication is that in an attempt to combine studies with domestic responsibilities, female students might find themselves in role strains as each of these responsibilities needs equal attention, time and energy. The current study proposed to find out how family roles affected the persistence of female students irrespective of their social status. This was considered important because a study conducted by Abuya et al. (2017) in Kenya revealed that domestic responsibilities affected girls who were transiting from primary to secondary schools.

**Method**

**Research design**

The study employed a correlational research design (Creswell, 2014). This design was deemed appropriate because apart from using it to determine the relationship between the variables under study, the correlation coefficient was also used as a measure of the magnitude of the effect (effect size) as recommended by the American Psychological Association (Field, 2009). In addition, the correlational research design was useful as the study focused on determining the degree of association between two variables which were not manipulated (Creswell, 2014). The correlational research design allowed the researcher to measure the magnitude of the effect between the independent and the dependent variables with the help of the coefficient of determination. The design also permitted the researcher to use questionnaire and data analysis procedures within which description and inferences could be generalised to the population of this study. Using an informed consent, participants were made aware of the purpose of the study,
assured of their confidentiality and anonymity and they were allowed to withdraw from the study at will.

**Sample and sampling procedures**

The Yamane’s formula was used to select a sample of 441 female students from a target population of 7849 from two public universities in Ghana. The female students were then selected through a stratified random sampling from 21 study centres across the country with the help of Kothari’s (2013) proportional allocation method. These study centres were purposively selected based on a criterion that they have more than 100 female students registered in them. This criterion was deemed necessary so as to enable the data collected to be subjected to inferential statistics. In addition, simple random sampling technique through the lottery method was used to allow every student within each subgroup to have an equal chance of being selected to form part of the sample (Babbie, 2015).

**Data collection and analysis procedures**

The questionnaire used for collecting data was structured and consisted of three parts. The first section looked at the demographic data (age, marital status and number of dependants). The second part dealt with the items of family roles while the third session consisted of items on persistence. These variables were measured on a continuous nature. Items on persistence were adapted from Davidson, Hall and Milligan (2009). Out of the 441 questionnaires administered, 377 were validly filled and returned for analysis, indicating an 85% return rate. The data were analysed using means and standard deviation and Pearson Moment Product Correlation Coefficient (Pearson’s r). The means of the responses were used to deduce the extent to which the respondents were in agreement with the statements under discussion on a five-point Likert scale (1-strongly disagree to 5-strongly agree). However, to facilitate data analysis, the means of the responses were interpreted as follows: 1.00 - 2.60 (Disagree), 2.61 - 3.40 (Moderately Agree) and 3.41 - 5.00 (Agree). The correlation coefficient with a significance level of 0.01 was used to determine significance of the relationship between independent and the dependent variables statistically and used to make deductions and conclusions. Pearson’s product-moment correlation coefficient was computed to determine the relationship between family responsibilities and persistence.

To calculate the effect size, the scores on family responsibilities and persistence were obtained as a continuous score and then correlated. According to Field (2009) the correlation coefficient is one of the most useful and appropriate means of calculating for effect sizes of score obtained in a continuous manner using the Pearson’s correlation coefficient $r$, because it falls between the range of 0 (no effect) and 1 (perfect effect). This was considered as a standard way of measuring the magnitude of an observed effect (Field, 2009). The effect size of the variables under study was determined using the square of the correlation coefficient ($r^2$). It helped to show the magnitude of the effect between the variables under study. Cohen’s (1994) standard on interpretation of effect size where, $r = .10$ (small effect), $r = .30$ (medium effect) and $r = .50$ (large effect) was used. An analysis of variance (ANOVA) was further used to confirm the significance of the relationship between the variables.
Findings and Discussions

Profile of Respondents

The age ranges of the participants were found to be as follows; those aged between 18-25 years were 155 (41%); 25-35 years were 193 (51%); 36-45 years were 22 (6%) while participants aged above 46 were 7 (2%). The age range with the highest number of participants was 25-35 (51%). Participants were found to fall within 3 main categories of marital status namely; single 235 (62%), married 138 (37%) divorced and widowed 4 (1%). This implied that the majority of the female students were single. The study further sought to find out if the respondents had dependants they were supporting. It was revealed that 222 (52%) of the respondents had children they were supporting, 141 (32%) and 67 (16%) cared for their parents and siblings respectively. The descriptive analysis of responses of the female students in relation to their family roles is presented in Table 1.

<table>
<thead>
<tr>
<th>Family Responsibilities</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caring for children.</td>
<td>3.9</td>
<td>1.2</td>
</tr>
<tr>
<td>Medical care to elderly</td>
<td>3.9</td>
<td>.99</td>
</tr>
<tr>
<td>Cooking for family.</td>
<td>4.2</td>
<td>1.0</td>
</tr>
<tr>
<td>Laundering for the family.</td>
<td>3.9</td>
<td>1.2</td>
</tr>
<tr>
<td>Less time for husbands.</td>
<td>3.3</td>
<td>1.3</td>
</tr>
<tr>
<td>Expecting babies as student</td>
<td>3.7</td>
<td>1.3</td>
</tr>
<tr>
<td>Nursing babies as student</td>
<td>3.9</td>
<td>1.2</td>
</tr>
</tbody>
</table>

It can be observed from Table 1 that most of respondents agreed to the issues raised on family roles as portrayed by the mean values of above 3.41. The respondents agreed (Mean=3.9, SD=1.2) that it was the duty of the female to care for children especially when they fall sick. This included taking them to seek medical care, ensuring they were well-fed and medications were properly taken. This could be really stressful when such situations coincided with times when they were supposed to attend to academic duties as well. The participants agreed it was their responsibility to care for the elderly relatives of the family (Mean=3.9, SD=1.2). This was possibly the situation because in most African communities including Ghana, where the existence of homes for old and aged relatives is practically absent, it becomes the duty of close family members to care for their aged relatives. The call for duty, as far as the care of elderly relatives was concerned, usually fell on the females as compared with males in most families even if these females were students as reported in this study. This result concurred with the assertion made by Sha’aban as cited in McClusky (2017) that in most families, females were responsible for taking care of the unemployed, the elderly and the sick.

The study went further to seek the views of respondents on performing domestic roles such as cooking and doing laundry for the family. These roles had mean values of 4.2(SD=1.0) and
3.9 (SD=1.2) respectively. This was an indication that the respondents agreed that it was their responsibility to do the cooking and washing for their families. Again, it can be noted from Table 1 that the respondents gave a confirmation to the fact that it was difficult to combine pregnancy and studying through the distance education mode. This was supported by respondents who agreed (Mean=3.7, SD=1.3) to this statement. To find out the situation on the ground as far as nursing babies and being students were concerned, the respondents agreed (Mean=3.9, SD=1.2) that it was a demanding role. This affirmed that family roles could interfere with their persistence. The implication is that combining family roles with being a student on a distance education programme could affect one’s level of persistence. These claims supported the assertion made by O’Brien and Hapgood (2012) that mothers’ “second shift” could be a cause of fatigue when females take up roles such as childcare, housework and caring for elderly family members. This was further confirmed by a survey conducted in Canada by McMaster professors which reported that there were many instances where unequal sharing of responsibilities between men and women in relation to domestic duties and childcare still occur (Yates, 2014).

The study also assessed the relationship and effect of family roles on persistence of female students on the distance education programmes. In line with this, a null hypothesis was formulated and tested as follows:

$$\text{Ho: There is no statistically significant relationship between family roles and persistence of female students in distance education programmes in Ghana.}$$

To determine the relationship, the scores on family roles and persistence were both computed individually and a continuous score was obtained for each of the variables. The Pearson’s r indicated the relationship between the independent and the dependent variable, while the results from the report on ANOVA further established the strength of the significance of the relationship between the variables understudy upon which conclusions were made. The result obtained from the correlation is as presented in Table 2.

<table>
<thead>
<tr>
<th>Family Responsibilities</th>
<th>Persistence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Responsibilities</td>
<td>Pearson Correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>Persistence</td>
<td>Pearson Correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td></td>
<td>N</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).

As seen from Table 2, there was a significant but weak positive correlation between family responsibilities and persistence, r = .177, n = 377, p = .01. Figure 1 further shows a scatterplot that summarized the result indicating a weak and positive correlation between family responsibilities
and persistence of female students on distance education programmes as most of the data points clustered around the mean.

![Figure 1: Relationship between family responsibilities and persistence of female students.](image)

This meant that an increase in family responsibilities resulted in increased persistence of female students as well. This meant that the participants were somehow challenged with family roles but they made efforts to persist as students of distance education. This might be resulting from the existing structures which seemed to be tailored in a one size fits all manner. There was no flexibility in the choice of number of course loads one can conveniently study within a semester. Female students therefore struggled to fit in the existing structures which was not too suitable for them with respect to the other roles they performed as mothers or caretakers. This finding was in agreement with the study conducted by Abuya et al. (2017) in Kenya who found that females faced a lot of obstacles as they try to combine school with household chores and caring for younger siblings. They were usually overwhelmed with domestic and family demands (Eboiyehi, Fayomi & Eboiyehi, 2016). But in contrast with the findings of Abuya et al. (2017), which indicated that attendance to school was negatively affected by family responsibilities, the participants of this study showed some persistence towards their education.

To calculate for the magnitude of the effect of family responsibility on persistence, the $r^2$ was used and this gave an effect size of .03. An effect size of .03 was an indication that family responsibilities had a small but significant effect on persistence of female students on distance education programmes as confirmed in the ANOVA results presented in Table 3.
From Table 3, $F (1, 376) = 12.107$ was significant at $p < .01$. This meant that family roles were positively related to persistence of female students. Therefore, the null hypothesis that stated that there is no statistically significant relationship between family roles and persistence of female students in distance education programmes in Ghana was rejected. The implication of this finding was that despite the fact that there was some increase in the level of family roles female students performed, their persistence increased as well as depicted in Figure 2.

Figure 2: Female student with a baby at a face-to-face session.
As seen in Figure 2, the female student has developed some resistance towards managing their roles as homemakers by carrying part of their responsibilities from home to the college. In order words, they tried to make the best out of both situations (home and college). This finding was in contrast with Bean and Metzner’s (1985) view that unfavourable environmental or home conditions were likely to affect the persistence of the non-traditional students negatively. It however confirmed the assertion made by Parker (2015) that many women have now decided to choose the joy and fulfilment that comes with a successful career and might put in all the necessary efforts to fulfil their academic goals. It can be deduced from the above discussion that most female students were determined to enjoy a better and fulfilling career and distance education provides the channel for their aims to be achieved as opined by Marsman (2014) and Kwapong (2010).

The findings on family responsibilities were also in tandem with assertion made by Richko (2016) that despite the demands of contemporary society, the desire for bearing and caring for children still remains among many women. Majority of the respondents in the study confirmed they had roles to play in the caring and maintenance of children. Although many of the female students involved in the study were single, after attaining the traditional marital age (Sweetman, 2003), there were indications that they were involved in other forms of caregiving activities (Ogletree, 2014). In summary, it was found that the female students performed familial roles as expected of them. It was further confirmed that female students seemed challenged as they combined studies and the family roles. However, despite this challenge, the female students appeared determined to persist on their course of study as confirmed by the results of the study.

Conclusions and Recommendations

Based on the findings of the study, it can be concluded that female students performed various roles in the family as expected of them. These included giving care, maintaining their homes, and expecting and nursing babies. The study found that though female students experienced some level of difficulty in performing these family responsibilities, their persistence was not affected negatively. Rather, the increased family responsibilities equally generated increased persistence among the female students which seemed to go against the usual norm as found by other researchers (Bean & Metzner, 1985; Abuya et al., 2017). This therefore implied a wake up call for the introduction of new policies by administrators and managers of distance education institutions especially in Ghana to help deal with this phenomenon so as to further improve the persistence of female students. It was therefore recommended that:

1. Administrators of distance education institutions could put in place necessary structures to help female students get supported enough to manage family roles and their persistence effectively as students on distance education programmes.
2. Administrators could be guided with the findings of the study to give practical information to female students on how to deal effectively with these equally important roles of being students and managing the family.

Limitations

The results of this study reflected the responses of female students enrolled in distance education with a face-to-face option and their responses may differ from students in other types of programmes such as online programmes. In addition, family roles as perceived by participants in this research
setting might be different in other settings, therefore generalization must be done with circumspection. The presence of a lot of unmarried female students in this study might have had some influence on the results of this study. This calls for a further study to focus on only female students with spouses and families. With a significance level of $p<.01$, and only 3.1% variance explained was an indication there were other unobserved factors affecting persistence of female students in distance education programmes in the selected institutions in Ghana.

References


Student Perceptions of Open Pedagogy: An Exploratory Study

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Abstract
With the increasing development and adoption of Open Educational Resources, many researchers and practitioners are interested in more carefully examining pedagogies connected with their use. This study describes the perceptions of 173 students of implementations of various approaches to open pedagogy by nineteen instructors in post-secondary institutions in New Hampshire. Students were asked about their perceptions of several aspects of open pedagogy, including its influence on the mastery of core academic content, skills in collaborative learning, critical thinking and problem solving, effective communication, and learning how to learn. Students found value in open pedagogy and believed that open pedagogy had greater overall educational value than traditional educational activities. When students were asked if they would prefer to take a course with open pedagogy or traditional pedagogy, a majority preferred open pedagogy. Further research is necessary to determine the efficacy of open pedagogy beyond student perceptions, and also to determine which types of open pedagogy are most efficacious.

Keywords: Open Educational Resources, OER, Open Pedagogy, OER Enabled Pedagogy
Introduction

In recent years, Open Educational Resources (OER) have had a growing influence on the discourse within education circles. The term “Open Educational Resources” comes from the 2002 UNESCO Forum on the Impact of Open Courseware for Higher Education in Developing Countries, which defined OER as follows: “The open provision of educational resources, enabled by information and communication technologies, for consultation, use and adaptation by a community of users for non-commercial purposes” (UNESCO, 2002, p. 24). Thus, a clear goal related to OER is to have free and unfettered access to educational materials, with the purpose of improving teaching and learning.

Much of the research to date has focused on the processes, opportunities, and challenges of utilizing OER (e.g., Weller, 2014), or the efficacy of OER (e.g., Hilton, 2016). Given the increasing viability of OER, some are beginning to focus more attention on pedagogies that can be used in conjunction with OER. These pedagogies, often collectively referred to as “open pedagogy” have promise; however, there remains extensive debate regarding the definition of this term or what it actually looks like in practice. While the term “open pedagogy” has a long history (discussed below) little empirical research has been done on its current instantiation as being a form of student-centered pedagogy that is often connected to OER.

In the present study, we do not attempt to provide a concrete, narrow definition of open pedagogy; however, we do attempt to quantify student perceptions of a variety of instantiations of open pedagogy. The purpose of this paper is to provide an initial investigation into how students perceive the value of open pedagogy, rather to traditional methods. We describe our methodology following a review of literature.

Review of Literature

Prior to the widespread use of internet technologies Elliott (1973) simply describes open pedagogies as being connected with leading less formal discussions and students co-creating the context. Elliott’s contemporary, Mai (1978), similarly stated that “open pedagogy” is an “informal classroom where children might be trusted to learn by exploring according to their own interests, instead of being bored, demeaned, and alienated” (p. 231). Elliott and Mai comport with the idea that “Open Pedagogy” involves trusting students to lead the learning process. Mai suggests by inference that some benefits of these attributes will be a better learning environment for students. Dufeu (1992) explains that “Open Pedagogy” enables students to determine the composition and advancement of a course according to their needs and wants. Daniel (2004) also echoes the theme of student centered education describing an open pedagogy “that treats the student as an intellectual equal” (p. 9).

In recent years, researchers have focused on connections between Internet technologies and open pedagogy. One issue sometimes raised is the importance of students creating resources that can be reused, particularly those with an open license. Another is the inclusion of internet enabled byproducts as a component of open pedagogy, and the third is that internet technologies themselves are a part of open pedagogy.

David Wiley (2013) expanded the definition of open pedagogy stating, “This is the ultimate test of whether or not a particular approach or technique can rightly be called “open pedagogy” – is it possible without the free access and 4R permissions characteristic of open educational resources? If the answer is yes, then you may have an effective educational practice but you don’t have an instance of open pedagogy (Wiley 2013).” Later, Wiley expanded that definition to include a “5th R” of open educational resources (Wiley 2014). Thus, Wiley believes that open pedagogy includes the open sourcing of student work on key dimensions such as being free to access, reuse, revise, remix,
Student Perceptions of Open Pedagogy: An Exploratory Study

redistribute, and retain. More recently, Wiley and Hilton (2018) introduce a narrower term, “OER-enabled pedagogies,” as being “the set of teaching and learning practices that are only possible or practical in the context of the 5R permissions which are characteristic of OER.”

Several authors introduce byproducts of internet technologies as part of open pedagogy. For example, Hodgkinson-Williams and Gray (2009) use open pedagogy to refer to “the opening up of educational processes...enabled by Web 2.0 technologies.” Likewise, Weller (2013) draws a similar conclusion stating that open pedagogy “makes use of...abundant, open content (such as open educational resources, videos, podcasts), but also places an emphasis on the network and the learner’s connections within it” (p. 10). DeRosa and Robison (2017) describe internet technology by-products such as OER, “as a jumping-off point for remaking our courses so that they become not just repositories for content, but platforms for learning, collaboration, and engagement with the world outside the classroom” (p. 117).

Several authors have included instantiations of Internet technologies themselves as part of the definition of open pedagogy. For example, the term open pedagogy has often been associated with student-centered approaches connected with new technologies (Hodgkinson-Williams & Gray, 2009; Mackintosh, McGreal, & Taylor, 2011; Hegarty, 2015). A 2011 white paper from Athabasca University associates open pedagogy with learning digital literacies (Day et al., 2011). Hegarty (2015) defines participatory technologies as a critical attribute of Open Pedagogy, citing Blackall (2011) who wrote, “Technically speaking it is the use of blogs; wikis; video, photo, and audio sharing sites; forums, chats, and even email, that combine into what more interestingly becomes socially constructed media” (Blackall, 2011, para. 48).

As the definition of “open pedagogy” continues to evolve, other terms, such as open educational practices can overlap the expanded definitions of open pedagogy. For example, Cronin (2017) defines as open educational practices as “a broad descriptor of practices that include the creation, use, and reuse of open educational resources (OER) as well as open pedagogies and open sharing of teaching practices.” Likewise, The Open Educational Quality Initiative (2011) defines open educational practices as

“a set of activities around instructional design and implementation of events and processes intended to support learning. They also include the creation, use and repurposing of Open Educational Resources (OER) and their adaptation to the contextual setting. They are documented in a portable format and made openly available” (p. 13).

While overlap is occurring, other definitions are creating distinctions from open pedagogy.

This brief overview demonstrates that consensus definition for open pedagogy does not yet exist. Furthermore, as internet technologies have expanded the definition of open pedagogy, it is no longer clear what does or does not constitute open pedagogy. Notwithstanding this lack of consensus, many proponents of various forms of open pedagogy have postulated or asserted that students will find value in it. However, we are not aware of any published study that measures student perceptions of instantiations of open pedagogy. The purpose of the present study is to begin to address this large gap in the literature. We seek to answer the following question: What do students perceive to be the educational value of open pedagogy, broadly defined, relative to traditional teaching approaches?

Method

During the 2017-2018 school year, nineteen instructors in The University System of New Hampshire (USNH) participated in an Academic Technology Institute (ATI) and in connection with this experience
chose to begin or continue a focus on open pedagogy. For the purposes of this project, the ATI defined open pedagogy as embodying four common principles:

- Focuses on access, broadly conceived;
- Emphasizes learner-driven curricula and educational structures;
- Stresses community and collaboration over content;
- Sees the university in the context of a wider public.

Given this broader definition of open pedagogy, a variety of approaches were involved. For example, students in some classes used OER-enabled pedagogies, such as revising an open textbook or creating quiz banks for OER (Wiley & Hilton, 2018). Other instructors adopted a broader version of open pedagogy and had their students create the syllabus, learning outcomes, assignments, rubrics and/or class structures (with varying degrees of instructor guidance). Others focused on students participating openly in class by posting responses or assignments on blogs or social media. At the end of the semester, students in each of these classes were given a survey regarding their experiences with the open pedagogy of the course (see Appendix for the survey).

**Student Surveys: Perceptions of Open Pedagogy**

*The Educational Value of Open Pedagogy*

A total of 173 students responded to survey questions regarding their learning experiences with open pedagogies (the total number of survey responses varied by question since students were not required to respond). Students answered questions like the following: “How did [insert open pedagogy assignment] help you [insert key learning outcome], compared to the way engaging in traditional learning activities (like writing essays or taking quizzes) would have?” Each question was personalized based on the open pedagogy assignment utilized in each specific class, and tailored based on a series of key learning outcomes. For example, “How did writing blog posts help you master core academic content, compared to the way engaging in traditional learning activities (like writing essays or taking quizzes) would have?” These key learning outcomes were selected by the researchers, and not necessarily specific to the course.

Student responses to these questions are summarized in Table 1.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Greater with Open Pedagogy compared with traditional activities</th>
<th>Same with Open Pedagogy compared with traditional activities</th>
<th>Less with Open Pedagogy compared with traditional activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mastery of core academic content</td>
<td>79 (47%)</td>
<td>66 (40%)</td>
<td>21 (13%)</td>
</tr>
<tr>
<td>Skills in collaborative learning</td>
<td>80 (48%)</td>
<td>76 (46%)</td>
<td>10 (6%)</td>
</tr>
<tr>
<td>Critical thinking and problem solving</td>
<td>74 (45%)</td>
<td>83 (50%)</td>
<td>9 (5%)</td>
</tr>
<tr>
<td>Effective communication</td>
<td>62 (38%)</td>
<td>91 (55%)</td>
<td>12 (7%)</td>
</tr>
<tr>
<td>Learning how to learn</td>
<td>60 (37%)</td>
<td>90 (56%)</td>
<td>10 (7%)</td>
</tr>
<tr>
<td>Aggregate Learning Outcomes</td>
<td>43%</td>
<td>49%</td>
<td>8%</td>
</tr>
</tbody>
</table>

*Open Praxis*, vol. 11 issue 3, July–September 2019, pp. 275–288
When directly asked to compare the overall educational value of open pedagogy versus traditional classroom activities, a majority of the 173 students who responded favored open pedagogy. In total 53% said open pedagogy had greater educational value than traditional learning activities. An additional 31% viewed both activities as having equal educational value and a minority (16%) felt that the educational value of open pedagogy was lower than that of traditional activities.

Those who felt that open pedagogy had greater educational value indicated that it led to increased knowledge of the material. For example, one student reported, “It allowed me to look through important course information, such as cases and related legal information, and synthesize it for the audience (my blog). This forced me to think of the information in terms of its importance relative to my topic and use it in a way that was meaningful to an audience that may not have the context to digest a lot of raw information. A traditional tool, like a test or quiz, would not achieve this same level of cognitive rigor in terms of how I used the course material.” Another student wrote, “It really made you have to think about the material and understand it before publishing something that others would read and see. You want to make sure the information is correct, and [that] you are correct in what you are saying.”

Many students also valued the open pedagogy because they found it to be more engaging and relevant in their lives. One wrote, “I felt that this approach was much better than traditional quizzes and tests because it was a new way for me to demonstrate my learning and understanding of my research topic.” Another student said, “It was more hands-on. It didn’t feel like ‘traditional’ learning. Rather, it was more interactive and felt more ‘life-like’ enabling me to learn the material, while also gaining real life skills.

Students also appreciated the personalization afforded by open pedagogy. One student said, “I was actually able to retain information due to applying the concepts to real world issues and writing something I was passionate about. This was more helpful than being worried about cramming for an exam to get a good [grade] and then forgetting all the information after.” Another wrote, “By allowing students to have a hand in the construction of the course, we were given a sense of agency in our education. I feel as though this made us more invested in the assignments and in the material we discussed.”

Those students who felt the educational value of open pedagogy was less than traditional learning activities tended to feel there was a lack of structure. One student said, “Nothing is set in stone and I am unaware of what to prioritize and what the goals of the class are.” Another wrote that there was “less structure” which made it “easier to get distracted and not get work done.”

Some students seemed to struggle with the technology aspect involved in specific open pedagogy assignments, such as creating a blog. One wrote, “I do not really understand how to format my page. This has made it difficult since that is the main aspect of this project.” Another said, “It offered no education value at all unless I wanted to go into media or marketing then perhaps it is useful to know how to create a website.” In some cases, students simply preferred traditional activities. One wrote, “I didn’t get as much from this style of learning. I would rather take quizzes and exams to test what I know.”

**Student Perceptions of Open Pedagogy and Learning Outcomes**

Students were asked, “Suppose that certain types of learning activities lead to certain learning outcomes. For example, reviewing flash cards might lead to memorizing facts. What types of learning outcomes do you think are the result of [insert specific open pedagogy used in the class]?” A total of 136 students described their perception of the learning outcomes of open pedagogy.
The largest category of their response clustered around responses related to deeper learning. One student said that open pedagogy required “Synthesizing multiple ideas and information”; another stated that open pedagogy provided a “deeper understanding of the topics covered in the course.” In total, 45 responses (33%) had similar descriptions of the learning outcomes. Other representative responses include the following: “Learning how to use facts and organize information to learn rather than just trying to absorb information and spit it out,” and “By spending a good chunk of your time writing a blog about a certain phylum for example, you research about them and learn so much. By paraphrasing articles for your blogs, you have to think about what your reading and how you can get the point across. I think this is more effective than just memorizing flash cards.”

Students also identified increasing student interest/engagement in a topic or course (mentioned by 24% of respondents) and learning real-world applications (23%) as important learning outcomes of open pedagogy. With respect to increasing interest, one student wrote, “People are more interested in what they are learning if they have a say in what they learn about.” Another responded, “You’re more involved as a student because you’re allowed to take control of your education.” Regarding real-world applications, one student stated that open pedagogy made it easier to “apply the information to the real world.” Another said, “It leads to a more well-rounded understanding of the particular subject. Rather than just memorizing terms, we are learning a real issue in our world and using our knowledge to solve or complete whatever task is given.”

Only five respondents (4%) provided learning outcomes that could be viewed as negative. For example, one student wrote that there was no learning because students were creating all of the learning materials so “they are horrible and probably wrong.” While certainly a minority view, it is important to note that some students struggled with more authority for directing learning being given to the students.

Changing Opinions of Instructors

Approximately 30% (51/171) of students who answered a question about whether their opinions of their instructors changed when open pedagogy was introduced said that their perceptions of faculty members did change. Of the forty-nine students who provided a description of how their perception of the instructor changed when open pedagogy was introduced, thirteen (27%) wrote about feeling that the faculty member was more aware of their needs. For example, one student wrote, “I felt as though the instructor wanted us to create a course that we would enjoy, so it made me appreciate the professor more. It would have been easier for the professor to just call all the shots, but instead, they allowed us to determine what we would actually be working toward on a day-by-day basis. That control is one of the best feelings I’ve had as a student.” Another student responded, “It made clear that the instructor expected us to make use of the material and engage with others related to that material versus simply memorizing or gaining a surface-level understanding.” It is interesting to note that although only six students (12%) reported a negative change in opinion about the professor, some who did so identified the same attribute (instructor giving more agency to students) but viewed it negatively. One student wrote, “I felt we were doing her job.”

Fourteen students (29%) viewed the instructor as being more open-minded and relaxed about the education process. A representative comment of this cohort of students was, “I thought that the instructor was very forward thinking and adaptable which is very valuable as a professor.”

Another student said, "I noticed my instructor was a lot more involved with her students and more open minded."

**Future Courses and Open Pedagogy**

A total of 169 students responded to this question: “Imagine a future course you are required to take. If two different sections of this course were offered by the same instructor during equally desirable time slots, but one section had traditional learning activities (such as writing papers and taking tests), and the other used open pedagogy activities like you used in your class, in which section would you prefer to enroll?” In response, 52.7% preferred open pedagogy, 27.8% expressed no preference and 19.5% chose traditional learning activities.

An analysis of the comments from the twenty-seven students who provided an explanation of why they preferred traditional learning activities, two key themes emerged. First, many students felt that traditional activities were more familiar, and therefore more beneficial. One student wrote, “It’s something I’m used to, also, I’m better at listening than taking most responsibilities in my own hands.” Another student said, “I know how to answer questions in [traditional] classes and I feel I can get a better understanding for the material that way.” A second theme involved a feeling that traditional learning activities were more effective. A student stated that with traditional activities, “I would get the help I need as a special needs student,” implying that s/he did not get help expected. Another student stated that the “Traditional way makes you think and learn more even though it’s a lot harder.” Although these students expressed a minority viewpoint, their words indicate that some population of students will require more help and support than was present in the current iterations of open pedagogy that were utilized.

In contrast, three themes were highlighted by the eighty-two students who provided an explanation of why they preferred open pedagogy. First, students valued the ability to take ownership of their learning in creative ways. One student said, “I feel like I own my education more in this class option than the other.” Another responded, “I think it is a lot more beneficial for the students because we get to decide how our education is being controlled.” A second theme that emerged concerned feeling that open pedagogy was more enjoyable and less stressful. Representative comments included, “They are more enjoyable,” “It is more individualized and less stressful. There are not huge standards that induce anxiety,” and “It’s less stressful and a lot more fun.” The third theme involved deeper learning. One student wrote that open pedagogy activities “help the material stick. I probably couldn’t tell you exactly what I learned last semester in physics, but I could tell you many things from my [current science course] because we were able to take the time and learn about things we were interested in and learn it in depth.” Using similar words, another student wrote, “I feel like I learn more with open pedagogy activities. I learn actual real life situations! They "stick" better in my mind, rather than traditional memorization activities.”

**Use of Open Licenses**

One potentially problematic aspect of open pedagogy concerns the ethics of requiring, or even strongly encouraging, students to use open licenses with whatever resources they create (figure 1). Out of the 156 students who responded to a question about whether they created resources that were shared online or intended for reuse by others in the future, 93 (60%) said yes. Roughly one-third of these content-creators reported using an open license to license any of the work they created in the course. Across all students who created resources for class, 7% of students said that they felt pressured to license their work in a specific way.
One student explained the coercion that was experienced: “I felt that since my class was open pedagogy I had to license my work so that others would be free to use it in any way they wish to. While I understand the reasons behind doing this, I felt like it was something that my class was expected to do even though it was optional.” Another student expressed concern about being asked to openly publish class work stating, “Everyone could see them and I didn’t know if they were right.” While this appears to have affected a small minority of students, it highlights an important issue for faculty members using open pedagogy to be aware of.

Discussion

A majority of students (53%) said open pedagogy had greater educational value than traditional learning activities. An additional 31% viewed both activities as having equal educational value and a minority (16%) felt that that the educational value of open pedagogy was lower than that of traditional activities. Factors such as increased knowledge, relevance, and personalization seemed to drive the preference for open pedagogy. While only 30% of students changed their opinions about their instructors based on the pedagogy used, for those who did the change was overwhelmingly positive.

Notwithstanding the general positive opinions, it is important to note that a minority of students (20%) stated that they would prefer to be in classes that used traditional pedagogy and 16% of students felt the educational value of open pedagogy was lower than traditional pedagogy. These students appear to desire more structure in their course and may have struggled with aspects of open pedagogy related to technology. In addition, a minority of students (7%) felt pressured to license their work in a specific way. While these numbers clearly do not represent a majority perspective, they are important to keep in mind when creating courses that utilize open pedagogy.

Limitations and Future Research

This study represents an important initial step in quantifying student perceptions of open pedagogy; however, it has many limitations. First, as explained in the Method section, this study focused on
a broad definition of open pedagogy, allowing for many different types of approaches. This has the significant disadvantage of making it very difficult to compare this empirical study to future studies of open pedagogy. Future research should focus on a more limited set of pedagogies (preferably one instantiation of open pedagogy) to better inform what is being actual measured by the students.

An important limitation in the present study may be found in the fact that our survey questions utilize what could be considered the value-laden terms “open” and “traditional.” While “open” and “traditional” were presented in neutral ways in the survey as descriptors of assignments, it is possible that the research instrument has an inherent bias, thus limiting to value of the overall results. Furthermore, it is not clear what students have in mind when they hear “traditional” assignments. Many of the student quotes make it clear that they viewed “tests” as the alternative option. Perhaps if they had viewed “Essays” or “Group projects,” which are not exclusive to open pedagogy they would have altered their rankings.

An additional limitation is that these classes were for the most part quite small. Additional research could focus on open pedagogy in larger classrooms. More significantly, the present study is limited in that it focused solely on student perceptions. Further research is needed to examine the actual efficacy of the open pedagogy, to learn what educational impact it had. Moreover, additional studies should examine how faculty members viewed their experiences with open pedagogy, including the amount of time they needed to spend, and their assessments of student learning. Although this study is certainly not conclusive, the fact that the most students in the present study felt that open pedagogy was as good as or better than traditional teaching techniques suggests that at a minimum, open pedagogy has promise.

References


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Appendix: Survey Taken by Students

The following are general questions related to you and your courses at the college.

Q1. How many terms/semesters have you completed in college?

- Less than 1 (1)
- 1-2 (2)
- 3-4 (3)
- 5-6 (4)
- 7-8 (5)
- 9-10 (6)
- More than 10 (7)

Q2. What is your cumulative college Grade Point Average (GPA) on a 4.0 scale?

- 0.0 - 1.4 (1)
- 1.5 - 2.0 (2)
- 2.1 - 2.5 (3)
- 2.6 - 3.0 (4)
- 3.1 - 3.5 (5)
- 3.6 - 4.0 (6)
- This is my first term (7)
- I don't know

Q3. In general, how often do you rent the required course materials for the courses you take?

- Never (1)
- Rarely (2)
- About Half the Time (3)
- Often (4)
- Always (5)

Q4. In general, how often do you purchase the required course materials for the courses you take?

- Never (1)
- Rarely (2)
- About Half the Time (3)
- Often (4)
- Always (5)

Q5. Have you ever not purchased course materials for a class because of the cost of the course materials?

- a. No
- b. Yes

Q6. (If yes to 5) Do you think that not purchasing the course materials influenced your grade in the course in a negative way?

- a. No
- b. Yes

Q7. (If yes to 5) Has not purchasing course materials contributed to your decision to drop a course?

- a. No
- b. Yes
Q8. (If yes to 5) Has not purchasing course materials ever caused you to fail or withdraw from a course?
  a. No
  b. Yes

Q9. Have you ever delayed purchasing course materials for a class because the cost of the course materials?
  a. No
  b. Yes

Q10. (if yes to 9) Do you think that delaying purchasing the course materials influenced your grade in a negative way?
  a. No
  b. Yes

Q11. Have you ever registered for fewer courses because of course materials costs?
  a. No
  b. Yes

Q12. Have you ever not registered for a specific section of a course because of course materials costs?
  a. No
  b. Yes

Your instructor included the following open pedagogy activity in your course: [insert open pedagogy phrase]. The following questions relate to your participation in the course’s [insert open pedagogy phrase] in which [insert description of open pedagogy used]. In the questions below this is referred to as “the course’s [insert open pedagogy phrase].”

Q13. Have you ever completed an assignment similar to participating in the course’s [insert open pedagogy phrase] in another class?

Q14. Was the educational value of participating in the course’s [insert open pedagogy phrase] BETTER, WORSE, or the SAME AS that of traditional learning activities (e.g., writing papers, taking quizzes, etc.).
  A. Better
  B. Same
  C. Worse

14.1 [if Better in 14] in what ways was it better?
14.2 [if Same in 14] in what ways was it the same?
14.3 [if Worse in 14] in what ways was it worse?

Q15. When your instructor asked you to participate in the course’s [insert open pedagogy phrase], did this change your opinion of your instructor?
  a. Yes
  b. No

Q16. [if yes to 15] How did your perception of your instructor change?

Q17. Suppose that certain types of learning activities lead to certain learning outcomes. For example, reviewing flash cards might lead to memorizing facts. What types of learning outcomes do you think are the result of participating in the course’s [insert open pedagogy phrase]?
Q18. Imagine a future course you are required to take. If two different sections of this course were offered by the same instructor during equally desirable time slots, but one section had traditional learning activities (such as writing papers and taking tests), and the other used learning activities like participating in the course’s [insert open pedagogy phrase], in which section would you prefer to enroll?

- I would enroll in the section with TRADITIONAL LEARNING ACTIVITIES
- I would enroll in the section with ACTIVITIES LIKE PARTICIPATING IN AN [insert open pedagogy phrase]
- I would have no preference

Q18.1. [if TRADITIONAL] Why would you choose a class with traditional learning activities?

Q18.2. [if ACTIVITIES LIKE PARTICIPATING IN AN [insert open pedagogy phrase]] Why would you choose a class with activities like participating in [insert open pedagogy phrase]?

Q19. In this course, did you create any resources that were shared online or intended for reuse by others in the future?

Q19.1. (if Yes to Q19) Did you use an open license, like a Creative Commons license, to license any of the resources you created for this course?

- Yes
- No

Q19.2. (if Yes to Q19) Did you feel pressured to license your work in a certain way?

- Yes
- No

Q19.3. (if Yes to Q19.2) Please share how you felt pressured to license your work and how this impacted you.

Q20. How did participating in the course’s [insert open pedagogy phrase] help you master core academic content, compared to the way engaging in traditional learning activities (like writing essays or taking quizzes) would have?

- Participating in the course’s [insert open pedagogy phrase] helped me master MORE core academic content than traditional learning activities would have
- Participating in the course’s [insert open pedagogy phrase] helped me master THE SAME AMOUNT of core academic content as traditional learning activities would have
- Participating in the course’s [insert open pedagogy phrase] helped me master LESS core academic content than traditional learning activities would have

20.1. [If more] – Why did participating in the course’s [insert open pedagogy phrase] help you master MORE core academic content than traditional learning activities would have?

20.2. [if less] – Why did participating in the course’s [insert open pedagogy phrase] help you master LESS core academic content than traditional learning activities would have?

Q21. Reflect on the collaborative nature of the [insert open pedagogy phrase]. Select one of the following:

- Participating in the course’s [insert open pedagogy phrase] helped me become a MORE collaborative learner than traditional learning activities would have
- Participating in the course’s [insert open pedagogy phrase] helped me collaborate with other learners THE SAME AMOUNT that traditional learning activities would have
- Participating in the course’s [insert open pedagogy phrase] helped me become a LESS collaborative learner than traditional learning activities would have
21.1. [If more] – Why did participating in the course’s [insert open pedagogy phrase] help you become a MORE collaborative learner than traditional learning activities would have?

21.2. [If less] – Why did participating in the course’s [insert open pedagogy phrase] help you become a LESS collaborative learner than traditional learning activities would have

Q.22. Reflect on how the [insert open pedagogy phrase] helped you learn to think critically or solve complex problems. Select one of the following:

- Participating in the course’s [insert open pedagogy phrase] helped me become a MORE critical thinker and better problem solver than traditional learning activities would have
- Participating in the course’s [insert open pedagogy phrase] helped my critical thinking or problem solving skills THE SAME AMOUNT that traditional learning activities would have
- Participating in the course’s [insert open pedagogy phrase] helped me become a LESS critical thinker and worse problem solver than traditional learning activities would have

22.1. [If more] – Why did participating in the course’s [insert open pedagogy phrase] help you learn to think critically or solve complex problems MORE than traditional learning activities would have?

22.2. [If less] – Why did participating in the course’s [insert open pedagogy phrase] help you learn to think critically or solve complex problems LESS than traditional learning activities would have?

Q.23. Reflect on how the [insert open pedagogy phrase] helped you learn to communicate effectively. Select one of the following:

- Participating in the course’s [insert open pedagogy phrase] helped me become a MORE effective communicator than traditional learning activities would have
- Participating in the course’s [insert open pedagogy phrase] helped my critical thinking or problem solving skills THE SAME AMOUNT that traditional learning activities would have
- Participating in the course’s [insert open pedagogy phrase] helped me become a LESS critical thinker and worse problem solver than traditional learning activities would have

23.1. [If more] – Why did participating in the course’s [insert open pedagogy phrase] help you become a MORE effective communicator than traditional learning activities would have?

23.2. [If less] – Why did participating in the course’s [insert open pedagogy phrase] help you become a LESS effective communicator than traditional learning activities would have?

Q.24. Reflect on how the [insert open pedagogy phrase] helped you learn more effectively. Select one of the following:

- Participating in the course’s [insert open pedagogy phrase] helped me learn MORE effectively than traditional learning activities would have
- Participating in the course’s [insert open pedagogy phrase] helped me learn THE SAME AMOUNT that traditional learning activities would have
- Participating in the course’s [insert open pedagogy phrase] helped me learn LESS effectively than traditional learning activities would have

24.1. [If more] – Why did participating in the course’s [insert open pedagogy phrase] help you learn MORE effectively than traditional learning activities would have?

24.2. [If less] – Why did participating in the course’s [insert open pedagogy phrase] help you learn LESS effectively than traditional learning activities would have?
OER Mainstreaming in Cameroon: Perceptions and Barriers

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Abstract
The government of Cameroon has been increasingly pre-occupied with the quality of learning outcomes and the lack of learning resources at all levels of the education system. Research on similar educational systems in Sub-Saharan Africa and beyond indicate that Ministries of Education are exploring the potential of open educational resources (OER) to cut down the high cost of textbooks and enhance the availability of quality learning materials in classrooms. To explore possibilities of mainstreaming OER under the Ministries of Basic and Secondary Education in Cameroon, a quantitative research design approach was used to survey n=393 Regional Pedagogic Supervisors from the 10 Regions of the country. The outcome of this study presents the factors shaping the perspectives of Regional Pedagogic Supervisors in terms of perceptions and barriers to using OER. The novelty of this approach is the application of a proven model for technology acceptance testing in the context of OER. Based on the findings, three major recommendations for mainstreaming OER in Cameroon with potential impact on lowering textbook costs and increasing learning outcomes were formulated.

Keywords: open educational resources, OER, Cameroon, textbook costs, learning outcomes, OER mainstreaming

Introduction
In recent years, the government of Cameroon has been increasingly pre-occupied with the quality of learning outcomes at all levels of the educational system. In 2018, the World Bank Cameroon Education Reform Support Project revealed that the country would not achieve universal primary education at 100% by 2020 as outlined in the Education and Training Sector Strategy Paper for 2013-2020 (Republic of Cameroon, 2013). There were two reasons advanced for this as follows: (a) that the Primary Completion Rate (PCR) scorecard witnessed only a two percentage point increase from 74.2% to 76.3% over a period of two years – 2013 to 2015; and (b) that assessment of learning achievement in the domain of reading and mathematics for Class 5 learners show a decrease of about 4 points in the average mathematics score and 12 points in the average Reading score between 1996 and 2005 (World Bank, 2016). These findings were further confirmed by the results of a 2017 study on learning achievement conducted by the Government of Cameroon. The findings revealed that more than 50% of learners were not able to demonstrate the expected competencies in Reading and Mathematics (Ministry of Basic Education, 2018).

Besides the lack of adaptable instructional strategies for literacy and numeracy, the lack of learning resources has also been identified to adversely affect learning outcomes across the school curriculum (UNESCO Institute for Statistics, 2010; UNESCO, 2017a; World Bank, 2018). Textbooks are exceedingly relevant resources that can enhance learning outcomes, promote inclusiveness
in education and promote lifelong learning especially in large class sizes where, very often, there is insufficient instructional time. Instructional resources are strategic in the enhancement of quality learning outcomes prompting governments to allocate sufficient funds for textbooks (Global Education Monitoring Report, 2016). The World Bank (2018, p.15) observed that between the period 2010 and 2016, Cameroon “allocated on average, 14.2% of her public investment budget to education which is more than 5% below the GPE benchmark of 20% to the education sector”. Similarly, less than 1% of this education budget was allocated for the purchase of pedagogic materials in 2017 (Republic of Cameroon, 2017a; 2017b).

A comparative study from 15 African countries revealed that state average investment budget on instructional materials stood at 6.6% in the primary school sector and 5% in the secondary school sector (UNESCO Institute for Statistics, 2011). Consequently, the Cameroon World Bank (2018) commented that:

the textbooks-to-learner ratio in Cameroon is among the lowest in the world, with an average of one textbook per 12 learners, falling to one textbook per 30 students in some regions. The primary causes of low textbook-to-learner ratios are (a) the high cost of textbooks (incurred mainly by families), (b) the limited availability of textbooks outside the major cities, and (c) the poor quality of textbooks (in terms of content and materials). These challenges are largely associated with weaknesses in the national textbook policy framework and weak overall management of the textbook development and supply chain (p. 15).

Open Educational Resources

From a global perspective, Open Educational Resources (OER) are defined as instructional resources that include books, specialised software and many other materials shared under an open intellectual property license (Ozdemir & Bonk, 2017; Hilton, Wiley, Stein, & Johnson, 2010; Chen & Panda, 2013). The Ljubljana Action Plan perceives OER as a means:

Toward the realization of inclusive Knowledge Societies, Open Educational Resources (OER) support quality education that is equitable, inclusive, open and participatory. OER are 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. Open licensing is built within the framework of intellectual property rights as defined by relevant international conventions to respect the authorship of work. OER are a strategic opportunity to improve knowledge sharing, capacity building and universal access to quality learning and teaching resources (UNESCO, 2017b, p. 1).

The concept of “Open” in the definition should not be perceived as a broadly loose resource per se but rather conceived as a water tap regulator with varying degrees of “openness” (Hilton et al., 2010). Based on this perception, the manipulation of any OER by a user is guided by the Creative Common Licences affixed on the resources (Johnson, Adams Becker, Estrada & Freeman, 2014). The degree of manipulation is characterised by the 5Rs framework - Retain, Reuse, Revise, Remix, and Redistribute (Wiley, 2015).

In general, OER are found online in freely accessible repositories. Due to the vibrant nature of the creative commons community, committed members develop and share OER through web-based repositories on a regular basis (Willems & Bos, 2012). The open community perceives openness and sharing as its key values, which as part of an institutional strategy could enhance quality learning outcomes and outreach (Panda & Santosh, 2017). Furthermore, the act of sharing free of charge provides learners access to high quality education materials enhancing their learning outcomes.
These initiatives are greatly supported by UNESCO and the Commonwealth of Learning (COL) who believe that “universal access to high quality education is key to peace building, sustainable social and economic development, and intercultural dialogue” (Ozdemir & Bonk, 2017, p. 1).

Ministries of Education around the world are progressively adopting OER as a means of enhancing learning outcomes and cutting down high cost of instructional materials (Nkwenti, 2017; Abeywardena, Uys & Fifita, 2019; Karunanayaka, 2016; Tladi, 2016). In addition to this commitment, many initiatives have been undertaken (Wang & Zhao, 2011; Fiji Ministry of Education, Heritage and Arts, 2016). Many studies have also been conducted on best practices for diffusion and adoption of OER in developing countries (Conrad, Mackintosh, McGreal, Murphy & Witthaus, 2013; McGreal, Kinuthia & Marshall, 2013; Wolfenden, Buckler & Keraro, 2012). A study designed to investigate the influential factors in the use of OER by adult learners in Korea concluded that both perceived ease of use and perceived usefulness significantly influenced their behavioural intention (Kim, Lee, Lee & Shon, 2015). Similarly, a study conducted to assess teaching experience on faculty members’ perceptions about the attributes of OER concluded that a majority of the staff were willing to share their educational resources. However, they lack the experience to develop and use OER (Zhang & Li, 2017; Phalachandra & Abeywardena, 2016). Another study investigating staff skills in using OER concluded that they were willing to engage in OER even though they had limited awareness, skills and competencies in the creation, integration and use of OER (Muganda, Samzugì & Mallinson, 2016). On the other hand, a study carried out on teachers’ awareness of copyright issues reported that they had difficulties in interpreting them and this hindered them from using OER efficiently (Veletsianos, 2015). The need for teachers to be empowered with OER skills was found as an enabler to their adoption and use of the resources in the study by Pantò and Comas-Quinn (2013). Regarding teachers’ attitudes towards sharing of knowledge and learning resources, some researchers concluded that they were very positive (Rolfe, 2012; Panda & Santosh, 2017). Further, the researchers perceived the sharing of their resources as a means of enhancing their reputation and the visibility of their institution.

**Commonwealth of Learning**

COL is an intergovernmental organization created by Commonwealth Heads of Government to promote the development and sharing of open learning and distance education knowledge, resources, and technologies. Hosted by the Government of Canada and headquartered in Burnaby, British Columbia, Canada, COL is the world’s only intergovernmental organization solely concerned with the promotion and development of distance education and open learning. COL actively helps developing nations improve access to quality education and training (Commonwealth of Learning, 2018).

Owing to the challenges of textbook provision faced by Cameroon’s Ministries of Education, the adoption and implementation of OER in basic and secondary education sectors is highly imperative. Responding to the need, COL funded a nationwide sensitisation and advocacy campaign in 2016 (Figure 1) targeting Pedagogic Supervisors of the Ministries of Basic and Secondary Education. These were targeted because they regularly interact with teachers, supervising the quality of teaching and learning in their classrooms (Abeywardena, Karunanayaka, Nkwenti, & Tladi, 2018). As key actors in the educational system, they were assumed to be in the best position to contribute in the mainstreaming of OER into the instructional process in Cameroon. However, the effective adoption or acceptance of innovative practices in education has always met with some resistance on the part of the targeted population who are not always disposed to embrace change (Oppenheimer, 2003; Kiraz & Ozdemir, 2006). With this challenge in mind, we identified the need to investigate their perception and acceptance of OER within the instructional processes following COL’s intervention in 2016.
This study contributes in identifying the perceived usefulness of OER; perceived ease of use of OER; barriers to the use of OER; attitudes towards OER; and behavioural intention to use OER within the context of Basic and Secondary Education in Cameroon. The novelty of our approach is the application of a proven model for technology acceptance testing to the context of OER. Based on our findings, we make three major recommendations for mainstreaming OER in Cameroon with potential impact on lowering textbook costs and increasing learning outcomes.

Methodology

The Framework

The introduction of a new technology into the instructional process may sometimes encounter great resistance from beneficiaries (Kamel, 2004). The resistance may stem from stakeholders who perceive the use of the tool as being too demanding in terms of cost, time and energy (McIntosh, 2010). In order to map the factors that affect users’ perception and use of technology in the teaching and learning process, the Technology Acceptance Model (TAM) was developed (Davis, Bagozzi, & Warshaw, 1986) as shown in Figure 2. TAM predicts the acceptability of a tool and identifies the modifications that must be made to the system in order to make it acceptable by users. From this standpoint, TAM further suggests that the acceptability of a technology is determined by two main factors which are (a) perceived usefulness; and (b) perceived ease of use. Since the release of TAM in 1989, many researchers have used it to investigate the acceptance and innovative use of technology in different fields (Kim et al., 2015; Zhang & Li, 2017; Muganda et al., 2016).
Adopting TAM in our work, we determine an individual’s attitude towards the adoption of OER in instructional processes using (a) perceived usefulness; and (b) perceived ease of use. Perceived usefulness is the degree to which an individual believes that using a particular OER would enhance his or her productivity in instructional processes. The perceived ease of use refers to the degree in which an individual believes that using a particular OER would be free of effort. However, perceived usefulness and perceived ease of use can be influenced by external factors regarded in this study as barriers to use OER. A researcher opines that barriers could include an individual’s skill needs and situational factors that can indirectly influence their usage of a new technology in instructional processes (Röcker, 2009). According to Muganda et al. (2016), these variables include (a) difficulties in finding relevant OER; (b) limited or no Internet connection to access OER; (c) lack of computer skills to search for OER; (d) lack of knowledge of the different licenses; and (e) lack of support from the ministry to use OER. On the other hand, an individual attitude is hypothesized to influence the behavioural intention, which, in turn, determines the actual use of OER.

**Research design**

This study adopts the quantitative research design approach to survey Regional Pedagogic Supervisors’ views on factors that will shape perspectives to mainstream open educational resources in schools. The study involved a sample of Regional Pedagogic Supervisors from the Regional Delegations of Basic and Secondary Education. The Simple Random Sampling Technique (Amin, 2005) was used to select a total of n=393 pedagogic supervisors from the 10 Regions of Cameroon to participate in the study.

The instruments consist of questionnaires designed to collect data on participants’ demographic information, external factors, perceived usefulness, perceived ease of use, attitude towards the use of OER, and behavioural intention to use OER. The questionnaires were framed based on the TAM. The research instrument consists of two main sections. The first section incorporates a nominal scale to identify participants’ demographic information in two items, notably gender and age range. The second section uses a 5-point Likert scale ranging from 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, and 5=Strongly Agree to investigate participants’ opinion on the conceptual framework for the study. To ascertain the reliability of the instruments, the questionnaire was pre-tested with those not taking part in the study. Further, a reliability analysis was conducted to estimate a reasonable level of reliability and internal consistency using Cronbach’s Alpha test. Cronbach’s Alpha recommends that scales should exceed cut-off value of 0.70 (Schmitt, 1996). Based on this scale, each computed test item was above 0.70 and the TAM construction appears to have a good degree of reliability as shown in Table 2.
The survey instruments were administered to the participants after a one-year nationwide workshop conducted to sensitise the regional pedagogic supervisors on the potentials of OER as a sustainable strategy to cut down the high cost of textbooks for both teachers and learners while enhancing learning outcomes (Abeywardena et al., 2018).

**Results**

The data was coded and entered into SPSS for descriptive analysis. The participants' profiles and their Ministry of origin were analysed using frequency and percentage. Participants' perception of external factors, perceived ease of use, perceived usefulness, attitude and behavioural intention measured using a 5-point Likert Scale were analysed in terms of frequency counts, percentages, mean and standard deviation leading to interpretation based on the objective of this study.

At the end of the data collection process, the expected number of participants was not achieved. The targeted number of participants was $n=393$ but $n=322$ responded giving a response rate of 81.93%. Figure 3 indicates the number of participants per Ministerial Department. The disparity in the number of participants from each ministry is based on the fact that there are institutionally more Regional Pedagogic Supervisors in the Ministry of Secondary Education than in the Ministry of Basic Education.

![Figure 3: Number of Participants per Ministerial Department.](image)

Table 1 indicates that a majority of the participants 193 (59.9%) were males while 129 (40.1%) were females. Of this number, 270 (83.9%) were more than 41 years old while 35 (10.9%) were in their mid-thirties. On the other hand, a majority of the participants had worked for more than 16 years with 68 (21.1%) having worked for more than 26 years. This data indicates that they have a firm mastery of pedagogic practices and certainly know much about teachers' needs.
Table 1: Participants’ Profile in terms of Gender, Age Range and Teaching Experience

<table>
<thead>
<tr>
<th>Participants in Terms of Sex</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>193 (59.9%)</td>
<td>129 (40.1%)</td>
<td>322 (100%)</td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>322 (100%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age Range</th>
<th>25–30 Years</th>
<th>31-35 Years</th>
<th>36 - 40 Years</th>
<th>41+ Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>5 (1.6%)</td>
<td>12 (3.7%)</td>
<td>35 (10.9%)</td>
<td>270 (83.9%)</td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>322 (100%)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age Range</th>
<th>5-10 years</th>
<th>11-15 years</th>
<th>16 - 20 years</th>
<th>21-25 years</th>
<th>26+ Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>28 (8.7%)</td>
<td>42 (13.0%)</td>
<td>96 (29.8%)</td>
<td>88 (27.3%)</td>
<td>68 (21.1%)</td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>322 (100%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2 shows participants’ perceived usefulness of OER in the enhancement of learning outcomes. The various responses indicate that a majority of the participants perceive OER as very useful in various instructional delivery processes. The Standard Deviation (STD) indicates that most of the responses of the participants were clustered around the mean. This indicates that participants in this study perceive OER as very useful in the school curriculum.

Table 2: Perceived Usefulness of OER

<table>
<thead>
<tr>
<th>Test items</th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
<th>N</th>
<th>Mean</th>
<th>STD</th>
</tr>
</thead>
<tbody>
<tr>
<td>OER can accommodate diverse learners’ needs</td>
<td>12 (3.7%)</td>
<td>7 (2.2%)</td>
<td>32 (9.9%)</td>
<td>154 (47.8%)</td>
<td>117 (36.3%)</td>
<td>322</td>
<td>4.14</td>
<td>1.04</td>
</tr>
<tr>
<td>OER can increase learners satisfaction with the learning experience</td>
<td>9 (2.8%)</td>
<td>13 (4.0%)</td>
<td>33 (10.2%)</td>
<td>157 (48.8%)</td>
<td>110 (34.2%)</td>
<td>322</td>
<td>4.22</td>
<td>1.05</td>
</tr>
<tr>
<td>OER can increase learners’ engagement with lesson content</td>
<td>13 (4.1%)</td>
<td>4 (1.2%)</td>
<td>45 (14.0%)</td>
<td>176 (54.7%)</td>
<td>84 (26.1%)</td>
<td>322</td>
<td>4.17</td>
<td>1.08</td>
</tr>
<tr>
<td>OER can increase learners’ participation in class discussions</td>
<td>9 (2.8%)</td>
<td>5 (1.6%)</td>
<td>47 (14.6%)</td>
<td>162 (50.3%)</td>
<td>99 (30.7%)</td>
<td>322</td>
<td>4.17</td>
<td>.99</td>
</tr>
<tr>
<td>OER can lead to improved learners’ grades</td>
<td>11 (3.4%)</td>
<td>8 (2.5%)</td>
<td>46 (14.3%)</td>
<td>134 (41.6%)</td>
<td>122 (37.9%)</td>
<td>322</td>
<td>4.26</td>
<td>1.11</td>
</tr>
<tr>
<td>OER can develop learners’ independence and self-reliance</td>
<td>8 (2.5%)</td>
<td>16 (5.0%)</td>
<td>49 (15.2%)</td>
<td>136 (42.2%)</td>
<td>113 (35.1%)</td>
<td>322</td>
<td>4.14</td>
<td>1.07</td>
</tr>
<tr>
<td>OER can increase collaboration and/or peer-support among learners</td>
<td>8 (2.5%)</td>
<td>11 (3.4%)</td>
<td>62 (19.3%)</td>
<td>160 (49.7%)</td>
<td>81 (25.2%)</td>
<td>322</td>
<td>3.99</td>
<td>.97</td>
</tr>
<tr>
<td>OER can increase learners’ enthusiasm for future study</td>
<td>9 (2.8%)</td>
<td>9 (2.8%)</td>
<td>48 (14.9%)</td>
<td>163 (50.6%)</td>
<td>93 (28.9%)</td>
<td>322</td>
<td>4.07</td>
<td>.97</td>
</tr>
<tr>
<td>OER can build learners’ confidence</td>
<td>12 (3.7%)</td>
<td>14 (4.3%)</td>
<td>40 (12.4%)</td>
<td>176 (54.7%)</td>
<td>80 (24.8%)</td>
<td>322</td>
<td>3.97</td>
<td>.99</td>
</tr>
</tbody>
</table>

Note: Strongly Disagree (SD), Disagree (D), Neutral (N), Agree (A), Strongly Agree (SA)
Table 3 is the summary of participants’ perceived ease of use of OER. This data indicates that a majority of the participant who have a close relationship with their constituent teachers can encourage them to use OER to support instruction in their classrooms. From the different responses in this construct, it is obvious that a majority of participants see many challenges in the effective use of OER. The variation in the mean and standard deviation of each statement indicates that the participants’ responses vary. However, the standard variation is clustered around the mean scores.

Table 3: Perceived Ease of Use of OER

<table>
<thead>
<tr>
<th>Test items</th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
<th>N</th>
<th>Mean</th>
<th>STD</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have requisite ICT Skills to use OER</td>
<td>27</td>
<td>(8.4%)</td>
<td>122 (37.9%)</td>
<td>90 (28.0%)</td>
<td>32 (10.0%)</td>
<td>51</td>
<td>(15.8%)</td>
<td>322</td>
</tr>
<tr>
<td>It is easy for me to search OER online</td>
<td>21</td>
<td>(6.6%)</td>
<td>131 (40.7%)</td>
<td>60 (18.6%)</td>
<td>33 (10.2%)</td>
<td>77</td>
<td>(23.9%)</td>
<td>322</td>
</tr>
<tr>
<td>It is easy to evaluate the usefulness (value and quality) of OER</td>
<td>23</td>
<td>(7.1%)</td>
<td>128 (39.8%)</td>
<td>92 (28.6%)</td>
<td>30 (9.3%)</td>
<td>49</td>
<td>(15.2%)</td>
<td>322</td>
</tr>
<tr>
<td>It is to adapt (remix) different OER</td>
<td>33</td>
<td>(10.2%)</td>
<td>110 (34.2%)</td>
<td>105 (32.6%)</td>
<td>35 (10.9%)</td>
<td>39</td>
<td>(12.1%)</td>
<td>322</td>
</tr>
<tr>
<td>I can interpret the different licenses of OER</td>
<td>69</td>
<td>(21.4%)</td>
<td>57 (17.7%)</td>
<td>138 (42.9%)</td>
<td>29 (9.0%)</td>
<td>29</td>
<td>(9.1%)</td>
<td>322</td>
</tr>
<tr>
<td>It is easy to implement different Copyright licenses</td>
<td>38</td>
<td>(11.8%)</td>
<td>61 (18.9%)</td>
<td>147 (45.7%)</td>
<td>59 (18.3%)</td>
<td>17</td>
<td>(5.3%)</td>
<td>322</td>
</tr>
<tr>
<td>It is easy to encourage teachers to use OER in their lessons</td>
<td>22</td>
<td>(6.8%)</td>
<td>53 (16.5%)</td>
<td>30 (9.3%)</td>
<td>105 (32.6%)</td>
<td>112</td>
<td>(34.8%)</td>
<td>322</td>
</tr>
</tbody>
</table>

Note: Strongly Disagree (SD), Disagree (D), Neutral (N), Agree (A), Strongly Agree (SA).

Table 4 shows participants’ attitudes towards OER. A greater majority of participants agreed with the statements related to their attitude towards OER. This indicates that participants do not have a negative attitude towards OER despite the perceived limitations expressed in the perceived ease of use construct. However, some of them were neutral and a few others disagreed with the statements.

Table 4: Attitudes towards OER

<table>
<thead>
<tr>
<th>Test items</th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
<th>N</th>
<th>Mean</th>
<th>STD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sharing of educational resources improves my professional respect</td>
<td>9</td>
<td>(2.8%)</td>
<td>9 (2.8%)</td>
<td>58 (18.0%)</td>
<td>163 (50.6%)</td>
<td>83</td>
<td>(25.3%)</td>
<td>322</td>
</tr>
<tr>
<td>It gives me pleasure if someone adopts/ adapts my educational resources</td>
<td>6</td>
<td>(1.8%)</td>
<td>13 (4.0%)</td>
<td>70 (21.7%)</td>
<td>159 (49.4%)</td>
<td>74</td>
<td>(23.0%)</td>
<td>322</td>
</tr>
</tbody>
</table>

Table 4: Continued

<table>
<thead>
<tr>
<th>Test items</th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
<th>N</th>
<th>Mean</th>
<th>STD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sharing helps me to get feedback</td>
<td>7</td>
<td>3</td>
<td>84</td>
<td>160</td>
<td>68</td>
<td>322</td>
<td>3.96</td>
<td>.95</td>
</tr>
<tr>
<td>Sharing enhances my personal and organizational reputation</td>
<td>11</td>
<td>7</td>
<td>82</td>
<td>143</td>
<td>79</td>
<td>322</td>
<td>4.00</td>
<td>1.08</td>
</tr>
<tr>
<td>Sharing of educational resources increases my profile amongst peers and others</td>
<td>13</td>
<td>11</td>
<td>69</td>
<td>161</td>
<td>68</td>
<td>322</td>
<td>3.97</td>
<td>1.10</td>
</tr>
<tr>
<td>OER increases my network and sphere of influence</td>
<td>12</td>
<td>11</td>
<td>90</td>
<td>148</td>
<td>61</td>
<td>322</td>
<td>3.85</td>
<td>1.08</td>
</tr>
<tr>
<td>As a pedagogic supervisor, it is my responsibility to share all educational resources created by me</td>
<td>7</td>
<td>8</td>
<td>50</td>
<td>125</td>
<td>132</td>
<td>322</td>
<td>4.18</td>
<td>.96</td>
</tr>
</tbody>
</table>

Note: Strongly Disagree (SD), Disagree (D), Neutral (N), Agree (A), Strongly Agree (SA).

Table 5 shows participants' behavioural intention towards OER. A greater majority of participants agreed to the statements related to their behavioural intention towards OER. These responses indicate that after the participants were sensitised on the importance of OER and how it can be used to enhance learning outcomes, they became interested despite the lack of requisite skills to use the resources.

Table 5: Behavioural Intention

<table>
<thead>
<tr>
<th>Test items</th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SAç</th>
<th>N</th>
<th>Mean</th>
<th>STD</th>
</tr>
</thead>
<tbody>
<tr>
<td>I intend to use OER to enhance my knowledge</td>
<td>7</td>
<td>15</td>
<td>69</td>
<td>157</td>
<td>72</td>
<td>322</td>
<td>3.93</td>
<td>1.03</td>
</tr>
<tr>
<td>I intend to sensitise teachers on the need to explore OER in teaching and learning</td>
<td>7</td>
<td>7</td>
<td>49</td>
<td>162</td>
<td>97</td>
<td>322</td>
<td>4.11</td>
<td>.93</td>
</tr>
<tr>
<td>In intend to use OER to support teacher professional development</td>
<td>9</td>
<td>15</td>
<td>63</td>
<td>163</td>
<td>72</td>
<td>322</td>
<td>3.97</td>
<td>1.05</td>
</tr>
<tr>
<td>I intend to support the Ministry to implement OER policy</td>
<td>10</td>
<td>12</td>
<td>74</td>
<td>147</td>
<td>79</td>
<td>322</td>
<td>4.02</td>
<td>1.12</td>
</tr>
</tbody>
</table>

Note: Strongly Disagree (SD), Disagree (D), Neutral (N), Agree (A), Strongly Agree (SA).
Table 6 indicates participants perceived barriers to the adoption of OER. The findings of this construct indicate that, apart from one of the test items, the participants see the rest as barriers for the effective adoption of OER. The mean and standard deviation varied thus indicating the variability of participants’ responses.

<table>
<thead>
<tr>
<th>Test items</th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
<th>N</th>
<th>Mean</th>
<th>STD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficulties finding relevant OER is barrier</td>
<td>44 (13.7%)</td>
<td>35 (10.9%)</td>
<td>102 (31.7%)</td>
<td>70 (21.7%)</td>
<td>71 (22.0%)</td>
<td>322</td>
<td>3.18</td>
<td>1.54</td>
</tr>
<tr>
<td>No time to search for OER is barrier</td>
<td>57 (17.7%)</td>
<td>83 (25.8%)</td>
<td>104 (32.3%)</td>
<td>62 (19.3%)</td>
<td>16 (5.0%)</td>
<td>322</td>
<td>2.78</td>
<td>1.44</td>
</tr>
<tr>
<td>No internet connection to access OER is a barrier</td>
<td>65 (20.2%)</td>
<td>34 (10.6%)</td>
<td>75 (17.1%)</td>
<td>71 (22.5%)</td>
<td>77 (23.9%)</td>
<td>322</td>
<td>3.08</td>
<td>2.19</td>
</tr>
<tr>
<td>Lack of computer skills to search for OER is a barrier</td>
<td>50 (15.5%)</td>
<td>41 (12.8%)</td>
<td>68 (21.1%)</td>
<td>81 (25.2%)</td>
<td>82 (25.5%)</td>
<td>322</td>
<td>2.73</td>
<td>1.60</td>
</tr>
<tr>
<td>Lack of skills to adapt different OER is a barrier</td>
<td>52 (16.1%)</td>
<td>25 (7.8%)</td>
<td>77 (23.9%)</td>
<td>89 (27.6%)</td>
<td>79 (24.5%)</td>
<td>322</td>
<td>2.96</td>
<td>1.50</td>
</tr>
<tr>
<td>Lack of skills to interpret the different OER licenses is barrier to me</td>
<td>36 (11.2%)</td>
<td>35 (10.9%)</td>
<td>131 (40.7%)</td>
<td>61 (18.9%)</td>
<td>59 (18.3%)</td>
<td>322</td>
<td>3.12</td>
<td>1.49</td>
</tr>
</tbody>
</table>

Note: Strongly Disagree (SD), Disagree (D), Neutral (N), Agree (A), Strongly Agree (SA).

Discussion

Based on Muganda et al. (2016) and Davis et al. (1989) framework, this study measured participants’ acceptance and use of OER in five constructs namely: (a) perceived usefulness of OER; (b) perceived ease of use of OER; (c) barriers to the use of OER; (d) attitudes towards OER; and (e) behavioural intention to use OER.

Perceived Usefulness

The findings revealed that a majority of the participants perceive OER as very strategic in accommodating learners’ diverse needs, engagement, satisfaction, grade scores and self-reliance. Besides perceiving the benefits of OER on the side of the learners, the participants also see it as a pathway for peer collaboration and as a means to improve their productivity. These findings corroborate with other studies which argue that beneficiaries of a new technology must see its usefulness before they can buy-in (Kim et al., 2015; Zhang & Li, 2017; Muganda et al., 2016). Similarly, TAM postulates that the success of an innovation begins with the targeted population perceiving the usefulness of the innovation in their routine practices. Perceiving OER as useful in accomplishing their job-description is a step forward in the acceptance of the resources. The few participants who disagreed or remained neutral could eventually make a move in the right direction if they see their colleagues using the resources.
**Perceived Ease of Use**

The major finding related to perceived ease of use indicated that majority of the participants disagreed as can be seen in the mean score and standard deviation of each test item (Table 4). Ease of use is one of the determinant factors when it comes to motivating a target group to accept innovation. Once they perceive it as complicated to implement, they can easily reject (Kim et al., 2015; Zhang & Li, 2017). Therefore, the findings in this construct are an indication that participants need further training to be able to perform the tasks associated with the use of OER. The skills to be developed here ranges from the ability to use ICT skills to search for relevant resources online; evaluate, adapt, interpret licences; and be able to encourage supervisee teachers to use the resources. Perceiving the use of OER as difficult could adversely affect the use of the resources.

**Barriers**

The barriers included difficulties in finding relevant OER; lack of computer skills to search for OER; lack of skills to adapt different OER; and lack of skills to interpret the different OER licenses. If teachers do not have requisite skills to do all that is required to use OER, they tend to reject it (Pantò & Comas-Quinn, 2013). In order to ensure that they adopt and use the resources; there is a need for a capacity building programme to empower them with requisite skills.

**Attitudes**

Seeing its benefits in instructional process, most agreed that sharing OER improves their professional respect; make them feel proud if someone is using their resources; helps them get feedback; enhance their personal and professional reputation; increase their network; and sphere of influence. Attitude is paramount in the acceptance of any innovation (Rolfe, 2012; Panda & Santosh, 2017). TAM upholds that the attitude of beneficiaries of any innovative technology is influenced by either perceived usefulness and/or perceived ease of use. On the other hand, some researchers postulate that once the target population has a positive attitude towards the innovation the probability of succeeding is high. Based on these assertions the positive attitude of majority of the participants is an indication that they will use OER if they have the requisite skills.

**Behavioural Intention**

A majority of the participants are disposed to using OER. Attitude is the key determinant of behavioural intention, and once the beneficiaries are positive about the new technology, their chances of using it is high. The participants of this study intend to use OER to enhance their knowledge; sensitize supervisee teachers on the need to explore OER in teaching and learning; and use OER to support teacher professional development. These findings are in line with the work of other researchers who also reported that once educators’ attitudes are positive towards an innovation, their behaviour intention is also positive (Kim et al., 2015; Zhang & Li, 2017; Muganda et al., 2016).

**Conclusion**

The use of OER in Cameroon’s educational system is still in an early stage. Other educational systems within Sub Sahara Africa are already exploring the potential of OER to cut down the high cost of textbooks and increase access to quality learning materials. While probing Regional Pedagogic Supervisors for both Basic and Secondary Education in Cameroon, this study explores the perceived
usefulness of OER; perceived ease of use of OER; barriers to the use of OER; attitudes towards OER; and behavioural intention to use OER. Based on the findings, it is recommended that (a) the stakeholders in the respective Ministries of Education take necessary measures to empower the supervisors with requisite skills – build capacity on how to search for OER, identify what is relevant, interpret the different OER licenses, adapt the resources to suit specific needs and use them for instructional purposes. This should be a key focus in future research work; (b) the Ministries should accelerate plans to connect schools to the internet so that teachers can make maximum use of the large volumes of resources available online; Thus far, the best strategy to distribute OER in a cost effective manner is through the internet. Developing the infrastructure will not only serve the purpose of distributing resources but will also assist teachers and learners to enhance learning outcomes; and (c) validation and implementation of the policy documents created during the nationwide advocacy and sensitization campaign conducted in 2016 to accelerate the use of OER in schools under the Ministries of Basic and Secondary Education. The availability of a policy document will foster the quick take-off of OER since it clearly defines the role of stakeholders.

Acknowledgements
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Innovative Arts-Based Learning Approaches adapted for Mobile Learning

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Abstract
Online learning continues to evolve from computer-based learning to more focus on mobile learning. With this evolution comes the need to develop (and evaluate) instructional strategies effective in mobile learning. This work-in-progress features a description of four innovative instructional strategies adapted from approaches we developed, used, and evaluated successfully in computer-based online learning. These newly adapted strategies—poetweet, photo pairing, reflective mosaic, and the six-word story—all use arts-based approaches. In our past research we found similar strategies developed for online teaching encouraged interaction, enhanced social presence, and facilitated community. This paper features a description of these modified learning activities recreated for the mobile learning environment. We have completed preliminary testing of these newly revised learning activities in m-learning, and in the future we will formally study these to determine if arts-based strategies revised to suit m-learning create the same positive outcomes as were found when we used arts-based approaches in e-learning.

Keywords: mobile learning, e-learning, arts-based instructional strategies, interaction, social presence, community of inquiry

Introduction
With mobile learning there is the potential for learners to feel isolated detracting from their educational experience and ultimately from their learning. This sense of isolation may be due in part to lack of social presence, limited interaction with peers and teachers, and a lack of a sense of a learning community. In previous research we explored the influence of arts-based instructional strategies on these factors in online post-secondary classrooms (Perry & Edwards, 2016). Social presence was defined as “the ability of students and teachers to project their personal characteristics into the community of inquiry, thereby presenting themselves as ‘real people’” (Garrison, Anderson & Archer, 1999, p. 87). Interaction focused on meaningful dialogue and collaboration between learners, and between learners and instructors. According to Thormann and Fidalgo (2014) when students experience a sense of community they feel safe and respected and this aids in learning.

Arts-based strategies as those founded in the arts, specifically literary, visual, musical, or drama mediums. Our earlier research found that interaction, social presence, and the sense of community were enhanced when arts-based approaches were used, in part because they encouraged creativity, helped to build rapport among participants, personalized interactions, cultivated trust, and promoted learner control (Janzen, Perry & Edwards, 2012a). We concluded that arts-based instructional strategies contributed to positive student outcomes.

As we are increasingly moving from a computer-based online learning milieu to mobile learning we are in the process of re-inventing and re-creating some of these successful arts-based instructional strategies. The biggest challenge of adapting these strategies for mobile learning is ensuring effective instructional design principles are used in the adaptation (Irby & Strong, 2015) and that the principles
used are applicable to design of m-learning (Tseng, Tang & Morris, 2016). This paper demonstrates four of these innovative strategies.

All activities were offered in master's level online courses that were part of the curriculum for a degree in health disciplines at Athabasca University in Canada. Learners engaged in the activities during asynchronous courses in topics such as health education, organizational change, and organization theory.

Conceptual Framework

The conceptual framework for this approach comes from Vygotsky's (1978) Social Development Theory (SDT) and Janzen, Perry and Edward's Student-Instructor-Technology-Environment (SITE) model (2012b). According to SDT, social interaction is essential for cognitive development (Vygotsky, 1978). Applying SDT to mobile learning, if learners are provided learning opportunities that facilitate social connections with others (fellow learners and instructors) then learning should be enhanced. According to the SITE model, effective e-learning requires interaction among the student, instructor, and technology elements of the online learning environment (Janzen et al. 2012b). Further, as students interact with others, they become more engaged with learning and begin to have a positive and enjoyable experience which often leads to feelings of belongingness, safety, and comfort in the learning environment. When learners are in such a state there is potential for risk-taking and creative learning outputs (Janzen, Perry & Edwards, 2019). We are extrapolating this to mobile learning as well as it is a subset of online learning. The Community of Inquiry (CoI) theoretical framework holds that online learning is maximized when a group of learners form a community, engage in critical discourse and reflection, and experience social presence, teaching presence, and cognitive presence (Garrison et al., 1999). Together, SDT, the SITE model, and the CoI form the foundation for this ongoing research into the use of arts-based instructional strategies in mobile learning (see Figure 1).

![Conceptual Framework](image-url)
Arts-Based Instructional Strategies

The worth of the arts as teaching tools has long been recognized in face-to-face education (Clover & Sanford, 2016). Specifically, art, photography, literature, poetry, music, and drama have been reported as contributing positively to the in-person classroom educational experience. Stated outcomes of arts-based teaching strategies include reflection (McKay & Barton, 2018), creation of a safe learning environment, stimulation of dialogue, and student engagement in the affective domain (van der Hoeven, Srogi, Husman, Semken & Fuhrman, 2011). We found arts-based instructional strategies used in online graduate courses increased quality of interactions, enhanced sense of community, furthered application of course content, and helped learners establish group identity where ideas were respectfully shared and divergent perspectives admired (Perry, Edwards, Menzies & Janzen, 2011). These inexpensive, adaptable teaching interventions enhanced learning environments by encouraging creativity and risk-taking.

In sum, it seems that arts-based approaches humanize the online learning environment that some students find socially isolating (Melrose, Park & Perry, 2019). Fox (2017) agrees that online learners sometimes feel disconnected from peers because of the separation of distance and time. To overcome this sense of separation, Fox recommends learning activities that promote learner collaboration and focus on cognitive and social-emotional learning outcomes. Such outcomes are achieved in part through incorporation of arts-based activities (Fox, 2017). Astleitner (2018) focuses on the motivation that distance learners experience when they sense human presence of their teacher and classmates that results in a sense of community in an online classroom. Astleitner attributes student motivation and commitment to learning in part to “feelings of closeness and community” (2018, p. 14) among student learning online. Davis, Chen, Hauff and Houben (2018) agree that learning strategies that involve a sense of group and togetherness are essential as education moves from the traditional classroom to the web. Arts-based approaches are one way that this sense of humanness can be maintained as this transition occurs.

To be valuable in mobile learning, arts-based strategies need to be effective on small screen devices such as smart phones and tablets. Mobile learning requires teaching strategies appropriate to the limitations and strengths of mobile devices. Like computer-based learning, successful mobile learning requires strategies that forge alliances among instructors and students, between learners and the learning environment, and between learners and technology. This needs to be achieved by a melding of interactivity, creativity and technology. There is limited research related to development and testing of teaching strategies to achieve these outcomes in mobile learning.

To address this gap, we are revising some of our successful arts-based instructional strategies that have worked well in the computer-based learning milieu to be appropriate for mobile learning. Specifically, we have revised our poetry-based strategy called “Haiku it!” to mobile friendly “Poetweet”, changed a photography inspired strategy called “Photovoice” to mobile appropriate “Photo Paring”, and changed our quilting activity called “Conceptual Quilting” to an activity that can be completed using social media we call “Reflective Mosaic.” Finally, we describe the six-word story activity that could work well in both types of learning environments. Each revised activity is described below.

Poetweet

Poetweet is a form of short poetry. Poetry potentially conveys human emotion, vague ideas, and complex feelings within the limitation of a few words. As is said of poems, they do not require a summary because “the poem is the thing” (van Manen, 2007). When student reflections are related
to human interaction, poetry provides an avenue to capture and share these experiences and recollections using a specific form.

To challenge students to drill down to the essence of course concepts and their experiences, we developed a teaching strategy called Haiku It! The activity proceeds in this way. Students are invited to reflect on a specific clinical experience or course concept and record their thoughts in a Haiku. The form and framework of the Haiku encourages students to be concise as they create their poems. In order to be concise students need to find a very clear understanding of the key elements related to a given concept or to distill the essence of their experiences. Further, writing and sharing reflective Haikus often provides an avenue for fulfilling affective domain learning outcomes as personal attitudes and feelings are self-assessed and then displayed through these poems.

Poetweet is a mobile friendly way for learners to create and share Haikus or other short poems that convey the essence of course concepts. Sharing these poems with the class through a tweet ensures a world limit is abided by. Students follow the same procedure as they would in Haiku it! with the difference being the venue for sharing their creations.

Others have written about poetry shared through twitter (although in these writings the poetry was not an element of online learning but a venture for poets to share their world widely). Specifically, these twitter poems have been referred to as micropoetry and twihaiku (Cripps, 2013). Those who have experience writing twitter poems comment that being forced to stay within the minimalist word count of Twitter compels them to get to the point and be precise with words. Such brief poems can create powerful learning.

An example of a poetweet in the form of a Haiku appears in Figure 2. This Haiku was written by a Master of nursing student who was taking a course on how to be a clinical nurse educator. The poetweet demonstrates the depth of understanding she has regarding the role of an educator.

Daily, teachers are learners,
Journey together.
Not long ago, you were me.

Figure 2: Example of a Poetweet

**Photo Pairing**

The second strategy is called photo pairing. In online computer-based courses we use an arts strategy called photovoice. Photovoice as an instructional activity involves an instructor posting a digital photographic image for the class at the onset of each unit of the course. The instructor generates a reflective question that accompanies the purposely selected image, inviting students to react, or give voice, to the photograph through a written conference posting (Perry, Dalton & Edwards, 2009).

To adapt this strategy to mobile learning we propose continuing to use images which are easily shared on mobile devices, but to reduce the text element of the activity. Specifically, the mobile adapted strategy is called photo pairing. Students are asked to locate and share two images that, when juxtaposed, present alterative views on a course theme or topic.

For example, in one instance students were asked to select an image that spoke to them about feelings of shame and blame in a work setting and then to juxtapose this image with another that provides a visual representation of an organizational culture of support. Next, students shared their selected images with the class. For students to successfully select these images that portray different perspectives on a topic, they need to comprehend the conflicting views. Figure 3 demonstrates the juxtaposition of these two images –one of a shame and blame workplace (3a) and the second image of a supportive workplace (3b).
Reflective Mosaic

The third adapted strategy we named reflective mosaic. It evolved from a teaching strategy we called conceptual quilting has been used in online graduate courses as a summary reflection activity. Students are asked to construct a virtual quilt that is comprised of ideas, metaphors, theories, and other details from the course that they found most meaningful. The “quilt” needs to be in a medium that can be shared electronically with the class. The construction of the conceptual quilt encourages learners to reflect as they interact a second time with course materials. Students comment that conceptual quilting helps them consolidate their learning and bring closure to the course. From a social interactive perspective, the sharing of the completed quilts is a way for students to acknowledge the impact that others (teachers and peers) have had on their learning.

Conceptual quilting can be adapted to mobile learning while still maintaining the arts influence and the opportunity for students to reflect on their learnings from a course. A new activity called reflective mosaic takes the essentials of conceptual quilting and creates a new activity that can be created and shared on mobile devices. Students are invited to comb through their course materials and learnings and put together a mosaic of ideas, themes, concepts, and notions from a course that they
want to remember and use in the future. This mosaic creation can take any form and use any social media platform they prefer. The finished mosaic can be shared with the class and instructor which could stimulate reflection and consolidation of learning in others. Figure 4 provides an example of a reflective mosaic creative for a graduate level course on education of health professionals.

**The Six Word Story**

Finally, the fourth strategy for m-learning is the six word story. Story-telling has long been a way of oral teaching in many cultures. A teaching approach called the six word story asks learners to convey any course related concept in a six word sentence. For example, if the course topic is grief one profound message is told by the story, “The heaviest coffins are the smallest.” For a course topic resistance to organizational change a sentence story could be, “Reluctantly he changed is to was.”

This strategy has been used successfully in online courses as a summary activity or as an activity to open discussion of a challenging topic. It seems this strategy could be equally successful in mobile learning, in part because of the brevity of the text used to convey depth of insight. Twitter would be a natural fit for such a learning strategy. The following is an example of a six word story written by a nurse to demonstrate the grief faced by a teenager dancer who lost a leg to an osteosarcoma - “Broken-hearted, ballet shoes come in pairs.”

**Conclusion**

This project is in progress, so formal evaluation of success is not yet known. Although the adapted learning activities has been conceptualized, they have yet to be formally studied with mobile learners.
This will be the next stage of this project. There are many possible applications of these, and other, arts-based instructional strategies in mobile learning. Most of these activities use minimal text and are created to encourage sharing with class members and collaborative learning which is facilitated by mobile milieu. The potential for arts-based instructional strategies to be powerful teaching tools in mobile courses is encouraging.

Online learners, including those who use mobile devices as their “classrooms”, are potentially experiencing the same feelings of social isolation as experienced by all students who study at a distance. The CoI model (Garrison et al., 1999), SITE model (Janzen et al., 2012b), and SDT (Vygotsky, 1978) all lead educators to the conclusion that social interaction is an integral element in successful learning. Instructional strategies that aim to help learners feel that sense that they are part of a community of learners, and that focus on social—emotional as well as cognitive learning outcomes, are essential to success with distance learning. Arts-based teaching approaches introduce the human element to the learning milieu even if the learning takes place at a distance. The small screen of the mobile device requires that all instructional approaches be adapted to work well on the limited viewing space of these devices. The four strategies proposal and demonstrated in this paper may be excellent approaches that educators can use to help create learner success in this increasing common teaching space of m-learning.

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Developing Open Practices in Teacher Education: An Example of Integrating OER and Developing Renewable Assignments

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Abstract
This manuscript offers a reasoning for and example of integrating Open Educational Resources (OER) and open pedagogy within a teacher education course. We highlight a collaborative partnership between library faculty and education faculty and the decision points and processes we used when redesigning this course to provide an example of adopting OER and our considerations for developing a renewable assignment. The benefits of using OER for K-12 teachers include increasing awareness of and providing opportunities to develop open practices. The transition to a renewable assignment creates a space for teaching candidates to meaningfully contribute to the profession and engage in collaboration across time and space. Teacher education programs provide an ideal space to develop digital literacies and open practices.

Keywords: OER, open education, OER-enabled pedagogy, open pedagogy, teacher education, renewable assignments

Introduction
Adoption of Open Educational Resources (OER) in the United States is often discussed in relation to institutions of higher learning, neglecting the potentially critical role of these materials in Kindergarten through 12th grade (K-12) education. OER refer to materials assigned Creative Commons licenses, which allow for the materials to be retained, reused, revised, remixed, and redistributed (the 5R permissions; Wiley, n.d.). Within the K-12 landscape, reports of OER use by teachers is limited because change occurs at the “highly bureaucratic state level or at the hidden local level” (Kimmons, 2014, p. 72). School districts across the nation routinely make local decisions regarding curricular materials, with OER just beginning to gain recognition as a valuable classroom resource. The State Educational Technology Directors Association (SETDA), an organization of state education agency leaders, maintains a website with resources for integrating OER in K-12 education (SETDA, n.d.). Yet, more than a website is needed for K-12 teachers to develop the skills required to adopt, adapt, and create OER. Kimmons (2014) has asserted that we have yet to explore the best ways to support teachers in adopting open practices for teaching and learning. Teacher education programs provide an opportunity to raise awareness of OER, as well as create space for teachers to explore open practices that may be incorporated into their developing pedagogy.

In New York, the public university systems (CUNY and SUNY) received funding for the adoption and creation of OER (New York State, Office of the Governor, 2018). With this support, New York teacher education programs can simultaneously eliminate textbook costs by assigning OER and utilizing open pedagogy practices to encourage K-12 teachers to create and adapt OER in their classrooms. Teacher educators have a unique opportunity to introduce teacher candidates to the concepts of open education. In this manuscript, we discuss why and how a teacher education course was transformed to include OER and open pedagogy. Open pedagogy, also commonly referred to
as OER-enabled pedagogy, incorporates a student-centered approach to teaching and authentic learning experiences in which students participate as creators in the design of open content using the 5R permissions (Wiley & Hilton, 2018). Renewable assignments, those that add value to the world because students share their work openly using 5R permissions, are one such approach to open pedagogy (Wiley & Hilton, 2018). In this paper, we highlight a collaborative partnership between education faculty, Van Allen, and library faculty, Katz, and our decision points and processes of redesigning a teacher education course that may be used as an example for others engaging in this work. The course redesign included three stages of reconsidering the course: OER integration, preparing for OER-enabled pedagogy with the development of a renewable assignment, and our considerations for scaffolding student learning about OER and negotiating choices about sharing their work. The scope of this paper is limited to the design decisions we made, not the implementation of and student reactions to the course.

**OER and Open Pedagogy**

Open pedagogy reconceives the notion of who creates knowledge and provides a pathway to empower students as creators. DeRosa and Jhangiani (2017) framed this concept as “a site of praxis, a place where theories about learning, teaching, technology, and social justice enter into a conversation with each other and inform the development of educational practices and structures” (para. 2). Within the past ten years, the term “open pedagogy” has been linked to open practices that are enabled by teaching with OER, or “high-quality teaching, learning, and research materials that are free for people everywhere to use and repurpose.” (Hewlett Foundation, n.d., para. 7). This discourse around the terminology has led to the concept of OER-enabled pedagogy, a “set of teaching and learning practices that are only possible or practical in the context of the 5R permissions which are characteristic of OER” (Wiley & Hilton, 2018, p. 135). In this teaching approach, the permissions afforded by OER present new pedagogical opportunities and invite authentic learning as students create, remix, and share their ideas to further knowledge in their discipline (Wiley & Hilton, 2018). Students learn more from activities that require them to apply learning rather than merely complete an activity for practice (Lombardi, 2007). Thus, teaching with OER has resulted in numerous benefits for students, including free access to knowledge, a culture of participation, and opportunities for innovation and creativity (Hegarty, 2015).

Leveraging the possibilities afforded by these permissions creates a space for students to complete assignments that extend beyond a grade. This shift from a “disposable assignment” to a “renewable assignment” empowers students to generate OER materials (Jhangiani, 2017; Wiley, 2013). Stommel (2015) discusses how “we [teachers] can open our classroom by creating assignments that have more reason than just a single teacher as an audience. By doing this, we give students reasons less banal than points to do the work of learning” (p. 23). Renewable assignments can be positioned to have greater impact through time, space, and gravity, particularly as they have longevity, reach, and value (Seraphin et al., 2018).

Wiley and Hilton (2018) developed criteria to distinguish assignments into four categories - disposable, authentic, constructionist, and renewable. The disposable assignment is one in which a student simply creates an artifact. In an authentic assignment, the artifact developed has value beyond the student’s own learning. Students make their authentic assignment public and beyond the bounds of the teacher-student relationship in a constructionist assignment. To make an assignment renewable, students openly license an artifact that has value beyond the student’s own learning and that has been made public. Wiley and Hilton (2018) have posed the following four questions to determine if an assignment is renewable:

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*Open Praxis*, vol. 11 issue 3, July–September 2019, pp. 311–319
1. Are students asked to create new artifacts (essays, poems, videos, songs, etc.) or revise/remix existing OER?
2. Does the new artifact have value beyond supporting the learning of its author?
3. Are students invited to publicly share their new artifacts or revised/remixed OER?
4. Are students invited to openly license their new artifacts or revised/remixed OER?

In answering yes to all of the questions, an assignment can be considered renewable and a product of OER-enabled pedagogy.

**OER and Open Pedagogy in Teacher Education**

Given that the current incarnation of open pedagogy is a relatively new concept, little research has been conducted on the use of OER and open pedagogy in teacher education. The scant existing research comes from outside the United States. These initiatives have included the Teacher Education in Sub-Saharan Africa (TESSA) program, created as a long term sustainable program for providing quality, freely available, easily adapted, digital materials for teachers and teacher education programs in an effort to improve teaching and learning in Africa (Murphy & Wolfenden, 2013). Another initiative in Southern Africa documented the process nine mathematics teacher educators employed when creating and implementing OER across multiple universities as they strove to improve access to quality teacher education resources in mathematics (Sapiere & Reed, 2018). Each of these projects and programs pointed to key benefits for all involved, particularly related to collaboration, increased teacher awareness of OER, improved access to knowledge (particularly in developing countries), and better adaptation of curriculum.

While some teacher educators simply assign OER, others are engaging teacher candidates in opportunities to create and share knowledge. For example, the Digital Futures in Teacher Education (DeFT) project involved teachers, student teachers, and teacher educators as equal partners in exploring digital literacy as they collaboratively designed OER focused on digital literacy practices in schools (Gruszczynska, Merchant, & Pountney, 2013). Tur, Urbina and Moreno (2016) engaged student teachers in creating digital stories utilizing Creative Commons resources that were then shared under a Creative Commons license. Additionally, Kim (2018) published a framework for implementing OER-based lesson design activities with preservice teachers. Findings have demonstrated that open pedagogy develops teacher identities, improves professionalism, empowers teachers, and provides connection to a global community through the creation of shared content (Kimmons, 2014).

In teacher education, open pedagogy is particularly valuable as it provides teacher candidates with opportunities to develop a professional practice that privileges collaboration and innovation within the teaching community. This is especially important because beginning teachers often feel isolated and alone as they navigate the complexities of teaching, while forming teacher identities (Clandinin et al., 2015). Developing open practices in teacher education programs creates community and connections within the profession across time and space.

**Our Methodology for Redesigning the Course**

In this project, we redesigned a teacher education course in literacy and technology to adopt OER in lieu of a course textbook and adapt the final course assignment utilizing an open pedagogy approach. The intent of the course redesign was to introduce the teacher candidates to OER, help teacher candidates understand aspects of Creative Commons licensing, and experience finding, adapting, reusing, remixing, and creating OER. Given the success of previous research findings in supporting student teachers’ use of OER through experiences in teacher education course work...
(Tur et al., 2016), the emphasis was on developing the teacher candidates’ identities as creators of knowledge and empowering them as innovators and global collaborators in meaningful use of technology in literacy classrooms. Additionally, Kimmons (2014) found that the most important factors in creating a positive open education experience are learning activities involving collaborative group work with other professional educators and an instructor modeling open educational practices and facilitating collaborative learning. Reflection on our decision-making points and processes revealed three stages of the course redesign displayed in Figure 1. In stage 1, we strategically selected the course and identified appropriate OER. During stage 2, we took steps to prepare for OER-enabled pedagogy, including the development of a renewable assignment. Finally, stage 3 consisted of our specific considerations for teaching students about OER and assigning Creative Commons licenses to their work. These stages are described in more depth below.

**Figure 1: Stages of Decision-Making for the Course Redesign.**

**Stage One - Course Selection and OER Integration**

As a professor of Literacy Studies, Van Allen developed interest in OER after attending a training regarding Creative Commons licensing and reviewing OER materials. In consultation with Katz, the Open Resources Librarian, Van Allen carefully considered which course would have the most impact within the program. Van Allen selected her course for literacy teachers titled *Language, Literacy, and Education Technology*. The course focuses on a comprehensive analysis of major topics and concepts related to language and literacy instruction in the 21st century, including digital literacies, critical media literacy, online research and comprehension skills, multimodality, gamification, and the ethos of participation in a global community. Additionally, the nature of OER and openly licensed materials lends itself well to a course focused on technology, given its evolving nature. Therefore, in addition to easing the financial burden on her students in the absence of a textbook, Van Allen is also able to model open educational practices and advocate for the teacher candidates’ use of OER in K-12 education.

Thus, our collaborative work began. Katz helped locate OER related to the course and explained the meaning behind Creative Commons licenses. As Van Allen reviewed and explored these OER, she discovered other openly licensed journals and teacher resources to incorporate into not only the redesigned course, but other courses as well. Moving to a Zero Textbook Cost course often entails...
replacing one commercial textbook with multiple Creative Commons-licensed, library-licensed, and free online resources, including book chapters, journal articles, videos, and websites, as was our experience.

When choosing OER to use in the course, Van Allen carefully curated resources that not only fostered an understanding of the key concepts, but also envisioned the concepts in classroom practice to support application in teacher candidates’ lesson design. Furthermore, Van Allen selected resources that provided lesson plans and materials that may be utilized in the classroom. For example, in addressing content on critical literacy skills, teacher candidates are directed to view a blog post by a researcher in the field of literacy education, which incorporates historical background of the topic and clearly defines critical literacy using embedded videos, as well as text to exemplify points. In addition, teacher candidates read an open access journal article clarifying myths about critical literacy education. During the class session, candidates will engage in a critical literacy model lesson utilizing a freely available video advertisement and explore free critical literacy lessons posted on the popular website Read, Write, Think to evaluate the extent to which critical literacy skills are developed.

**Stage Two - Preparing for OER-Enabled Pedagogy**

During another workshop on OER and open pedagogy, Van Allen pondered her disposable course assignments, where student work basically dies in the learning management system. Given the course emphasis on teaching literacies of global collaboration, it felt natural to shift the final course assignment, a technology integration project, to a renewable assignment that could be adapted and remixed by future classes while participating in the global teaching community.

Table 1 provides the assignment description for the original assignment and the redesigned renewable assignment.

The original assignment was designed to provide the teacher candidates choice in how they demonstrated knowledge of ways they may support students’ 21st century literacy skills in their own classrooms. Utilizing best practices of technology integration in education, the assignment design modeled a student-centered approach, involving choice, creativity, and flexibility in the final design of a meaningful classroom resource, taking the form of a unit or lesson plan, yearlong implementation plan, class project, etc. While the original assignment involved creating an authentic artifact, it did not provide an opportunity to collaborate on an existing resource or share their work with others using Creative Commons licensing.

As Van Allen explored OER and made connections to K-12 education, she considered ways to empower the teacher candidates to engage in global teaching communities. Why not provide teacher candidates with the opportunity to share their projects and influence curriculum more widely? Therefore, Van Allen consulted with Katz regarding tools for sharing teaching resources. Katz, serving as the knowledgeable OER specialist, suggested the use of OER Commons, “a public digital library of open educational resources” that encourages users to “explore, create, and collaborate with educators around the world to improve curriculum” (OER Commons, 2019, para. 1, https://www.oercommons.org/).

Van Allen then reworked the assignment description to provide teacher candidates with options regarding their project utilizing open resources. Rather than requiring the teacher candidates to create something new, she invites them to explore the resources on OER Commons or in the shared class resources collection, which is stored on Google Drive and serves as a space for projects from previous classes. If they find something useful for their classroom, they may adapt,
remake, and/or remix the resource (as allowed by the licensing on the source) to better fit the needs of their local school, student population, grade level, state standards, etc. Alternatively, they may choose to design a new resource.

Table 1: Technology Integration Project Assignment Descriptions

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<th>Original Assignment</th>
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<td>For the culminating assignment in this course, you will design your own project that creatively demonstrates how you will integrate technology/new literacies into your classroom in meaningful ways as a result of what you learned during this course. Your project should exhibit your understanding of the skills students need to be successful in the 21st century and create experiences for students that utilize best instructional practices for integrating these skills into literacy instruction. For example, your project may demonstrate how you empower learners to actively create, collaborate, and/or design. Be sure to include the grade level and specific standards that may be addressed in your project. Ultimately, this project could take many varied forms, so be creative! You may use the ideas we have discussed in class, instructional strategies from your self-selected book, etc. to guide your project. Some ideas are:</td>
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<td>For the culminating assignment in this course, you will design, adapt, or remix an OER resource to share on OER Commons (<a href="https://www.oercommons.org/">https://www.oercommons.org/</a>), then implement it in your classroom. You can design your project from scratch, adapt your project from existing work in your classroom, or adapt, remake, or remix an OER that already exists on OER Commons or in the class shared resource collection on Google Docs. After designing, adapting, remaking, or remixing your OER resource, you are required to upload it in EDR 529’s shared resource collection and on OER Commons using the resource or lesson builder. When you submit your work to Blackboard, you should include a link to the resource on OER Commons. Your project should creatively demonstrate how to integrate technology/new literacies into your classroom to support literacy learning in meaningful ways as a result of what you learned during this course. In addition, your project should exhibit your understanding of the skills students need to be successful in the 21st century and create experiences for students that utilize best instructional practices for integrating these skills into instruction. For example, your project may demonstrate how you empower learners to actively create, collaborate, and/or design. Be sure to include the grade level and specific standards that were addressed in your project. Ultimately, this project could take many varied forms, so be creative! In designing your project, you should use ideas we have discussed in class, instructional strategies from your self-selected book, technology integration ideas from our texts, etc. to guide your project. Some ideas are:</td>
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<td>• A series of lesson plans (or a unit plan)</td>
<td>• A module that includes multimodal resources for a unit of instruction with plans to support their use in the unit and resulting evidence of student use</td>
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<tr>
<td>• An inquiry unit with a digital performance task embedded and different modes of text used within the unit</td>
<td>• A series of lesson plans (or a unit plan) with examples of student work</td>
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<tr>
<td>• A collection of technological resources with minilessons on how/when to use them</td>
<td>• An inquiry unit with a digital performance task embedded and different modes of text used within the unit with examples of student work</td>
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<tr>
<td>• Exemplar models of projects you intend to complete with students</td>
<td>• A collection of technological resources with mini lessons on how/when to use them after implementation of the resources</td>
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<tr>
<td>• Yearlong plan of how you will integrate a specific technological resource into your classroom</td>
<td>• Exemplar models of projects you completed with students along with student attempts</td>
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After designing the renewable assignment, Van Allen consulted with Katz to determine if it met the criteria for open pedagogy, or OER-enabled pedagogy. Viewing the assignment through the questions posed by Wiley and Hilton (2018), it indeed met the criteria of OER-enabled pedagogy:

1. Are students asked to create new artifacts (essays, poems, videos, songs, etc.) or revise/remix existing OER? Yes, students are creating modules and lessons for their classroom.
2. Does the new artifact have value beyond supporting the learning of its author? Yes, value is extended to other teachers and their students.
3. Are students invited to publicly share their new artifacts or revised/remixed OER? Yes, students are invited to share their lessons publicly on OER Commons.
4. Are students invited to openly license their new artifacts or revised/remixed OER? Yes, students are invited to provide an open license in their submission to OER Commons.

**Stage Three - Considerations for Student Learning**

In redesigning the course, Van Allen made decisions during course planning on how to introduce teacher candidates to the concept of OER to support their understanding of these resources and licensing, explore the variety of OER available, evaluate the resources for quality, and model use of OER in lesson planning and classroom learning. Initially, teacher candidates are engaged in using OER to understand the content by accessing resources and noticing the licensing symbols, including copyrighted material and the Creative Commons licensing symbols. As candidates examine and develop an initial understanding of Creative Commons licensing and open access resources, they begin selecting and evaluating OER. In particular, teacher candidates search open education repositories, search engines, and content creation tools widely used in K-12 education, such as OER Commons (www.oercommons.org), MERLOT (www.merlot.org), Project Gutenberg (http://www.gutenberg.org), CK-12 (www.ck12.org) and Curriki (https://www.curriki.org/). As a course requirement, teacher candidates create an account on OER Commons and use the rubrics incorporated within the tool to evaluate a self-selected OER, resulting in a contribution to the community. Once they become more proficient in selecting and evaluating resources, they consider ways to adapt and remix these resources to support student learning of content and develop students’ digital literacy skills. Finally, teacher candidates then engage in adapting, remixing, or creating, and sharing/resharing OER in the final course assignment, the Technology Integration Project. As their work with the OER evolves, the intention is for teacher candidates to develop their own digital literacy skills as they engage with a variety of tools and platforms. The scaffolding of the course redesign is meant to provide an encouraging low stakes entry into the world of OER, moving from simply accessing OER content to contributing OER content.

**Negotiating openness.** Although all teacher candidates are required to submit their final project to the shared class resources collection on Google Docs, they have a choice regarding whether or not they want to submit their resource on OER Commons. Cronin (2017) has identified four levels at which individuals must make decisions when engaging in open networks and sharing as they balance privacy and openness within participatory technologies. At the macro level, individuals must determine whether or not they want to share their work and ideas openly. If they choose to share, they must then negotiate whom they would like to share with (meso level), which digital identity they will share as (micro level), and the types of individual transactions they would like to engage in after sharing (nano level; Cronin, 2017). This is a point of discussion and reflection within the class as teacher candidates make decisions regarding their work.
In addition to negotiating decisions regarding sharing, the teacher candidates also must decide the type of Creative Commons license to use in sharing their work. For example, resources adapted or remixed from a share alike license must be shared with the same license. Therefore, they must fully understand the implications of the license permissions on the resource they chose to adapt, revise, or remix. When creating a new OER, teaching candidates must consider the implications of licensing decisions on how others may use their work. As Cronin (2017) notes, openness “is always complex, personal, contextual, and continually negotiated” (p. 18). Therefore, Van Allen supports students in making thoughtful, informed choices about sharing their work through classroom discussion.

Future Research and Conclusion

Teacher educators are well-positioned to evolve future use of open practices within the K-12 curriculum. As they model the adoption of OER and open practices, teacher educators encourage candidates to reimagine their agency, as they grow professionally and contribute meaningfully to the global teaching community. The focus of this manuscript is on the process we employed when redesigning a teacher education course to include OER and a renewable assignment. Our perspective is limited as we have not yet examined the impact of the course changes. Therefore, further research is needed to explore how developing open practices in teacher education programs may add value to these learning experience and ultimately impact K-12 teaching practices. We plan to assess the impact of these changes on learning outcomes by comparing the choices for OER use and quality of candidates’ work on the original assignment to the renewable assignment. For example, exploring whether students chose to remix or revise an OER or create a new OER and their rationales for doing so could provide valuable data in evaluating how and why teachers candidates may choose to use OER in the future student learning. Additionally, to assess the impact of these course changes on student perceptions, we will examine their reflections through artifacts, surveys, and interviews. Another limitation of our work is that we have not yet examined how our process may be extended for use in teacher education courses that do not emphasize digital literacies. However, we believe that this example is adaptable by others to support future development and use of OER in K-12 classrooms. Although this is challenging work, our greatest hope is to influence teacher candidates to develop open practices and become empowered to engage in the global teaching community.

References


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Book Review of *Responsive Open Learning Environments: Outcomes of Research from the ROLE Project*


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**Introduction**

*Responsive Open Learning Environments: Outcomes of Research from the ROLE Project* (2015) was edited by Sylvana Kroop, Alexander Mikroyannidis, and Martin Wolpers. The project enabled learners to personalize the learning environment and provided a unique tailored learning experience. The ebook consists of 3 initial chapters, 4 case studies chapters, lessons learned, a commentary, a consortium of universities, supplemental materials, and an index which focused on Responsive Learning Environments (ROLE) as a project in Europe. There are 31 authors, 8 external experts and commentators, and 3 editors in the book increasing the credibility of the content. The project used Self-Regulated Learning (SRL) competences and the SRL framework, specifically through widgets that were created and could be utilized by the learners. Widgets are “micro-applications performing a dedicated task (Kroop, Mikroyannidis, & Wolpers, 2015, p. 3).” An interactive eBook that utilizes widgets with learning activities was included as part of the course for learners.

In the initial chapter, the authors credited Personal Learning Environments (PLE) for the emergence of Open Educational Resources (OER), enabling students flexibility with content such as remixing materials. Chapter two contains the framework for the project, shows several models of learning through SRL and further explains that collaboration plays an integral part of SRL learning. Collaboration though doesn’t appear in two of the framework models, although it could be implied in the models. Widgets need to be able to interact and recognize users (Sheila MacNeill, 2015). “Furthermore, the importance of adaption to individual learning preferences of a learner regarding visualisation and verbalisation has been proven” (Plass, Chun, Mayer & Leutner, 1998). One criticism of the project was that students need guidance on how to use technology, including the Learning Activity Recommender (AR) (Kroop et al., 2015, p. 39).
Chapter three focuses on evaluating the framework provided in the previous chapter. Contextualized attention metadata (CAM) can be used to “observe the user at the application level, enabling association of tool usage with content-specific behavior in context.” To evaluate self-directed learning, questionnaires were deployed and analyzed. Interviews and reflections were also used to analyze the data. The community building and motivation approach in Figure 1 provides a realistic base to community-based learning in an online setting. The level playing field was essential for the success of the students, particularly if peers are international, in a recent Massive Open Online Courses (MOOC) study by René F. Kizilcec, Andrew J. Saltarelli, Justin Reich, and Geoffrey L. Cohen (2017).

The ROLE project used a framework (figure 2) based on the technological, organizational, psycho-pedagogical, and social (TOPS) model which “incorporates major dimensions with a gradual progression from the individual to community focus” (Kroop et al., 2015, p. 68). They concluded that the framework covers technological, organizational, psycho-pedagogical and social aspects to analyze the case studies in a multi-method approach (Kroop et al., 2015, p. 73). The analysis focus was on the technology rather than content. The ROLE project started with a self created Learning Management System (LMS) and moved to Moodle with extensions.
Case study 2 talks about Graasp (grasping resources, apps, activity spaces, and people), the social media tool used for collaborative learning. Graasp seems to be space focused, a main portion of multisensory learning. Graasp can be embedded into subspaces and allows subactivities, creating more freedom. It was helpful that the authors included images of Moodle and Graasp, however, it would be useful to include students' reactions to Graasp.

Case study 3 involves the OpenLearn Project from the Open University (OU). OpenLearn contains more than 12,000 hours of self-study materials as Open Educational Resources (OER). Part of the conclusions of this case study were that there was a need for culture with a willingness to use technology. “In order to maximise the adoption of PLEs, a suitable culture towards new technologies needs to be fostered (Kroop et al, 2015, p. 157).”

Graham Atwell, one of the authors, felt that MOOCs enable education to see other formats of online education and he expects to see new formats emerge: “The popularity of MOOCs has revealed a vast pent up demand for learning and at least in the form of the MOOCs has speeded the adoption of PLEs. MOOCs are in their infancy and we can expect the rapid emergence of other forms of open learning or open education in the next few years (p. 220).” MOOCs could be combined with other course formats, such as Blended or combined with teaching methods such as Virtual International Exchanges (VIEs) or Collaborative Online International Learning (COIL).

The commentary included the original definition of PLE (van Harmelen, 2006) and the redefinition of PLE, which is a “learning environment in which learners on the one hand actively integrate...
distributed digital information, resources and contacts, on the other hand document learning progress and learning outcomes based on standards” (Schaffert & Kalz, 2008). This implicates that there is not a full agreement on what PLE really is still. According to Marco Kalz: “It is essential for the further development of PLE and their impact in education that the community develops evaluation frameworks that can systematically handle the complexity of evaluating a personal environment that changes its status dynamically over time and can thus fulfill different purposes” (p. 227). Kalz explains that PLE should be more adaptive, something that perhaps will come with more time and research.

Application from ROLE project to VIEs and intercultural competency

The ROLE project included an inquiry discussion widget, which could be used in Virtual International Exchanges (VIEs) that use Moodle. It might be possible to use such a widget to eliminate the enrollment issues often noted in VIEs as a widget could be created and added to both universities so the students could interact in the discussion between the universities. Intercultural competence can increase during collaborative learning opportunities. Students who are able to interact with peers on various topics perform better in cooperative learning situations as described by McConnell (2000).

eBook Recommended

The reviewer recommends this book to colleagues interested in PLEs. The evidence provided in the book was thorough as it included the framework, the evaluation of the framework, four case studies, and the details of the technology used. The conclusions drawn are interesting and provide a global perspective. The book was well written and requires college level reading skills due to the high level academic focus. This elaborate project exemplified university partnership and collaboration. Case studies 2 and 4 lacked feedback from the participants. One possible improvement to the ebook could have been incorporating cultural aspects of the project. Collaborative learning could have been used and analyzed further in the project.

Summary

In summary, Responsive Open Learning Environments (ROLE): Outcomes of Research from the ROLE Project is an ebook that covered the Responsive Open Learning Environment (ROLE) Project between multiple universities. ROLE investigated and operationalized PLEs. PLEs could provide new outlets for online education. Student or participant responses could have been covered more in the book and how ROLE affects culture could have been explored. The academic book is commendable for the number of authors and universities represented and is recommend for those interested in OER.

References


