2020 Pandemic: Resilient Canadian Higher Education Institutions Will Integrate OER

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ABSTRACT

Can an increased integration of Open Education Resources (OER) in Canadian higher education support institutional resilience and best-practice in the wake of a pandemic? Concerns of institutional sustainability exist regarding eLearning and connectivity, learning outcomes, and finance. Resilient organizations adjust, and disruptive tools may help. OER present themselves as such an option, allowing for the free unrestricted adoption and adaptation of digital learning objects.
A meta-synthesis of peer-reviewed articles from G12 nations, link themes with the research question to explore applicability. Rogers' framework of the five attributes of innovation and tech diffusion guide a review of OER' Rate of Adoption.
This paper proposes that OER integration can positively affect concerns related to eLearning in Canadian higher education. Technology has permeated most aspects of daily living, more so in 2020 than before, and Canada can adapt to meet and exceed learner expectations.

Keywords: Open Education Resources, OER, Canadian Higher Education, COVID, Education

1. INTRODUCTION

Open Education Resources (OER) may provide Canadian higher education institutions opportunities to adapt in a pandemic ravaged society resiliently. Resilient organizations develop capabilities to anticipate, avoid, and adjust to disruptions and changes which could impact their sustained viability [1]. OER allow for the free unrestricted adoption and adaptation of learning objects, diffused with Information Communication and Internet-Based Technologies through five guiding principles of retain, reuse, revise, remix, and redistribute [2, 3]. Learning objects are "any digital resource that can be reused to support learning" [4]. A 2019 Canadian national survey indicates that institutions are currently in the early phases of OER integration, depending on the resource [5]. This paper explores whether further OER integration in Canadian higher education can support institutional resilience in the wake of the COVID-19 pandemic. Rogers' [6] framework of the five attributes of innovation related to tech diffusion will guide a literature review of OER adoption and their potential implications for the future.

As the novel COVID-19 virus has had a sustained impact on Canada, higher education institutions are fully adopting eLearning teaching methods to continue engaging learners [7]. The adoption of eLearning is not new, but the current situation is forcing further implementation at a rapid pace [7, 8, 9, 10]. The implications have generated concerns for institutional sustainability through eLearning. Notable issues include connectivity, learning outcomes, finance, and their collective impacts on planning and enrollment [5, 7, 11, 12]. As concerns fester, provoked by future uncertainty, best efforts must occur to address them proactively.

Higher education institutions may benefit from developing a formal strategic plan to include OER within their institutions to address concerns for purposeful use. Institutions that have adopted OER indicate positive learner experiences and learning outcomes [13]. OER such as audio/visual tools, blogs, courses, data sets, lessons, open textbooks, podcasts, and simulations can positively affect eLearning experiences [14, 15, 16, 17, 18]. This paper proposes that all Canadian higher learning parties impacted by COVID-19 can benefit through the purposeful diffusion of OER.

2. RESEARCH QUESTIONS

While there may not be a silver bullet that can address the beast that is COVID-19 as a whole, efforts can occur to address weaknesses currently permeating learning institutions. To explore whether OER may aid in the effort this paper looks to explore if the purposeful implementation of OER can support best practices aligned with Canadian higher education? To that end, what are their implications on connectivity, learning outcomes, and financial considerations? An exploration of the research questions will occur through a descriptive meta-synthesis of secondary research.

3. THEORETICAL FRAMEWORK

An exploration of the current status and future viability of OER in Canadian higher education occurs through Rogers' Rate of Adoption (ROA) from his research regarding the Diffusion of Innovations [6]. ROA consists of five attributes of innovation: relative advantage, compatibility, complexity, trialability, and observability, and refer to the time when an innovation is integrated within a network. Adopters can be categorized as innovators, the first 2.5%; early adopters, the next 13.5%; early majority, the next 34%; late majority, the next 34%; and laggards [6]. A 2019 Canadian national survey indicates that institutions are currently in the early-majority phase of open-textbook integration, and the early-adopter phase for other open resources [5]. Only the future can determine the impact the events related to COVID-19 will have on OER's ROA. At this time, what is known is that early reviews indicate notable alterations in teaching practices [11]. Though the situation is concerning, changes can occur to advocate for positive learning outcomes. An increased OER ROA would be ideal for helping bypass existing and future financial barriers of education [14].

4. RESEARCH DESIGN AND METHOD

A qualitative meta-synthesis regarding OER guided the collection, analysis, synthesis, and interpretation of the research literature. The meta-synthesis is a methodologically-grounded process utilized when linking themes derived from previous data-sets through a research question to make qualitative findings applicable for practice [19]. Following the procedure

outlined by Zimmer [19], six distinct phases include laying the groundwork, retrieval and assessment of primary research, meta-data-analysis, meta-method, metatheory, and meta-synthesis.

Article Collection

The collection of peer-reviewed articles focused on data related to the implementation of OER, and are derived from a search for 'open education resources' circa '2015+' in the ProQuest Summon platform via the Ontario Tech Library. Similarly financially-situated G12 nations guided geographic considerations. The related countries include Australia, Belgium, Canada, France, Germany, Italy, Japan, Netherlands, Spain, Sweden, Switzerland, the United Kingdom, and the United States. Studies included qualitative, quantitative, and mixed-method studies focused on implementation within higher education institutions. The original 18 articles yielded 12 for further review following the above criteria.

5. FINDINGS

Following a descriptive theoretical review, the initial coding process explores concepts and key phrases aligned within the theoretical framework. The themes linked for further synthesis include relative advantage, compatibility, complexity, trialability, and observability.

Relative Advantage

Relative Advantage is the level that an innovation appears to be better than the idea before it, expressed in the adopter's status by their impression of its impact on a related currency [6]. The integration of OER materials such as open textbooks and supportive learning materials can assist sustained or improved completion-rates, cross-cultural learning outcomes, quality, and education affordability. A study conducted by and through the University of Georgia, consisting of 21,822 student participants, sought to determine the impact of OER on completion, quality, and affordability related to student learning and student success [20]. The study results indicate that students enrolled in open textbook courses perform comparably or better than students in courses that use traditional commercial textbooks [20]. Further, the authors noted decreased withdrawal rates and improved learning outcomes for traditionally underserved learners and those in financial need as students collectively saved approximately $3,266,930 [20]. Researchers at Purdue University conducted a qualitative analysis of 2,602 students regarding final enrollment statistics, survey, and test results in a calculus course across two terms, one of which was supported by open textbooks, online homework problems, and audio/visual materials [21]. During the term with an OER textbook, student withdrawal rates dropped, while an analysis of assessment outcomes indicated similar learning outcomes regardless of their native language [21]. Further, the cumulative savings for students in the OER-supported term, totalled approximately $101,000 [21]. While considering the Relative Advantage of OER, decision-makers must plan to review content, accessibility issues, technology updates, privacy, and new research [17, 22, 23].

Compatibility

Compatibility is an adopter's relationship with an innovation related to existing sociocultural alignments, experiences, needs and compatibility with existing patterns and goals [6, 24].

Teachers can utilize the open data within their current curriculum through research- and scenario-based learning towards developing digital literacies, further supporting analytical and collaborative skills [15]. As instructors make efforts to integrate OER into higher education, the inherently collaborative nature between creator, host/distributor, and user positions them within sociocultural alignments and experiences [22]. Another affordance of OER is the ability to integrate the learner into course learning resource structures. Learners may themselves contribute to course content independently or collaboratively to create, reuse, revise, remix, or share learning objects through problem- or project-based learning or personal communication [15, 18, 25]. Aligning existing institutional pivotal players such as academic program chairs, instructional designers, librarians, and subject matter experts into teams for OER diffusion has been shown to ensure improved compatibility within existing frameworks [23]. Some issues that have occurred related to OER integration include personal preferences for tactile content, internet connectivity issues related to non-downloadable content, and ill-maintained links to resources [23]. Institutions may also look to consider their educators' attitudes to change and digital literacy skills [22, 23, 26]. The exploration may effectively support unfreezing previous education methods devoid of OER, and guide revised best practices for sustainability after their integration [27].

Complexity

Complexity relates to an innovation's adaptability in a continuum ranging from complicated to simple within a social system [6]. The complexity of OER integration will be relative to the resource and digital literacy of the implementor. A study conducted by Atenas et al. [15] indicates that utilizing open data in education can reduce complexity related to gathering large data sets, which can increase the accessibility, availability, and sharing of information [15]. OER can also reduce complications related to access to learning materials, notably at the onset of courses and financial or technological issues related to learning objects [20, 21]. For those looking to integrate open data, adopters' experience is less important than related competencies and critical thinking [15]. Anecdotally, adopters of audio/visual materials would benefit significantly with at least a basic understanding of graphic design or editing capabilities to fully embrace the 5-R's of OER.

Trialability

Trialability is the adopter's relationship with an innovation in the context of sampling versus full-scale use, where adopters who have the opportunity to try an innovation are more likely to assimilate it after a trial-period [6, 24]. Considering the ROA and diffusion of OER, the process of trialability can be explored at all institutional levels. Canada's Ontario Tech University implemented fully-online degrees while rooted in synchronous structures and supported wholly with OER [25], which can be observed by other schools and programs within the institution or reverted to traditional resources if mandated. The University of Maryland University College utilized an undergraduate program to trial open-textbooks as part of a textbook-replacement initiative to evaluate the implementation and best practices for further efforts [21]. Purdue and the University of Georgia both implemented courses entirely based in OER for consideration beyond the applied context [20, 21]. When looking to trial OER at any scale, it will be imperative for a successful and ethical trial review that instructors received the requisite training for usage to support experiential, legal, self-regulative, and

theoretical knowledge related to optimal efficacy [22]. Regarding learning outcomes and their relevance and quality, adopters must also ensure that information held within OER materials is maintained and up-to-date [21].

Observability

Observability considers perceptions of a social system, notably in the context of result-demonstrability or perceived relevance, on an innovations ROA [6, 24]. OER rely heavily on perceptions of a social system to be adopted, with educators afforded the opportunity to benefit and support the best ideas of peers and colleagues [22]. The increasing costs of education and the barriers they represent has already led many institutions to evaluate and adopt OER, notably open-textbooks [5, 17, 28]. The ROA of open-textbooks in Canadian higher education appears to be in the early majority of adoption [5]. However, the relationship of OER as an agent of change may make further integration contentious [22]. Some enthusiastic adopters may not critically review the content to ensure appropriateness, furthering concerns that OER may not be vetted to the same degree as more traditional materials [17]. There is also some concern about perceptions for OER use related to competition and enrollment statistics; however, exposure appears to decrease or minimize these negative attitudes [26].

6. DISCUSSION

Instructional designers don't have to adopt OER fully but can pick and choose. Implementation can include small-scale objects such as audio-video tools, web-based text, or even co-creation through open cloud-based platforms [29, 30]. The inherent and established nature of digital connection can play a crucial role in reducing educator time and stresses related to creating alternative avenues for connectivity. Learner connectivity is already a primary tenet of eLearning [31, 32] , and technology-supported connectivity is already actively utilized by many Canadians privately [33, 34].

Collaborative relationships and connections aligning institutions, teachers, and learners underpin OER adoption. An institution's and teachers' ability to engage and connect with students more effectively through OER can positively impact accessibility [22]. Learners also will personally seek and engage OER, sharing them with peers to achieve or support learning outcomes [18]. Problem- or project-based learning which utilize OER support collaboratively creating, reusing, revising, and remixing learning objects which impact learning outcomes [15, 25].

By further integrating OER, institutions can advance student success through a decreased dropout rate related to accessibility, and an increase in meaningful learning opportunities [20, 22, 35]. From the perspective of the educator, OER may offer the opportunity to access and integrate more modern learning materials or unique content to parallel or improve learning outcomes [21].

Financial concerns for academic engagement can be reduced through OER adoption. Open-textbooks alone can reduce student costs by ~90% [14, 36]. Further, decreased costs and increased global accessibility can positively impact enrollment in fully online courses allowing diffusion to remote areas, lifelong learners, and time-strapped individuals [21, 37]. Even considering that OER will require financial support, reduced learning materials costs and the ability to restructure education spending can improve education-related finances through enrollment and subsidized funding opportunities [14, 21]. Only

the future can determine the impact that COVID-19 will have on OER's ROA. However, reaching the late majority phase during a time that has demanded notable alterations in teaching practices would be ideal for helping ensure institutional viability [11, 14].

7. CONCLUSION

As Canadian higher education institutions are looking to adapt to the intra- and post-pandemic world, OER integration can positively impact best-practices, connectivity, learning outcomes, and financial concerns. Technology has permeated most aspects of life throughout recent history, more so in 2020 than any time prior, and Canadian higher education must adapt to meet and exceed learner expectations [9]. The global implication of COVID-19 on finance and education has been extensive [38, 39], and resilient institutions will integrate OER to reduce costs while simultaneously offering quality learning experiences proactively.

8. REFERENCES

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