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Creating Capacity for Digital Transformation of Education: Mode and Disciplinary Barriers in the Development of Highly Qualified Personnel

Hongran Cui (iD)
Thompson Rivers University

Valerie Irvine (iD)
University of Victoria

Mariel Miller (iD)
University of Victoria

Colin Madland (iD)
University of Victoria

Correspondence:

Hongran Cui
Thompson Rivers University
Email: mcui [at] tru.ca

Abstract

In recent years, the education sector has faced accelerated transformation toward the integration of technology, due in part to the global COVID-19 pandemic. While opportunities for specialized, advanced study in educational technology are a critical aspect of building capacity for system transformation, it is unclear to what degree doctoral-level training in this field currently exists in Canadian institutions and in what learning modalities study is provided. In this paper, we review university websites across Canada to determine the availability of online PhD programs in Education Technology. Results of this review revealed only one Canadian institution currently provides a PhD program in educational technology. While requirements for flexible access is a global trend, no doctoral programs with a specific educational technology focus are available online and only 15% of PhD programs in Education offer online or blended formats overall. While this review excludes the EdD pathway, we did find two EdD programs in educational technology that could be accessed entirely online plus one blended program. As technological and conceptual shifts of entire sectors that prioritize digital learning and digital literacy (e.g., BC Digital Learning Strategy), there is significant demand for PhD qualified individuals to lead, execute, or support these initiatives. As such, this paper concludes with reflection on alternative options for accessible PhD study of educational technology.

Keywords: PhD program, educational technology, accessibility, digital learning, higher education, online education, post-secondary education, graduate education, doctoral studies

Introduction

Over the past decade, education in schools and post-secondary institutions has become relentlessly more technological, with the global pandemic significantly accelerating this trend (Johnson, 2023). While technological advancements bring new opportunities for learning and teaching, they also create significant challenges. The complexity of digital transformation has prompted government initiatives, such as the Government of British Columbia's *BC Digital Learning Strategy* (2023), which aim to support educational systems to navigate this continuous change. The availability of specialized advanced study in educational technology is an essential aspect of building capacity for system transformation. Educational systems in both K-12 and higher education increasingly require professionals with advanced knowledge, skills, and competencies for serving in leadership, research, and teaching roles to support digital transformation. While master's and EdD programs provide critical skills and knowledge, PhD programs are uniquely positioned to build critical capacity for leading research and driving transformation in policy and practice. This is particularly important for executive leadership roles across sectors, many of which require or prefer terminal degrees. However, it is unclear to what degree doctoral-level training in educational technology is currently available at Canadian institutions to support the scope and complexity of this digital transformation. Moreover, while PhD programs are traditionally campus-based, there has been a global trend towards integration of online study pathways providing critical access to diverse learners, including historically marginalized populations, individuals with caregiving responsibilities, learners in rural locations, and professional learners continuing full-time employment while advancing their education (Ajayi, 2020; Scarpena, 2020). As such, the purpose of this review is to examine the availability of PhD programs in Education in Canada, with particular attention to area of study related to Educational Technology and online program modality.

Methods

To conduct this review, we searched the EduCanada webpage under the category of "Education," with the language of study set to "English" and the program level to "University - Doctorate," with no restrictions on location. EduCanada is the official Government of Canada website for international students seeking study programs and related information. We then reviewed the listed programs and visited the official university websites to confirm the specialization areas of each program, eliminating search results without an education focus.

Accessing the PhD in Education or Specialization in Educational Technology

Of the 20 PhD programs in Education found, Table 1 depicts the number of Education PhD programs in Canada, their program modality (e.g. on-campus, blended, online), and whether any specific program exists in educational technology. While specialized advanced study in educational technology is an essential aspect of building capacity for system transformation, results indicate that access to the educational technology PhD programs is limited in Canada. Specifically, only one PhD in Educational Technology exists (Simon Fraser University), and on-campus residency is required. Outside of this option, it is possible doctoral level study of educational technology may be available through a general education PhD program where a faculty member in educational technology is available to supervise. However, this pathway may be less desirable for those looking for programs where course specializations in educational technology are offered. Notably, online or blended pathways for doctoral study in education

appear to be exceedingly limited with one online program available in the Scholarship of Teaching and Learning at the University of Saskatchewan and one blended program available through Nipissing University, neither of which have an educational technology focus. Thus, the on-campus nature of these programs may limit access to diverse learners requiring flexibility in terms of program location to advance their education (Ajayi, 2020; Scarpena, 2020). EdD programs were out of scope of this review, but interestingly we found three EdD programs available in more flexible modes. Specifically, Athabasca University offers an EdD in Distance Education, Ontario Tech University offers an online EdD program with a focus on "Education in the Digital Age," and the University of Calgary offers a blended EdD program, with two-week summer residencies required in year one and year two.

Table 1

Characteristics of Canadian PhD Programs in Education

	Universities with PhD Programs in Education	**Modality**	**EdTech Focus**	**Province**
1	University of British Columbia	On-campus only	No	British Columbia
2	University of Victoria	On-campus only	No	
3	Simon Fraser University	On-campus only	Yes	
4	University of Alberta	On-campus only	No	Alberta
5	University of Calgary	Blended	No	
6	University of Lethbridge	On-campus only	No	
7	University of Saskatchewan	Online	No	Saskatchewan
8	University of Regina	On-campus only	No	
9	University of Manitoba	On-campus only	No	Manitoba
10	University of Toronto	On-campus only	No	Ontario
11	University of Ottawa	On-campus only	No	
12	York University	On-campus only	No	
13	Queen's University	On-campus only	No	
14	Nipissing University	Blended	No	
15	University of Western Ontario	On-campus only	No	
16	Concordia University	On-campus only	No	Quebec
17	McGill University	On-campus only	No	
18	Memorial University of Newfoundland	On-campus only	No	Newfoundland and Labrador

| 19 | University of New Brunswick | On-campus only | No | New Brunswick |
| 20 | University of Prince Edward Island | On-campus only | No | Prince Edward Island |

Alternate Avenues to Online Access

The findings of this review suggest a need to increase access to online PhD studies in educational technology. While limited options currently exist, we suggest that, if we broaden our horizons, there are alternative possibilities that can be considered. First, interdisciplinary programs offer much promise to address and adapt to challenging, multi-faceted issues such as digital transformation in education (Rashid, 2020). Interdisciplinary programs are designed from scratch with two co-supervisors, one from each of two different disciplines/departments. Graduate learners in Western Canada can access graduate courses through the Western Canadian Deans' Agreement (*Western Canadian Deans' Agreement*, 1974). By combining a mix of courses and directed studies, a PhD with a multi-faceted focus on technology and education could conceivably be completed at a distance. However, this pathway depends on the availability of courses relevant to doctoral study in educational technology, few of which are offered online.

A second option for creating access to online PhD study in educational technology is through joint PhD programs, which allow candidates to study in different universities domestically or globally, depending on the partnership between institutions. Similar to the interdisciplinary PhD program, it may be possible to custom design a fully online educational technology-focused PhD program. Although not educational technology-focused, Brock University, Lakehead University, and the University of Windsor have a joint PhD in Educational Studies. Furthermore, the University of Victoria provides opportunities for a jointly supervised PhD program and has faculty with active programs of research in educational technology, although partners can only be from recognized universities outside of Canada. Looking globally, Macquarie University has global PhD programs partnered with multiple universities from the United Kingdom, Belgium, Germany, China, and Thailand, but its PhD candidates should aim to divide their time equally between institutions, spending at least 12 months at each, either on campus or, in exceptional cases and with approval, offsite according to specific guidelines (Macquarie University, n.d., 2021). As many institutions have small numbers of educational technology faculty members, this option may provide the ability to work collaboratively to scale up a jointly supervised PhD program bringing together diverse areas of expertise related to educational technology comprised of courses offered across participating institutions.

Conclusion

Overall, to support digital transformation of education, we need to create more opportunities for advanced study to build capacity for system transformation. Going forward, we recommend that discussion is needed to critically evaluate how doctoral applicants can be provided with more accessible choices in educational technology, including how institutions can work collaboratively and what opportunities and challenges this may pose. As the nature of doctoral studies continues to shift, input on this question is required from multiple perspectives and voices, including students, administration, professionals, and faculty. Furthermore, we suggest

sponsorship or funding opportunities be sought out to help support these efforts. We encourage stakeholders interested in contributing to this conversation to connect with the authors or with OTESSA via grad@otessa.org.

Author's Contributions

HC and VI conceptualized, originated, and wrote the article. HC conducted the data collection and analysis. MM and CM provided input, revisions, and comments.

Open Researcher and Contributor Identifier (ORCID)

Hongran Cui iD https://orcid.org/0009-0001-9295-501X

Valerie Irvine iD https://orcid.org/0000-0002-8067-1300

Mariel Miller iD https://orcid.org/0000-0002-1705-4350

Colin Madland iD https://orcid.org/0000-0002-1761-1903

Ethics Statement

Ethics was not required as this is a conceptual paper.

Conflict of Interest

The authors do not declare any conflict of interest.

Data Availability Statement

The authors did not collect any data and only accessed publicly available data as reported.

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