

The Influence of Tradition, Context, and Research in Doctoral Degree Design

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Abstract

This paper examines the design of a doctoral degree in a technology-enhanced learning environment (TELE) as a form of design research. Research, policy, practice and design are key elements that can be mutually supportive in degree development. They are also elements that can evolve during doctoral program development if there is an open stance toward innovation. Designing and developing a degree involves significant research into the types of teaching, learning and assessment that have been shown to benefit students in TELE practice. Designers of education programs draw on methodologies from research, design and practice, employing common descriptors that are meaningful to informed audiences across disciplines. While the stages of the doctoral journey are easily recognizable, a design-based research approach can be employed to include innovation and reflection within degree elements and during stages of decision-making. In many ways, design-based research and doctoral program development mirror qualitative research, which has broader, more exploratory approaches embedded in its design. A qualitative research question often involves investigation or exploration (as opposed to an hypothesis). By nature, qualitative research design is formative, iterative, reflective and responsive, as different elements of the research design impact other elements as a phenomenon is explored. Researchers immersed in a qualitative study, or developers immersed in the design of a doctoral degree both participate in design through reflective processes. All of these factors contribute toward the synergies between design-based research and the development of a TELE doctoral education degree.

1. Introduction

The design of a new doctoral degree is significant, and the design of a new doctoral degree in the digital era that is built in the technology-enhanced learning environment (TELE), even more so. The doctoral degree has been described as royalty in the academic community (Schulman, 2008) because this degree signals that the doctoral recipient is ready to make the significant transition from student to teacher or from novice to independent scholar. In Canada, many of the students who earned doctorates in the past were first-generation graduate students; the largest proportion of doctoral graduates report parental education below high school completion (23% indicated that their mother had not completed high school and 20% that their father had not) (King, Eisl-Culkin & Desjardins, 2008). This implies that the doctorate is also a significant degree for upward mobility in Canada, which increases the significance of the degree and its implications for life chances.

The Carnegie Foundation recently devoted five years to studying the doctorate in the United States across disciplines, finding that it is an academic institution that brings stability and tradition and one that has prevailed for more than a century. The traditions of doctoral education can, however, be both stabilizing and stagnating forces, either supporting academic rigor or holding back the development of new doctoral degree designs through adherence to tradition. This paper examines the early stages of preparation of a doctoral degree that was proposed by a faculty with an already well-functioning TELE Master's degree in education. While examining the initial stages of the degree design, the authors demonstrate linkages to both design-based research and qualitative research design. They argue that the synergy between the degree's formative elements and the elements of design-based research contributed to improving the degree design in its initial stages.

2. Background

Ontario Tech University is a public research university in Oshawa, Canada. It is a young university at 17 years of age, committed to building strength and capacity through research, innovation and partnerships; it has a focus on preparing graduates for the workplace. One of the founding characteristics of Ontario Tech University was that information and communication technology (ICT) could prepare students for their future careers while providing a learning environment that would support innovative, student-centered learning and curriculum development. To that end, the university developed a comprehensive program of providing laptop computers and discipline-specific software to faculty and students. As well, there was a centrally-supported Learning Management System (LMS) and a synchronous teaching platform, both integrated with the Student Information System and Library. More recently, Ontario Tech University has expanded its support for learning to include Google Apps for Education, and a suite of online tools from Microsoft.

The centrally-supported TELE has shifted from focusing on hardware and proprietary software (licensed to individual machines) to a TELE landscape now populated with free and/or inexpensive online tools. These new tools provide more flexibility for licensing software given the reality that individuals want to choose their own computing hardware. As a result, the university has adopted a more flexible Bring Your Own Device (BYOD) ecosystem. With the advent of BYOD (students choosing to own and support their own devices), increasing use of free or inexpensive online tools, increasing use of mobile devices (Mobile phones and tablets) and the move away from a centrally supported technological infrastructure, the focus has shifted to the types of teaching and learning environments that support graduate student growth in online settings. When the university was formed, it had a mandate to become a research-intensive university and therefore to progress from undergraduate to graduate programs as quickly as possible. As a result, it grew from startup in 2002 to become one of Canada's top fifty research-intensive universities. It now has an undergraduate enrolment of close to 10,000 students with more than 20 graduate programs. The university builds research capacity through innovation and partnerships with over 300 industry partners.

The Faculty of Education at Ontario Tech University, which was established

also in 2002, initially offered teacher preparatory programs. As the faculty members advanced in their research, its research intensity grew, focusing on research in digital technologies and its intersections with education. The faculty established core expertise in teaching and learning using digital technologies as well as in other areas such as curriculum, leadership and policy. The Faculty established fully online Master of Education degree programs in 2009-2010. There are more than 300 graduates of these Master's programs (MA and MEd), many of whom expressed an interest in pursuing doctoral studies in TELE. When a recent survey was sent to Master's graduates, 99% of respondents indicated that they were interested in pursuing an EdD at Ontario Tech University. Given this response, faculty researchers chose to begin with an investigation of the EdD in the research literature and in Canadian universities.

3. Review of the Literature

Kot and Hendel (2012), in comparative research on professionally-focused doctoral programs in three countries, find that there is a shortage of scholarship on doctoral programs in Canada. The Canadian Association for Graduate Studies (CAG) recently authored two reports: one focuses on the doctoral dissertation in Canada (CAG, 2018) and the other focuses on the comprehensive exam (CAG, 2017). American scholars of the doctorate identify that the dissertation and the comprehensive exams are “rights of passage” to the doctorate (Estrem & Lucas, 2003, p. 396). Student participation in these ritual aspects of the doctoral degree are significant aspects relating to the socialization of graduate students. The CAG report on the comprehensive exam (2017) finds that these comprehensive exams have been in use for more than four decades in the United States, and the traditional structure of these exams persists. More recently, variations in the exam include a take-home exam, an article critique, portfolio, paper, or a dissertation proposal. CAG finds that the portfolio as an exam innovation “stands out from the rest” because it is iterative, and allows students to assess their development over time and within their own context (CAG, 2017).

The report on the dissertation (CAG, 2018) finds that doctoral programs in Canada are changing in response to changes in society and in the academy. While universities in Canada have not been reported to be moving at the pace of the *uberfication* of the academy in the UK (Hall, 2016) some currents of change in the doctoral degree are present in Canada. For example, the Canadian academy has taken note of the rise of the professional doctorate, which is a degree with a more practical or applied orientation. Another change is the growing recognition of policy analysis. One reported finding is that, while some Canadian scholars view policy papers only as “appendix-worthy” for a dissertation, others see the value in including policies as “significant artifacts that merit the student’s scholarly contextualization and analysis and the examiners’ assessment” (CAG, 2018, p. 11).

Findings from the CAG reports have implications for new doctoral programs. First, they indicate that most doctoral graduates are employed outside of the academy in, for example, research, teaching, policy development, entrepreneurship, consulting, communications and management. This indicates that the focus of the degree is more likely not for credentialing or job preparation

purposes. Secondly, employers report that doctoral graduates have much to offer, but may be too specialized or theoretical, or lack communication and teamwork skills. Consequently, programs for doctoral students need to help them create, apply and communicate their understandings to audiences outside the academy. This finding also indicates a need for more collaborative work for students during their doctoral program and less isolation (CAG, 2018).

Other issues for doctoral students in Canada include variable times for degree completion, high attrition, under-representation from some demographic groups, and variable supervision quality (CAG, 2018). These findings would point toward a need to design doctoral programs that have more of a student-centered focus, employ cohorts or similar types of structural support, built-in courses that support doctoral students in their research, and the early identification of a faculty sponsor, advisor, or supervisor.

Multiple countries are working to define educational doctorates in light of changing times and changing contexts (CAG, 2018; Kot & Hendel, 2012; Perry, 2012). In response to quality concerns (See for example Shulman, Golde, Bueschel & Garabian, 2006) the United States has established a distinct professional doctorate and other countries are joining this initiative (Perry, 2012, 2013). Perry explains that, the Doctor of Education (EdD) degree will be one century old in 2020 and has suffered at numerous points from what she terms an “identity crisis” (2012, p. 51). While the history of the degree has been often recounted (Hochbein & Perry, 2012; Perry, 2012) common elements of the history are instructive. Between 1870 and 1910, the programs of law, medicine and education began to transition from apprenticeships to formal doctoral degrees. Of these three, education had the most difficulty establishing itself. For example, at Harvard, there was disagreement whether the education doctorate should focus on the history and philosophy of education or on the study of administration. This debate delayed the introduction of the degree at the Harvard School of Education until 1920. Teachers College, Columbia offered its first PhD in education in 1893 and the first graduate convoked in 1899. The degree elements included educational psychology, history of education, philosophy of education, two practicum placements, graduate work in another faculty, and a dissertation showing independent thinking (Perry, 2012).

Confusion has surrounded the educational doctorate in multiple areas such as a) the focus for study (e.g., administration versus history and philosophy); b) comparisons between the PhD and EdD; and c) tensions between professors with academic backgrounds and those with professional backgrounds and experience (See for example, Levine (2007)). Nonetheless, throughout the debates, the research degree (PhD) was privileged and considered more prestigious than the professional practice degree (EdD). Shulman and colleagues (2006) cited earlier, argued that the design of the newest form of the EdD should have a zero-based approach to design without consideration of the earlier traditions of the doctoral degree. In order to define the EdD clearly and establish how research factored into it, the Carnegie Project on the Education Doctorate (CPED) was formed. Now it is a consortium of 105 EdD programs in the US, Canada and New Zealand (Perry, 2012).

According to Perry, the CPED defines the EdD as a professional research doctorate that requires students to investigate a particular professional topic or existing problem of practice. Constituent elements for this degree include the concept of the *scholarly practitioner* who works to address problems of practice.

The pedagogical approach is to be focused on the student and includes laboratories and internships. Using the model of *inquiry as practice*, they view the *dissertation* as a culmination of theory and practice. There are six guiding principles for the professional practice doctorate. The CPED:

- [1] Is framed around questions of equity, ethics, and social justice to bring about solutions to complex problems of practice;
- [2] Prepares leaders who can construct and apply knowledge to make a positive difference in the lives of individuals, families, organizations, and communities;
- [3] Provides opportunities for candidates to develop and demonstrate collaboration and communication skills to work with diverse communities and to build partnerships;
- [4] Provides field-based opportunities to analyze problems of practice and uses multiple frames to develop meaningful solutions;
- [5] Is grounded in and develops a professional knowledge base that integrates both practical and research knowledge, and that links theory with systemic and systematic inquiry;
- [6] Emphasizes the generation, transformation, and use of professional knowledge and practice (Perry, 2013).

In summary, then, while there remains some overlap in definitions of EdD programs and PhD programs, the U.S. has established a distinct professional doctorate and some other countries are joining this initiative.

4. Theoretical Framework

This section introduces conceptions of different types of design-based research for higher education and for TELE programs, then aligns the theory of design-based research in technology-based learning and higher education, comparing it to the processes used for the development of the early iteration of the EdD degree at Ontario Tech University. Collins (1992) is cited as being the first to propose a design science of education. He saw physics and biology for example as analytical sciences that explain natural phenomena. He saw artificial intelligence more as a design science that examines how artifacts behave in different conditions. He proposed a design science for education that would examine how the designs of different learning environments affect some of the dependent variables in teaching and learning (Collins, Joseph & Bielaczysz, 2004).

Van den Akker (1999) similarly proposes that development research should begin with a review of the literature, consultation with experts, and analysis of examples, as well as case studies of current practice. There should also be collaboration with the research participants and systematic documentation and analysis of both the process and the outcomes of the development project (van den Akker, 1999).

Kennedy-Clark (2013) theorizes design-based research and research for higher education degrees, which she terms the Higher Degree Research (HDR) experience (p. 26). She finds that design-based research lends itself to education because it considers technological tools and curriculum within grounded settings that lead to deeper understandings of teaching and learning. Design-based research

examines the process, and employs cyclic and iterative processes to continually examine process and product, although design-based research is generally a series of approaches, not a single approach. According to Kennedy-Clark, design-based research looks to refine theory and practice by examining the outcomes of varied learning environments and then shift practice to achieve the desired learning outcomes (Kennedy-Clark, 2013). In this way, her theory of design research aligns with that of Collins (1992).

Reeves (2006) finds that design-based research can be encouraged in student research in higher education because its fundamental principles support higher education outcomes in TELE. For example, Reeves finds that design-based research:

- 1) Can address complex problems in real contexts in collaboration with practitioners;
 - 2) Can integrate design principles with technological advances to find workable solutions;
 - 3) Can support rigorous inquiry to test and refine innovative learning environments
- (Reeves, 2006).

In summary, design-based research can be instructive in TELE (Kennedy-Clark, 2013; Reeves, 2006; Wang & Hannafin, 2005). Initially, TELE did not have a significant uptake in educational communities (See for example, Cuban, 1986). Wang and Hannafin (2005) argue that one of the reasons that technology uptake was initially slow can be explained by the separate approaches to design, research and practice in TELE initiatives. They consider that within the design-based research paradigm (Brown, 1992; Collins, 1992), research and design are used collaboratively to refine and improve designs as well as to advance the aims of theory and practice in education. Researchers are both designers and researchers who make concurrent improvements in research, practice and theory (Wang & Hannafin, 2005). Today, students who are immersed in TELE can use the technology to work collaboratively within online communities of practice (Anderson, 2008) and take full advantage of the TELE.

Wang and Hannafin define *design-based research* as “a systematic but flexible methodology aimed to improve educational practices through iterative analysis, design, development and implementation, based on collaboration among researchers and practitioners in real-world settings and leading to contextually-sensitive design principles and theories” (p. 6). When design-based research is pragmatic, it includes both theory and practice, and theory is applied to improve practice. When design-based research is grounded, it is relevant, conducted in real-life examples and the design-based research is embedded within it. The designers undertake continuous iterative cycles of analysis, design, implementation and redesign. The methods of gathering data should change to meet needs as they arise and the process should be well-documented (Wang & Hannafin, 2005).

Collins et al. (2004) find also that there can be challenges associated with design-based research. Because it is not experimental in nature, and a more innovative research design, it can be questioned by the research community. In addition, design-based research tends to examine highly complex problems such as the implementation of problem-based learning in schools.

5. Application of theory into the new EdD

In this section of the paper, the authors apply Wang & Hannafin's design-based research principles in TELE projects to the development of the new doctoral program at Ontario Tech University. These findings are presented in the Table 1

6. Findings

The research findings reported here are based on the authors' examination of public websites in Canada for EdD and PhD in Education programs and the early drafts of the proposed new EdD for Ontario Tech University. Based on degree descriptions online, there is some alignment in Canadian doctoral programs with elements of design-based research principles. It bears mentioning, however, that there are distinct crossovers in descriptions of EdD and PhD in Canada. Most PhD programs in education emphasize the building of scholarly practitioners. The PhD program at Queens University states that students develop leadership abilities, including critical reflection, research and writing, with a focus on personal development. The University of Windsor states that its PhD program in education nurtures students as developing scholars and leaders in faculties of education, school systems and institutions. The PhD program in leadership and policy at the University of Toronto states that it is designed to develop "thoughtful and highly skilled educators, administrators, policy analysts, and academic practitioners." Nipissing University's PhD in Education reports that it focuses on preparing students from a variety of fields for sustainable educational practices in the 21st century. These expressions about scholarly practitioner preparation, common to both PhD and EdD program descriptions, lead to a finding that PhD and EdD programs in Canada are deemed both equivalent and different. This finding matches earlier findings that the PhD and EdD are seen in Canada to have strong similarities (See for example Belzer & Ryan, 2013). These elements also indicate that the degrees are grounded in practice, which aligns with design-based research tenets.

Similarly, other Canadian institutions offering EdD programs describe their programs as opportunities for students to engage in scholarly discourse about understanding, critiquing and improving practice (UBC). The University of Calgary states that its EdD program is designed for practicing professionals who will develop new leadership skills, engage in scholarly discourse and carry out field-focused research. Fifteen of the universities in Canada examined offer some form of Leadership Studies for the educational doctorate, indicating that this is a preferred program nationally. In addition, some programs require evidence of professional experience with one university requiring five years as a minimum. We find that, based on descriptions, these programs match the specifications for the design-based research because they are pragmatic, grounded and encourage doctoral students to research in contexts that they know and understand as practitioners.

Table 1. Findings based on Wang & Hannafin's design-based research

Characteristics of Design-based Research (based on Wang & Hannafin, 2005)	Reflections on the proposed EdD Program
<p>Pragmatic: Theory is linked to practice, but the research should refine both theory and practice (Collins et al., 2004)</p>	<p>The EdD proposal uses foundational theories such as the Fully online learning community (FOLC) model (vanOostveen et al., 2016). Course proposals include problem-based learning and communities of practice. Student learning approaches in the degree focus on collaboration and co-construction of knowledge. Other theories are assumed but may not be explicit.</p>
<p>Grounded: The proposal is grounded in relevant research, theory and practice. A theory about learning and instruction is in place. Research is conducted in real-world settings. There is a recognition of design-based research (Wang & Hannafin, 2005).</p>	<p>Doctoral student research will focus on existing problems of practice. The focus on design-based research in TELE could be more explicit. The median time to doctoral degree completion has been calculated at 5 years, 4 months (King et al., 2008). The EdD has been designed to support students through their research by aligning courses and the candidacy exam with the research process.</p>
<p>Interactive, iterative, and flexible: There is a cycle of analysis, design, implementation and re-design.</p>	<p>Ontario Tech University has an office of quality enhancement that reviews degree proposals and suggests changes to them to maintain rigor. The province of Ontario has quality assurance processes for advanced degree approval. Within these processes, there are two opportunities for faculty to formally approve the proposal and multiple opportunities to make iterative adjustments.</p>
<p>Integrative: Mixed methods are used to augment the credibility of the ongoing research. Retrospective analysis and formative types of evaluation are considered.</p>	<p>While there has been faculty and senior administration input into the design of the EdD, there has not been an opportunity for student input. Forms of ongoing formative evaluation will monitor issues with degree completion. Ongoing student review can be considered in program design.</p>
<p>Contextual: Education is complex and education in TELE may be more complex and dynamic. Because of this, there may be issues with online learning that need to be considered.</p>	<p>An early reviewer of the proposed program asked how doctoral supervision would happen in a fully online learning community. This is an example of the type of contextual issues that may emerge during doctoral design in TELE and can be made more explicit in the design.</p>

With respect to the characteristics that Kennedy-Clark (2013) identifies for design-based research in higher education, we find gaps with respect to Canadian doctoral programs and innovative TELE teaching and learning initiatives. Athabasca University describes itself as a professional doctoral degree intended

for distance education practitioners and those with career experience with distance education, but little mention is present in the literature with respect to innovative TELE designs for higher degrees. At the 15 universities surveyed, the majority of the programs (15 of 18 programs) were offered on campus. One was completely online with a face-to-face (F2F) orientation (Athabasca). One specifically discussed blended learning (Western). Others mentioned some combinations of blended learning. Five programs had the combination of some online courses and some F2F, with yearly cohorts or residencies (Calgary and UBC). In this respect, the review to date on Canadian programs has not shown much of an influence of TELE on teaching and learning in the doctorate in Education.

There was stronger evidence of the importance placed on research for the doctoral degree, although none of the programs reviewed specified design-based research. All programs investigated require applicants to hold a Master's degree with good academic standing. Others express a preference or a requirement for previously completed research. Where a student completed a course-based Master's without research, one university requires a qualifying research project. The EdD in Higher Education at the University of Toronto requires that applicants provide evidence of ability to define a research question, devise a research design, and analyze and report research findings with academic rigor. Canadian doctoral programs that do not require some evidence of prior research are in the minority. So, while an emphasis on design research was not established, universities in Canada place a high priority on grounded research in doctoral programs in education.

The authors find that Canadian universities recognize to some extent that EdD applicants have diverse experiences gained from their Master's degrees, and universities are making accommodations to bridge from the course-based Master's programs to prepare students for the rigorous research expectations of doctoral programs. The authors also reviewed the requirements for principals, superintendents and director positions across Canada. While the Master's degree is a requirement in some provinces and territories for school leadership or college professorship, the authors found no instances where policies require an EdD for senior administrative positions. One province requires certification beyond the Master's degree for a superintendent position – the Supervisory Officer's Qualifications Program in Ontario. This finding should encourage those universities offering EdD programs, particularly in Ontario to consider ways to accommodate applicants who have significant certification beyond a Master's degree.

In summary, there is a scarcity of research on educational doctorates in Canada but there are distinct, multiple aspects that contribute to the Canadian identity. There are elements of federal emphasis in Canadian education such as the Charter of Rights and Freedoms, the Official Languages policy and expectations for education arising from the Truth and Reconciliation Commission. The responsibilities for education in general rest with the thirteen provinces and territories although universities occupy a unique inter-jurisdictional environment between the federal government and provinces. For example, different provinces recognize religious schools for public funding in different ways. Similarly, the preparation of school leaders differs from province to province. Ontario has a school leadership framework. This means that Canadian EdD applicants will have different levels of preparation depending on their province of origin and their Master's degrees.

7. Conclusions and Recommendations

The design-based research collaborative (DBRC, 2003) finds that design-based research can help to create and extend knowledge about developing, implementing and sustaining learning environments that are innovative and cutting edge. While Ontario Tech University does not mention design-based research explicitly, there are elements of design-based research in its TELE programs, The Faculty of Education has developed innovative programs where students and instructors work fully online in synchronous classes. Within fully online learning communities, their students build cognitive presence and social presence as they work collaboratively (van Oostveen et al., 2016). These required skills for most future work can be employed to assist EdD students with significant elements of the proposed doctoral program. Within the current context of existing and emerging EdD programs across North America, Ontario Tech University continues to examine the multifaceted aspects of doctoral studies and the emerging trends regarding the necessities for professional leaders, research orientations, and changes in the needs of the marketplace, while respecting the rigors expected of any academic degree at the doctoral level. As the Faculty of Education continues to architect its EdD, it will be informed both by existing degree iterations and its own faculty specific desires to ensure students are well prepared to take on leadership roles within education. Thus informed, Ontario Tech University is poised to design a unique, Canadian EdD degree.

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