INNOVATIVE CERTIFICATE PROGRAMS IN UNIVERSITY TEACHING AND LEARNING: EXPERIENTIAL LEARNING FOR GRADUATE STUDENTS AND POSTDOCTORAL SCHOLARS

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In response to a growing need for graduate students and postdoctoral scholars to strengthen their teaching and learning skills, our university recently established innovative certificate programs that purposively incorporate experiential learning opportunities for deeper growth and development. Drawing on prior research and local needs assessments, we developed programs aimed to meet the identified needs of graduate students and postdoctoral scholars. In this paper we describe how we planned, developed, and implemented these new certificate programs to engage graduate students and postdoctoral scholars from across our institution. Further, we discuss how these programs provide experiential learning opportunities for all participants.

The development of scholarly teaching and learning knowledge and skills is an important feature of a well-rounded academic experience for graduate students and postdoctoral scholars and is recognized as important in a highly competitive job market (Åkerlind, 2005; Britnell et al., 2010; Canadian Association of Graduate Studies, 2008; Kenny, Watson & Watton, 2014; Rose, 2012; Rybarczyk, Lerea, Lund, Whittington, & Dykstra, 2011). Along with the need for developing teaching and learning skills, experiential learning has also become increasingly prioritized in higher education settings. Graduate students and postdoctoral scholars are requesting relevant and meaningful learning experiences to develop important skills required in today's changing workforce (Åkerlind, 2005; Rybarczyk et al., 2011).

Non-credit certificates in teaching and learning are one way to support the professional learning and development of these emerging scholars and provide clear credentials relevant in both academic and non-academic careers (Osborne, Carpenter, Burnette, Rolheiser, & Korpan, 2014). In recent years, a number of Canadian universities have implemented a variety of certificate-based teaching development programs for graduate students (Kenny et al., 2014) however, certificate programs for postdoctoral scholars are not yet commonplace. While many certificate programs across Canada emphasize the development of practical teaching skills, learning is often assessed through measuring attendance without providing formative or summative feedback on the knowledge, skills, or values the individual develops during the certificate program, particularly during the experiential learning elements (Kenny et al., 2014). Authors have encouraged the use of more authentic learning experiences and measures of achievement within certificate programs (Kenny et al., 2014). Informed by a review of the literature, an environmental scan, a local needs assessment, and a multi-stage institutional-level

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feedback process, our university recently implemented two teaching development certificate programs that purposefully integrate experiential learning experiences – one for graduate students and one for postdoctoral scholars.

Experiential learning emphasises the development of "real world skills" through hands-on and applied learning opportunities which have a positive and powerful impact on the quality and meaning of learning experiences (Bass, 2012). There is sound pedagogical evidence for incorporating experiential approaches into certificate programs. Kuh's (2008) influential research on high impact practices demonstrated experiential learning experiences have significant impact on students' overall academic success. Further, employers often seek job applicants with the leadership, communication, and problem-solving skills that can be developed through well-designed, effective experiential learning opportunities (Roberts, 2018). Finally, the emerging field of the learning neuroscience supports experiential learning as being key to long-term memory acquisition (Ambrose, Bridges, DiPietro, Lovett, & Norman, 2010). As noted by Kolb and Kolb (2009), "when a concrete experience is enriched by reflection, given meaning by thinking, and transformed by action, the new experience created becomes richer, broader, and deeper" (p309). Because we aimed to enhance the relevance and applicability of our program outcomes, we purposefully integrated experiential learning opportunities within our certificate programs.

The certificate programs are structured to provide practical, flexible, and adaptable learning experiences grounded in evidence-based knowledge about teaching and learning that is relevant across disciplines in postsecondary contexts. Participants engage in holistic and multi-faceted experiential learning activities to explore challenges in relation to teaching and learning, reflect on these challenges, and engage in deeper learning and meaningful growth. Participants demonstrate learning through the effective completion of authentic teaching and learning tasks that move beyond the traditional attendance and participation accreditation and allow both facilitators and participants to gauge the learning occurring in the program (Gulikers, Bastiaens, & Kirschner, 2004; Kenny et al., 2014). Further, these certificate programs provide participants with opportunities to enter into significant conversations about teaching and learning that extend beyond their departments, disciplines, and faculties (Roxå & Mårtensson, 2009). In this paper, we explain how these programs provide authentic, experiential learning opportunities for graduate students and postdoctoral scholars (Ashford-Rowe, Herrington, & Brown, 2014). With permission of the participants, we have included exemplars of student learning to highlight the outputs of the experiential learning opportunities.

UNIVERSITY CERTIFICATES IN TEACHING AND LEARNING

To receive a University Certificate in Teaching and Learning, participants must complete five digital badges, each of which includes an experiential learning component.

1. Emerging Teachers Development
2. Scholarship of Teaching and Learning Foundations
3. Theories and Issues in Postsecondary Teaching and Learning
4. Learning Spaces and Digital Pedagogy
5. Developing Your Teaching Dossier

Digital badges are icons or symbols that indicate an accomplishment or skill. A form of micro-credentialing, they can be used to recognize and evidence informal learning accomplishments that are not realized through formal accreditation processes (Devedzic & Jovanovic, 2015) at a more granular level than credit courses or degrees (Gamrat, Zimmerman, Dudek, & Peck, 2014).

They represent a shift in professional learning development from attendance-based to criteria-based accomplishments, requiring participants to provide evidence of their learning rather than attend a minimum number of hours of training (Casilli & Knight, 2012).

While each badge program has a unique focus, the following certificate-level learning outcomes guide the design and assessment of all programs. Throughout the course of these non-credit certificate programs, successful participants will:

- engage in collaborative, critically reflective conversations with colleagues to explore current issues, theories and research in postsecondary education;
- identify and implement research-informed teaching methods that enhance participant learning;
- practice peer teaching, and collecting and responding to feedback from colleagues;
- articulate a research question and develop a plan to conduct a SoTL project;
- evaluate, select and integrate effective learning technologies and maximize spaces to enhance participant learning; and
- develop a teaching philosophy/dossier that aligns key beliefs about teaching and learning to sources of evidence drawn from participation in the certificate program.

Emerging Teachers Development

The Emerging Teachers Development (ETD) program is a series of workshops providing a comprehensive evidence-based program for graduate students and postdoctoral scholars. Participants reflect on, identify and implement research-informed teaching methods that enhance both their learning and student learning. Face-to-face sessions focus on topics and skills for teaching in higher education including effective communication, active learning, formative feedback strategies, and writing learning outcomes.

Workshops were intentionally developed to address competencies for teaching development. Each interactive workshop is two hours in length and offered throughout the academic year to allow participants ease of access. Facilitators from our teaching and learning institute and related faculties model active and engaged learning. Throughout the ETD program, participants engage in a variety of interactive learning activities including small group discussion, individual and group work, technology applications and guided individual reflection.

To earn a digital badge in the ETD program, participants attend a minimum of five workshops and write a summary reflective statement (two to three pages in length). Throughout the program, participants are encouraged to reflect on their learning and are provided resources for this process. Questions guiding the reflective statement encourage participants to reflect on what they learned, how they would apply it, and how their beliefs about teaching and learning are developing:

- Describe your key learnings from the five workshops.
- Describe how your beliefs about teaching and learning evolved and/or changed.
- Describe why your beliefs about teaching and learning evolved and/or changed during and/or following the workshops.
- As a result of attending the workshops, describe what skills or strategies you have, or plan to implement in your practice, now or in the future.

Exemplars of learning.

Because reflective practice is a hallmark of effective postsecondary teaching (Brookfield, 1995), and especially powerful in improving the quality of learning related to experiential

opportunities (Ash & Clayton, 2009: Kolb & Kolb, 2009), a summary reflective statement was selected as an authentic task for participants to demonstrate their learning. Overall, participants' reflective statements provide insight into their learning experiences and their teaching development; the richness of these reflections demonstrates the effectiveness of the ETD program.

> ***Excerpt from a reflective statement.*** (Postdoctoral Scholar, Faculty of Kinesiology)
> I have become much more reflective in my teaching strategies and philosophies. I feel I have a better understanding of the importance of reflecting on what worked, what didn't work, and always striving to improve my delivering and student engagement during instructing and mentoring.

> ***Excerpt from a reflective statement.*** (Graduate Student, Faculty of Arts)
> I plan to continue to reflect and experiment on my teaching practice with strategies I learned from the workshops over the course of the next academic year. The workshops helped me reflect on my own experiences more critically, and also exposed me to strategies I had not considered. I realized that by asking engaging questions and choosing the right discussion strategy, I am able to reach students who might not otherwise have been as engaged as I was. The most important change that I have made to my teaching practice is to be more deliberate about considering what I expect students to take away from the classroom, and what evaluation and teaching methods best support those outcomes.

Scholarship of Teaching and Learning (SoTL) Foundations

The Scholarship of Teaching and Learning (SoTL) Foundations Program is a workshop-based program intended to introduce participants to the field of SoTL and to provide opportunities to begin asking meaningful questions about their own disciplinary teaching and learning experiences. Engagement in SoTL is demonstrated to strengthen instructors' approaches to teaching, and to improve student learning experiences (Brew & Ginns, 2008; Trigwell, 2013). To earn the digital badge, participants

- attend an introduction to SoTL workshop,
- participate in four discussion-based sessions, as a cohort with their colleagues, organized around key SoTL readings,
- attend two workshops focused upon recurring or emergent themes in SoTL (such as ethics in the scholarship of teaching and learning or partnering with students), and
- articulate a research question and develop a plan to conduct a SoTL project.

The discussion-based workshops include a combination of individual, small-group, and whole-group active learning strategies. Including creative modes of representing thinking and popular social media representations of teaching and learning helps participants expand their repertoires to imagine learning beyond conventional lecture or discussion-based engagement. The workshops allow participants to engage with recurring or emerging questions they will likely confront when they research teaching and learning

Exemplars of learning.

For the final experiential learning task, participants engage in a meaningful way with a question about teaching and learning that piques their curiosity. They are asked to draw from their methodological training and teaching and learning experiences to develop a SoTL plan - a 'real world' task for teaching faculty in higher education (Hutchings, Huber, & Ciccone, 2011).

For example, past participants have designed plans to investigate the benefits of virtual reality as a visual learning aid as well as how courses can be redesigned to facilitate greater student engagement.

> ***Example of proposed research questions*** (Postdoctoral Scholar, School of Medicine)
> What are students' perceptions of engagement in introductory research methods courses? How can an introductory research methods course be redesigned to facilitate greater students' engagement? Can providing learners with increased application, including some flexibility and control of learning material, enhance engagement and learning?

> ***Reflection on SoTL foundations readings*** (Graduate Student, Faculty of Science)
> The most influential in changing my thinking were Felten's principles, as I would never have thought of including students in the SoTL process. Bass's paper was the other invaluable paper. I found it useful for creating a mental framework to understand the problems I was seeing in my lab. This is critical for being able to come up with a SoTL project.

Theories and Issues in Postsecondary Teaching and Learning

This program was designed to provide opportunities for participants to engage in conversations around important issues in postsecondary education as well as to develop the pragmatic skills of designing student-focused lessons, leading learning activities, and collecting feedback from learners (in this case, their peers in the program). Because meaningful conversations and peer teaching involve a degree of vulnerability (Roxa & Martensson, 2009), we developed this program as two distinct cohort-based series, separating graduate students and postdoctoral scholars. We also recognize the value of building communities and connections, particularly among postdoctoral cohorts who can face considerable isolation in their work (McAlpine, Wilson, Turner, Saunders, & Dunn, 2017; Jairam & Kahl, 2012). To earn the digital badge, participants

- attend four required cohort sessions
- participate in one of a selection of optional workshops, and
- plan, lead, and receive feedback on a learning activity for their cohort peers.

The required sessions focus on the specific skills needed to be effective in the authentic teaching task of designing and leading a learning activity. They include an overview of learning science, planning for diverse learners, and giving and receiving feedback in academic settings.

The optional workshops are offered by a wide range of facilitators from our institute as well as from across campus. Each option emphasizes a significant teaching and learning issue such as mental health and wellness, teaching controversial issues, and promoting self-regulated learning. These workshops provide relevant information and provoke important critical reflection.

Exemplars of learning.

The peer teaching activities are designed to be an experiential learning opportunity where participants from multiple disciplines gather and individually lead activities focused on a theory or issue of broad interest in higher education. Guided by Bowen's (1987) theory of experiential learning, we created an environment of safety where participants assessed themselves, tried out new teaching techniques, and provided and received feedback from their peers on the results of their teaching experience. Some of the learning activity topics include inclusivity in higher education, questions in the classroom, academic integrity, and classroom assessment techniques. Participants lead short, active lessons and collect feedback from their peers. The aim is to

encourage the ongoing practice of instructors collecting feedback from their students to guide their teaching development (Gormally, Evans, & Brickman, 2014).

Example lesson plan. (Postdoctoral Scholar, School of Medicine)
Lesson title: Multiple views on multiple choice exams
Learning objectives: By the end of this session participants will be able to:

- List and explain some strengths and weaknesses of multiple-choice exams
- Explain at least one alternative method of delivering multiple choice exams

Learning activities:

- Evaluate participant views on multiple choice exams through a line-up icebreaker
- Brainstorm pros and cons of multiple-choice exams from both the students and instructors' perspectives
- Mediated forced debate

Example lesson plan. (Graduate Student, Faculty of Arts)
Lesson title: Implementing retrieval cues in test writing
Learning objectives: attendees should be able to:

- Define retrieval cues
- Understand the value of retrieval cues for student learning
- Implement the use of retrieval cues in their own test writing

Learning activities:

- Comparing crossword puzzle cues and retrieval cues
- Small group discussion
- Guided pair practice

Learning Spaces and Digital Pedagogy

The Learning Spaces and Digital Pedagogy (LSDP) program focuses on the intentional use of learning spaces and the integration of technology into teaching and learning practices. Learning in higher education occurs in a spectrum of environments from classrooms to online, while a range of learning technologies can be integrated into any of these environments to foster meaningful student learning experiences. Although learning technologies and learning spaces can be looked at separately, they are often discussed in conjunction as they can positively influence student learning (Parsons, 2016; Hamilton, Rosenberg, & Akcaoglu, 2016). The LSDP program uses a blended approach as participants attend workshops and complete the online requirements at different times; thus, the online space provides an important opportunity for facilitators and participants to build relationships and community (Garrison & Vaughan, 2008). To earn the digital badge, participants:

- attend a minimum of four workshops,
- participate in an online peer discussion of their learning, and
- design, share, and reflect on a learning activity that integrates both learning spaces and technology.

Workshops are offered in face-to-face, blended, and online formats and include topics such as video authoring and digital storytelling, flipped learning, interactive digital game design, and using learning spaces for collaboration.

Exemplars of learning.

Games and simulations offer significant forms of experiential learning that often trigger powerful learning experiences (Thatcher, 1986). Online, participants develop and share innovative and creative student-centred teaching and learning methods including instructional podcasts (Green, Pinder-Grover, & Millunchick, 2012), flipped learning resources (Bergmann & Sams, 2012), and educational games (Kebritchi & Hirumi, 2008; Rooney, 2012). This online space is critical in providing participants with an experiential learning opportunity to try new ideas, learn from others, and reflect on their practices (Kolb & Kolb, 2009).

> ***Interactive 2D game design.*** (Postdoctoral Scholar, Faculty of Arts)
> I am designing a course called "Critical Zone Science Field Course" where students are required to demonstrate the key components of the critical zone and use technology for public outreach. In this assignment, students will create a video, game, and online-story board to engage the public in Critical Zone science. Thus, this game will provide an example to the students, contributing to these learning objectives. I posted this game online as an educational game, so anyone can learn more about the Earth's Critical Zone. The online the learning objective was to identify and locate five elements of the critical zone.
>
> ***Screencast recording for flipped lesson.*** (Graduate students, School of Medicine)
> I created a 7-minute video of p-values using an example. The video discussed what p-values do and do not mean and why they are important. Since posting the video I have had several comments from students that they found the video useful and wonder if I'll make more in the future. This is a first step to creating a flipped lesson.

Developing your Teaching Dossier

In this blended badge program, participants are divided into separate cohorts to meet the unique needs and career development stages of postdoctoral scholars and graduate students. During online and face-to-face sessions, participants are introduced to the principles and components of teaching philosophy statements and teaching dossiers. Teaching dossiers build upon and integrate teaching philosophy statements to provide evidence that highlights teaching and learning approaches, accomplishments, and effectiveness (Knapper & Wright, 2001; Seldin, Miller, & Seldin, 2010).

Understanding the teaching philosophy statement to be the thesis around which a teaching dossier is built (Schonwetter, Sokal, Friesen & Taylor, 2002), participants are provided with online resources, encouraged to find additional teaching philosophy resources to share with their peers, and asked to develop a draft their teaching philosophy statements. To further enhance this experiential learning opportunity, participants discuss and develop principles and guidelines of peer review processes, a required skill in higher education. Working in small groups to give and receive feedback on their teaching philosophy statements, participants can identify areas of strength and opportunities for further edits and growth. This model of online learning, individual drafting and peer reviewing is repeated as participants develop their teaching dossiers.

Exemplars of learning.

By the end of the Developing your Teaching Dossier program, participants create organized, integrated, and cohesive dossiers that highlight their current (or future) teaching practices. Teaching dossiers are a powerful method of documenting, facilitating, and providing evidence of experiential learning processes and place a clear emphasis on lifelong and reflective learning (Knapper & Wright, 2001). Applying for an academic job often requires a teaching philosophy statement and/or dossier, so developing these documents is authentic to both the

program and to participants' immediate needs. Participants who complete all online and face-to-face components and submit a draft of their teaching dossier are eligible to earn the digital badge.

> ***Excerpt from a teaching philosophy.*** (Postdoctoral Scholar, Faculty of Kinesiology)
> I reflected on my own experiences as a student and realized that there were teachers that I had looked up to, and I wanted my future students to say the same about me. I was not naïve enough to expect it would be easy to become that teacher, and in the ten years since then I have used mentors, teaching workshops, books, and my own teaching experiences to develop skills toward achieving this goal. However, I rely on the student perspective to develop my teaching philosophy: Great teachers have contagious energy, emphasize the thought process over correct answers, and invest in student success.

> ***Excerpt from a teaching philosophy.*** (Graduate Student, Faculty of Arts)
> Equally important to me is my commitment to continuous improvement through formative feedback that I can collect through self- reflection, student feedback, and colleagues' feedback. In the past, I always wanted to have my students engaged, but I did not know how to do this or to assess whether I was successful in doing this. I used to think of students' attendance and submitting their assignments as the only indicators that students are engaged. After the professional development activities that I have been involved in at Taylor Institute for Teaching & Learning at University of Calgary, I can use different methods to engage students such as having meaningful, relevant, and accessible content and interesting and interactive activities. I will ask for my students' opinion on how I do things and how they can be done in a better way, which will certainly engage my students. Self-reflection and taking notes on how classes and assignments go are a valuable source to me for continuous improvement and learning from the past.

EVALUATION

Once participants have completed all required components of a badge program, they are asked to rate on a scale of 1-5 (from strongly disagree to strongly agree) to what extent

- the subject matter presented in the badge program is relevant to their current or future teaching experiences;
- the teaching and learning strategies used in the program were helpful;
- they will be able to apply the material presented and discussed in the program workshops to future teaching, learning and research experiences.

Table 1 provides an overview of the collated pilot year data from all 5 badge programs. Over 91% of all participants indicated they feel more prepared and will be able to apply their learnings in future teaching opportunities. There finding support those of Bass (2012), indicating that the development of "real world skills" through experiential learning has a positive and powerful impact on the quality and meaning of learning experiences.

Table 1

Collated Badge Level Evaluation Data

	Strongly Disagree		Disagree		Neutral		Agree		Strongly agree	
	GS	PS	GS	PS	GS	PS	GS	PS	GS	PS
I feel MORE prepared for my current and/or future teaching, learning and research experience due to my participation in the program workshops	n= 0 0%	n= 0 0%	n= 0 0%	n = 1 3%	n-=1 5%	n= 2 6%	n= 7 32%	n= 11 33%	n= 14 64%	n= 19 58%
I WILL BE able to apply the material presented and discussions in the program workshops to my future teaching, learning and research experiences	n= 0 0%	n= 0 0%	n= 0 0%	n = 1 3%	n= 0 0%	n= 3 9%	n= 8 36%	n= 10 30%	n= 14 64%	n= 19 58%

Note: GS= Graduate Students (N=22), PS = Postdoctoral Scholars (N=33)

CONCLUSION

As postsecondary institutions work to meet the evolving needs of our graduate students and postdoctoral scholars, it is critical that universities develop professional learning programs that are research-informed, provide valuable experiential learning opportunities, meet the unique needs of their participants, and are contextually appropriate. When grounded in experiential learning opportunities, teaching development programs such as these certificate programs can strengthen teaching and learning approaches and practices and improve student learning outcomes and experiences, both for program participants and for the undergraduate students they teach. We encourage other institutions to emphasize experiential learning in the design or adaption of their teaching development programs for graduate students and postdoctoral scholars within their local context.

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