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INDIVIDUAL AND INSTITUTIONAL FACTORS AFFECTING THE PROFESSIONAL DEVELOPMENT ACTIVITIES OF CANADIAN MUSEUM EDUCATORS

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CHETT BRADLEY

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The undersigned certify that they have read the thesis entitled

INDIVIDUAL AND INSTITUTIONAL FACTORS AFFECTING THE PROFESSIONAL DEVELOPMENT ACTIVITIES OF CANADIAN MUSEUM EDUCATORS

Submitted by

Chett Bradley

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The thesis examination committee certifies that the thesis and the oral examination is approved

Supervisor:
Dr. Debra Hoven
Athabasca University

Committee Member:
Dr. Shabnam Inanloo Dailoo
Athabasca University

External Examiner:
Dr. Richard Lachapelle
Concordia University

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Dedication

To Gabriel. For believing in me. This is for you.

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Abstract

Museum educators (ME) play a pivotal role in translating an institution's collection into meaningful experiences for visitors. Yet, little is currently known about the most effective ways to support the development and sharing of professional knowledge among ME's.

Informed by the epistemological premises of social cognitive theory and ecological constructivism, this mixed methods study investigated the ways in which perceptions of personal investment contribute to Canadian museum educators' ongoing learning activities. To address this question, 172 museum educators from across Canada responded to an online survey, from which 6 were selected for a follow up telephone interview.

Results revealed distinct participation and cost/benefit perception patterns for each of 11 forms of professional development, with strong preference for peer learning formats. Substantial correlation was uncovered between the availability of employer support and participation in a given activity, with more modest correlations being present regarding perceptions of financial cost, skill development potential, topical interest, and enjoyment of the format. Participant age, experience level, and educational background were found to have negligible impacts on activity selection decisions. Interview findings supported these survey findings and offered further insights into the role of convenience in selection decisions and the ways in which ME's use learning communities to inform their learning pursuits. Synthesis of these findings produced four distinct pictures that illustrate how museum educators' professional networks, personality factors, and perceptions of the convenience and accessibility of learning resources work in concert to influence the ongoing learning habits of Canadian ME's.

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Glossary of Terms

To clearly understand this proposal, the following definitions are offered.

Docent	Any supervised museum volunteer or employee whose primary responsibility is to teach about or interpret the museum's objects through direct contact with visitors, and who does not have decision-making authority over museum education programming.
Ecological Constructivism (EC)	An emerging theory of learning in which learners are seen to exist within dynamic and continually evolving networks of social and material resources which act to mutually influence knowledge construction.
Interaction Equivalency Theorem (IET)	An educational model which proposes that formal learning and teaching can occur as a result of mutually-influencing exchanges of information between and among students and/or teachers and/or course content.
Museum	Any not-for-profit community-oriented institution dedicated to the conservation, research, and promotion of cultural, historical, or natural heritage.
Museum educator	Any museum staff or volunteer leader with decision-making authority over the design or delivery of programming aimed at fostering visitor or community learning.
Professional development	Any activity or experience which serves to maintain, expand, or enhance one's professional expertise, professional practice, or professional self-concept.
Social cognitive theory (SC)	A theory in which behaviour, personal factors, and environmental factors are considered to exist within a mutually influencing triadic relationship.

Chapter I

Introduction

As practitioners and advocates of non-traditional learning, it is important for distance education professionals to model the values of lifelong learning. For many, this means making a concerted effort to balance a range of formal and casual opportunities for helping them to receive and integrate new information into their practice and develop new skills.

Research examining educators' participation in formal and informal professional learning activities has been shown to positively impact teachers' professional self-concept, as well as student outcomes (Borko, 2004; Richter, Kunter, Klusmann, Lüdtke, & Baumert, 2011; Rogers E. , 2014; Schlager & Fusco, 2003). Most studies, however, have focused on educators working within school and higher education settings. As such, study participants may have been benefiting from support structures through their institutions which influenced both the range of opportunities available to them and their decisions to participate. These supports could conceivably range from formal access to funding, to permission to utilize facility resources, to simply working within a community of peers. Since educators working outside of traditional academic settings may or may not have similar supports available to them it is possible that the professional development patterns described by the literature do not accurately reflect the realities of these “community-based” educators.

In Canada today, many professional associations, private corporations, and social institutions count distance education specialists among their staff. These community-based educators are typically charged with the development or oversight of learning-oriented programs for the organization’s staff or public audience. This study focuses on one sub-set of this broader population of community-based distance educator: those employed by museums.

According to the International Council of Museums (n.d.), the term ‘museum’ refers to a broad range of community-oriented institutions dedicated to the conservation, research, and promotion of cultural, historical, or natural heritage. As such, the museum sector includes not only sites that display precious artefacts, but also public gardens, historic properties, national parks, art galleries, science centres, zoos, aquariums, national monuments, and other similarly focused groups. There are roughly 2700 museums in active operation in Canada today (Government of Canada, 2018).

Both museum professionals and educators consider museums to be community-based places of learning (Burnham & Kai-Kee, 2011; Crow & Din, 2009; Dewey, 1938; Falk & Dierking, 1992; Monk, 2013; Salar, Özçınar, Çolak, & Kitis, 2013; Serrell, 1996). Museum based educators must be skilled at designing and delivering educational programming for a variety of audiences, from small children and school groups, to second-language tourists, to local enthusiasts, to other museum professionals (Falk & Dierking, 1992). Moreover, museum educators are expected to be skilled at inciting engaging and meaningful learning experiences not only during face-to-face encounters, such as during guided tours, but also while remaining firmly out of sight (Johnson, Huber, Cutler, Bingmann, & Grove, 2009). Developing manipulative science displays that act as independent learning modules, and wall text that quietly interjects provocative questions about contentious artefacts are two easily recognized examples of the skills and role of the museum educator.

While many museums offer visitors the opportunity to engage with educational staff through guided tours, most visitors choose to explore on their own (Falk & Dierking, 1992). As a result, museums must create opportunities for self-guided visitors to engage with and learn from the museum’s objects and displays in the absence of a live interpreter (Banz Jr, 2009). Moore’s

(1993) theory of Transactional Distance describes distance education as the transmission or exchange of information between instructors and learners separated by physical space or by time. This separation necessitates the adoption of special teaching strategies and techniques that minimize potential discrepancies between the instructor's intentions and learner outcomes. Since self-guided visitors are dislocated in both time and place from the museum's content experts, these museum learning experiences can effectively be considered a form of distance learning. Museum educators must therefore possess specialized distance teaching skills in order to foster such experiences among their visitors.

1.1 Research Problem

Currently, very little is known about how practising museum educators develop the skills necessary for creating effective visitor learning experiences (Castle, 2006; Evans-Palmer, 2013; Grenier, 2005; Reid, 2013). Existing studies on museum educator professional development have tended to be qualitative, often exploring educators' reflections on the activities they have pursued, but have largely avoided addressing the decision to participate itself. An examination of the perceptions and support structures influencing the professional development activities of museum-based educators can provide valuable information about how these educators develop their distance teaching skills, maintain currency in their practice, and choose to embody the values of lifelong learning.

In order for the field of distance education to develop a model of practice that reflects the realities of all distance educators it is important to understand the barriers and facilitators impacting professional development participation among not only traditional educators, but also those who choose to work within the community, such as those working within museum settings.

1.2 Theoretical Perspective

The present study takes an eclectic approach in its conception of theory, drawing on the ideas of both social cognitive theory (SC) and ecological constructivism (EC) to advance an operational model that acknowledges the highly individual nature of ongoing professional learning among museum educators while also enabling the identification of emergent patterns across educators.

SC posits that human behaviour is the result of complex and reciprocal interactions between individuals and their environment (Schunk, 2012). Central to SC are the ideas that human behaviour is mediated by personal motivation and self-regulation, and that learning involves multiple social and cognitive processes related to sense-making and self-concept. The impact of environmental factors on learning and behaviour, such as social support, is also of interest to social cognitive theorists.

The role of environmental factors in learning is also important within EC, an emerging theory that considers learning to be a dynamic process mediated by intra-personal, social, and contextual forces (Hoven & Palalas, 2016). In EC, learners are thought to exist within distributed and continuously evolving networks of social and material resources in which knowledge is developed and exchanged (Jakobsdóttir, McKeown, & Hoven, 2010).

Research related to SC can offer some insights to the role of individual and situational factors on museum educator learning decisions. For example, research on motivation and self-efficacy beliefs can be used to explain why individual museum educators may avoid certain learning activities. But when opportunity, motivation, and expectation of success are all high, it is less helpful for explaining why those events may still be avoided yet similar events may be pursued. EC attempts to address these gaps by describing learning, and decisions leading to

learning, as context-specific at both the interpersonal and the intra-personal level. More specifically, the learner's preferences, emotions, past experiences, and values are proposed to interact with environmental resources to foster and mediate learning. Equally important, EC conceives of the learner and each of the environmental resources (whether human or material) available to him or her as nodes within a networked system and, as such, changes at one node have the potential to significantly impact the system itself. This said, as an emerging theory, the premises of EC are, as yet, largely untested.

Although SC can help us to understand some of the cognitive processes that influence learning, it fails to sufficiently account for the many affective factors that may also mediate engagement with learning opportunities. Further, it can only provide a very broad explanation for the social forces that can influence what, when, and how something is learned. EC includes these considerations within its conceptual framework but does not offer detailed explanations for the individual processes pertinent to social learning and decision-making. Thus, neither theory alone can offer us a robust understanding of the decision processes or participation patterns of museum educators seeking professional betterment. However, since each theory tends to focus its view at a different explanatory level they are not incommensurable. When considered together as complementary perspectives of the cognitive, social, and instrumental aspects of learning, we are able to recognize and account for the various personal and environmental forces that impact the learning process. In particular, the concepts of self-efficacy beliefs, motivational factors, and learner preferences and values each hold importance for developing a rounded understanding of the professional development patterns of museum educators, and each of these will be discussed in detail in Chapter 2, Review of the Literature.

1.2.1 Operational model. Based on the foundations laid by Michael Moore (1989), a small handful of researchers have developed a model to describe the environmental interactions that influence learning within formal educational contexts. Known as Interaction Equivalency Theorem (IET) (Anderson & Garrison, 1998; Miyazoe & Anderson, 2010b), this model places the learners, the teacher, and the instructional content in reflexive and mutually influencing relationships (Figure 1). IET proposes that high quality learning is maintained so long as at least one type of student-oriented interaction is present at a high level (i.e., student-student, student-content, student-teacher). IET further proposes that educational events that feature more than one type of student-oriented interaction at mid to high levels may be perceived as being more enjoyable, but that such designs likely come at a cost of increased effort and/or budget to the student or institution. By extension, these same propositions apply to high quality teaching when focussing on the interactions of the teacher (i.e., teacher-teacher, teacher-content, teacher-student). A detailed discussion of IET and the research examining its constituent theses is included in Chapter 2, Review of the Literature.

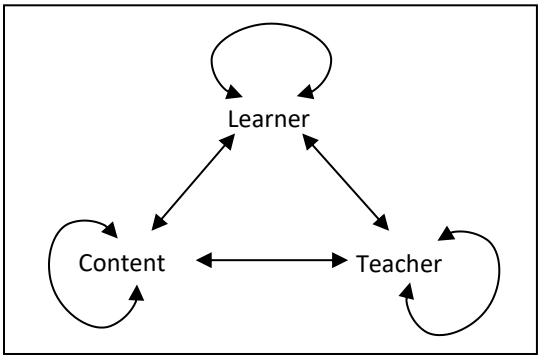

Figure 1. Modes of interaction in distance education from Anderson and Garrison (1998).

Drawing on the ideas of SC and EC, the present study took a mixed-methods approach to investigate museum educators' professional development decision processes through the lens of IET. As applied to this study, the concepts of IET provided an organizing framework for

analysing the personal and situational perceptions and the participation patterns of museum educators in various types of ongoing learning.

1.2.2 Philosophical foundations of mixed-methods research. Social problems are influenced by personal, cultural, and political forces that are not always easily answered through quantitative or qualitative means alone. To address this issue, mixed-methods research designs allow researchers to collect diverse types of data within a single study in order to better address the complexities of social phenomena. Often informed by a pragmatist worldview, mixed-methods research tends to hold the needs of the research problem, rather than absolute philosophies, accountable for determining the most appropriate research method for a given question (Creswell, 2014).

Despite the highly subjective and context-dependent nature of human decision-making, general patterns can often be uncovered which help us to understand the degree to which particular factors are likely to influence outcomes. The mixed-methods approach allowed this study to consider both quantifiable data and experiential information to better understand why Canadian museum educators choose the professional development activities they do.

1.3 Purpose

Taking a pragmatist perspective informed by Anderson's (2003) and Miyazoe and Anderson's (2010b) IET, this study calculated quantitative measures of Canadian museum educators' perceptions of, and participation in, formal and informal professional development activities. It additionally used qualitative text-based analysis to clarify museum educators' personal rationalizations for their participation decisions. Findings from this study shed light on the collective perceptions of specific types of professional development among Canadian

museum educators and builds our understanding of how these teachers tailor and maintain their individual professional learning environments.

1.4 Research Question

The primary question which guided this research project asked: “To what extent and in which ways do perceptions of personal investment serve to contribute to Canadian museum educators' decision to participate in formal and informal professional development activities?”

To sufficiently answer this question, three sub-questions were addressed:

S1: To what degree can perceptions of personal cost and benefit be used to predict museum educators' participation in professional development activities?

S2: To what degree can measures of age, formal education level, and years in practice be used to predict the types of professional development activities museum educators are likely to participate in?

S3: How do museum educators feel their participation in professional development activities contributes to their professional growth as educators?

The research methodology, processes, and tools that were used to address these questions are detailed in Chapter 3, Methodology.

1.5 Significance of the Study

As community-based educators, museum educators encourage learning among a wide variety of visitors and within a range of contexts, often never meeting their audiences face to face. By examining the degree to which personal and environmental factors affect museum educators' decisions to participate in formal and informal professional development activities we can begin to envision how community-based distance educators, in general, might overcome

burdens to developing their specialized skills and maintaining currency in their practice in the absence of traditional academic support structures.

A study which uses the IET model to examine museum educators' professional development decisions offers the distance education and heritage conservation communities a potential bridge for future cross-disciplinary or collaborative theory-based research initiatives related to informal and culturally relevant distance learning. Further, such a study helps to advance our understanding of IET and broadens its research base by focussing on the teacher-related interactions described within IET, as will be discussed in Chapter 3, Methodology.

This study also offers the museum educator community empirical evidence of the factors of importance when advocating institutional support for activities of value for improving museum education practice, and for informing the design of new programs that align to the range of preferences and perceptions of Canadian museum educators toward various forms of ongoing learning.

Finally, the findings from this exploratory study can lend support to the advancement of both EC and SC theories by concurrently examining the influences of situational and personal factors on decisions to participate in various forms of voluntary professional learning, and how these may change over the course of one’s career.

1.6 Definition of Terms

When discussing museum education, it is important to distinguish between two related, but distinct, education team positions.

Individuals charged with leading visitors through the museum are variously referred to as docents, gallery teachers, explainers, interpreters, or guides. While some larger institutions may retain a limited number of these positions on staff, typically these are volunteer roles and often

demand a significant time commitment. According to McCoy, the typical docent in America is an upper middle-class, 40- to 50-year-old female who attended university or college but who is currently unemployed (Grenier, 2005). Docent positions are typically practiced under the supervision of a trained museum professional who may or may not be a volunteer themselves. While individuals in these positions will often tailor their tours to suit their audience, they are not generally responsible for developing new educational programming.

By contrast, educational leader positions within museums are typically filled by individuals with formal training in museum studies or a content expertise related discipline, such as archaeology (Ebitz, 2005). These individuals, often referred to as museum teachers or museum educators, are typically responsible for leading the docent teams and designing their training, working collaboratively with curatorial staff to develop new resources, and helping the museum to set and achieve its strategic priorities (Bailey, 2006; O'Neill Schmitt, 2014). While these are often paid positions, due to museums' not-for-profit status, smaller institutions may or may not choose to employ these educators as staff. Museum educators offering their services in a volunteer capacity is not unheard of.

It is important to note that the terms museum educator and museum teacher are not reserved exclusively to educational leaders. Regularly within the literature these terms have been used to refer to docent-type positions. As well, role overlap is not uncommon, with both education leaders and docents often directly engaging with visitors. Thus, it is not always immediately clear which museum role a given study is describing when these terms are employed. Wherever possible within this thesis, distinction is made by referring to supervised volunteer teachers as “docents” and formal education leaders as “museum educators”.

1.6.1 Usage of the term perception. Throughout this thesis, the term perception and its variants (e.g., perceived) are understood to be "a belief or opinion, often held by many people and based on how things seem." (Cambridge University Press, 2016). Importantly, this definition emphasizes the personal point of view of the observer, rather than absolute attributes or qualities of the phenomenon being perceived. Given that the focus of this research study is to examine how personal interest and pre-conceptions of resource requirements influence museum educator uptake in various types of learning opportunities, as opposed to the actual resource demands of a specific educational event, this definition and usage of the term is felt to be warranted.

1.7 Summary

As developers of both in-person and self-guided learning opportunities, museum educators can provide the distance education community with unique insights into how distance teaching is both learned and practiced outside of traditional academic settings today. Previous studies on the professional development pursuits of museum educators have offered some indication of the ongoing learning activities that museum educators pursue. However, without also acknowledging the barriers and facilitators that influence participation decisions it is possible that current practices are being silently swayed by forces that may limit the advancement and application of best practice for distance teaching and learning within non-traditional settings.

Examining museum educators' professional development decisions through the dual lens of SC and EC acknowledges that professional development pursuits occur within a larger sociocultural network of learning opportunities. Adopting a mixed methods research approach to investigating museum educators' participation decisions helps us to clarify the availability and importance placed on environmental supports, and the personal investment perceptions that

shape the pursuit of professional excellence among museum educators in Canada today. To this end, the remainder of this research report will proceed as follows:

Chapter 2, Review of the Literature, will explore the literature supporting a definition of museum learning as a distinct form of educational practice and how museum educators today learn their craft. The evolving conceptualization of professional development as a lifelong learning activity will also be explored. The essential tenets of SC and EC as they relate to a research study on teacher professional development is provided. Finally, an in-depth examination of the literature related to IET and the potential application of this model as a mapping tool for understanding museum educator professional development activities will be described.

Chapter 3, Methodology, will outline the convergent mixed methods design adopted for collecting and analysing the data related to the professional development decisions of museum educators. A summary of the research considerations and requirements for undertaking a project of this scope and type is also included.

Chapter 4, Quantitative Findings, will describe the characteristics of the collected sample, and detail the individual findings of the quantitative components of the study. Summary tables for the performed correlational analyses are included. Notable correlations are highlighted.

Chapter 5, Qualitative Findings, will describe the findings of the qualitative component of the study. Summaries of the interview participants and narrative analysis process employed are included. Notable textual themes are highlighted.

Chapter 6, Comparative Analysis and Discussion, will highlight areas of convergence and divergence between the two data sets, and describe how these elements combine to create a holistic picture of the professional development habits of Canadian museum educators. The study's research questions will also be revisited in light of these findings.

Chapter 7, Implications and Areas of Future Research, will discuss the importance of the study findings on the research and practice of museum education, review the experience of using IET as a conceptual model for understanding lifelong learning, and describe potential areas and lines of research that this study opens up.

Chapter II

Review of the Literature

Museums have undergone radical changes in their focus and approaches to community engagement and learning over the past 30 years (Johnson, Huber, Cutler, Bingmann, & Grove, 2009). Once seen as decorous and reserved store-houses of relics, museums have transformed into places of community building, public entertainment, and learning in recent years. Influenced in part by the social and critical philosophies that many museums have found to resonate with their own missions, museums today are widely known to engage with visitors and their communities using dialogic, participatory, and inclusive approaches to programming (Bedford, 2014; Burnham & Kai-Kee, 2011; Reid, 2013). This shift has given the museum sector new vitality and renewed public interest in museum experiences.

In this chapter, I will describe what learning means within the modern museum context, and the main forces that have helped to shape what museum education practice looks like today. I will begin by providing an overview of what distinguishes museum learning from more formal approaches to education, then explore the main literature describing how museum educators learn their craft and develop themselves as professionals. Finally, I will briefly review the main concepts within social cognitive theory (SC) and ecological constructivism (EC) that are of special relevance to a research project that seeks to understand museum educators' professional development patterns. I will make a specific case for framing such a research project around the concepts inherent to the Interaction Equivalency Theorem (IET).

2.1 Learning in Museums

The types of learning that result from museum experiences are widely recognized as being distinct from those that take place within academic settings. Schugurensky (2000)

characterizes formal (i.e., school) education as deeply hierarchical, with mandatory and institutionally sanctioned curricula, discrete subject areas, learner assessment mechanisms, and offering recognized status for graduates. Museum learning, by contrast, is characterized by high degrees of informality and self-direction on the part of the learner, and may be liminal – the visitor being only partly or intermittently aware that they are learning (Banz Jr, 2009; Falk & Dierking, 1992; Taylor, 2010). Learning from museum experiences is situated, and often focusses on affective (Ebitz, 2005), transformational (Taylor, 2010), or community-oriented (Falk & Dierking, 1992) outcomes, tending to help visitors build subtle awareness of systemic or cross-disciplinary connections between objects or concepts. Furthermore, visitors are looking for an entertaining way to learn, and expect to receive value for their money (Ebitz, 2005; Hanquinet & Savage, 2012). In its broadest sense, museum learning is understood to be "any activity pursued with a view of facilitating knowledge or experiences for public audiences" (Johnson, Huber, Cutler, Bingmann, & Grove, 2009, p. 8).

As a result of museums' particular orientation toward learning, museum educators and docents are required to develop unique skills, strategies, and teaching techniques that may be less familiar to school-based educators (Ebitz, 2005; Evans-Palmer, 2013; Garcia, 2012; Heimlich & Horr, 2010; Taylor, 2010; Tran L. U., 2007; Tran & King, 2007).

2.2 Teaching in Museums

As briefly described in Chapter 1, museum education teams often include at least two positional levels: the museum educator and the docent. Although museum educators and docents are formally considered to be distinct positions (Castle, 2001), boundaries between their specific activities can sometimes blur in practice. For this reason, this section considers the literature

related to both museum educators and docents with regard to teaching and learning to teach within museums.

2.2.1 Museum educator and docent roles. Museum educators are often responsible for overseeing a range of programs and activities from the highly informal (such as crafting visitor guides and newsletters, or assisting with exhibit label text) to the semi-formal (designing community workshops, leading gallery tours) to the highly academic and formal (program evaluation and research, organizing conferences and symposia, designing docent training programs) (Castle, 2001; Bailey, 2006; Johnson, Huber, Cutler, Bingmann, & Grove, 2009; O'Neill Schmitt, 2014). As well, many museum educators today are expanding their focus beyond the traditional brick-and-mortar museum space, and are beginning to develop online (Bontempi & Smith Nash, 2012; Limongelli, Sciarrone, Temperini, & Vaste, 2012; Salar, Özçınar, Çolak, & Kitis, 2013), mobile (Brouard, Hernanz, & Etxeberria, 2009; Ross & Arbach, 2007), and social media based (Crow & Din, 2009; Russo & Watkins, 2008) programming.

Docents, by contrast, work intimately with individuals and groups to create an engaging and meaningful exploration of the museum's collection. To do this effectively, docents must be skilled at quickly developing an understanding of the individual visitors, their interests, and their expectations, in order to tailor their tours accordingly. Historically, didactic approaches to teaching visitors about the museum's collection were considered *de facto* (Burnham & Kai-Kee, 2011). In this approach, docents escort visitors through a pre-selected series of museum objects, providing mini-lectures created by content experts on the historically, culturally, or ecologically important details of each object. While enthusiasm for the didactic approach has waned in recent decades, the didactic approach is still often employed (DePrizio, 2016; Robinson, 2016; Tran L. U., 2007). Beginning around the 1980's, more participatory and personal-interpretive approaches

began to emerge (Burnham & Kai-Kee; Crew, 2007). A full discussion of these various approaches is beyond the scope of this paper. However, briefly, within these approaches docents will often adopt a facilitator role, guiding visitors through highly personal explorations and interpretations of the works through questioning and discussion. These explorations may or may not be supplemented with standard contextual details of the object. These distinct orientations to teaching, the didactic and the participatory-interpretive, require docents to possess very different teaching skills—the former tending to require detailed knowledge of a large number of objects in the museum, and the latter requiring facility in discursive teaching methods, visual thinking, and group management.

It should be noted that while the above describes gallery teaching as primarily a docent responsibility, many museum educators also often lead visitor tours. Further, museum educators are responsible for training the docent team on one or more of these teaching approaches. Thus, museum educators are expected to be intimately familiar with various gallery teaching strategies (Ebitz, 2005).

2.2.2 Professional context. For her doctoral dissertation, Grenier (2005) examined the ways in which individuals find their way into docent positions within American museums and how their expertise in museum teaching practice develops. Using an “interpretive qualitative approach” (p. 71), Grenier found that docents hail from a wide variety of academic or fine art disciplines. This trend was confirmed in Castle's (2006) own study of how Canadian docents learned to teach. Castle's qualitative study further revealed that while some docents do have prior experience as classroom teachers, the majority do not begin their jobs as docents having any formal knowledge of teaching practice or learning theory. Rather, they will often find themselves taking on teaching positions due to their expertise in the museum's content area. Both Bamberger

and Tal (2007) and Bailey (2006) found very similar trends in their own qualitative studies of Israeli science museum and American natural history museum educators, respectively. Bailey further noted that American museum educator job descriptions and skill requirements can vary widely from institution to institution, and that due to their community-based nature they are not subject to the same regulatory requirements in terms of prerequisite credentials or experience as school-based educators.

The value of formal teaching credentials also appears to be limited among museum employers themselves: Ebitz's (2005) survey of job postings for museum educators across the United States found that only 25% of postings sought candidates with formal background in museum education, and in many instances prior on-the-job experience or formal school teaching experience were considered to be adequate substitutes. Whether these trends will continue over the coming years remains to be seen. As Garcia (2012) notes, the increasing inclusion of modules on museum pedagogy within academic museum programs in recent years is beginning to shift the professional landscape as graduates of these programs enter the workforce. The nature of these preparatory programs will be discussed in greater detail in the following section.

While formal opportunities for museum educators to learn about pedagogy may be slowly on the rise in the United States, an opposite trend may be occurring in the United Kingdom. Museum educator roles within British museums have more typically been filled by former school teachers. Castle (2016) suggests that this may be due to the high attention British museums have historically placed on school groups as a sustaining revenue source, and the resulting demand for educational programs that fit within the British school curriculum. British museums seeking more diverse revenue sources, however, have begun looking to the North American museum model, which places greater emphasis on providing special exhibitions that attract wide

audiences for revenue generation. As the need to attract more diverse audiences has increased in British museums, so has the pressure for diversity within the curatorial and education teams.

Despite the limited formal training in teaching or museum learning that many current practitioners in North America have, museum educators are expected to be professional advocates of education, supporting both the learning needs of their visitors as well as fostering the professional development of the museum community in general through the creation, dissemination, and translation of theory and practice-based research on museum learning (American Association of Museums Standing Professional Committee on Education, 2006).

Museum educators are responsible for a unique and significant portion of the overall museum experience. Yet, as Reid (2013) notes, their voices are often muffled within their institutions and "their support systems are often far too thin for them to be able to fully achieve their goals and fulfill the demands placed on them by their institutions" (p. 228). Franco (1992) recalls that in prior decades "[museum] educators were not expected to have expertise, but to communicate it," and that "operating in an institutional culture that valued expertise above communication, education departments…were relegated to the basements of most institutions" (p. 10). In recalling his experiences at the National Gallery of Canada during the 1970's, Lord (2007) describes the museum educators being treated like "handmaidens of the curatorial team" (p.79). Tensions between the education and curatorial teams still characterize the staff culture of some museums (Johnson, Huber, Cutler, Bingmann, & Grove, 2009). Given such a climate, it is not surprising that burnout and career attrition is high among museum educators (Cooper, 2007; Lemelin, 2002).

While stories like Lord's are not unheard of even to this day, advances have been made. Grassroots efforts to have museum education recognized as a distinct profession that straddles

both education and museum practice began as early as the 1970's and advocacy for greater levels of professionalization continues today (Ebitz, 2005; Garcia, 2012). Supporting the assertion that museum educators practice at a professional level, Bailey (2003) found many museum educators to exhibit high internal motivation when it comes to self-improvement, dedicating significant personal energy to their ongoing professional development. Moreover, many museum educators were found to independently seek out learning opportunities relevant to the museum's content area and museum teaching practice, even if institutional support opportunities were not available.

2.2.3 Educational training programs. Formative programs focussing specifically on preparing individuals to become museum educators are not common but do exist in the United States and internationally (Ebitz, 2005). In Canada, the Master of Museum Education program at the University of British Columbia appears to be the only university-based program to currently offer a specific credential in museum education, though development of a similar credential is currently being investigated by Concordia University (Lachapelle, 2017). Several other Canadian university, college, and community-based museum studies programs include elective or mandatory modules related to museum education within their curricula. Of the 47 museum-related programs in Canada in 2016, only 12 included modules that address approaches to museum education in some capacity (Lapointe, 2016). Some of these programs address education within the context of either public programming broadly or interpretation specifically, and while both these subject areas can help young museum professionals to build contextual understanding of a museum's educational programming decisions, they are insufficient on their own to prepare aspiring educators to develop pedagogically sound programming once on the job. Further, as Castle (2001) warns, interpretation as a strategy for facilitating visitor understanding of a museum object is not applicable to all museum types and should not be confused with a

broader study of museum education which includes curriculum development, learning theory, teaching strategies, and program evaluation. Of the programs in Canada which do include modules on museum education, the majority are offered through universities and several are at the graduate level. Furthermore, Lapointe (2016) found that the number of courses that address learning within museum contexts been on the rise since 1998, which suggests that despite the apparent trends in hiring practices described by Ebitz (2005), museum education is becoming recognized as a specialized area of museum practice that requires a certain level of knowledge, scholarly aptitude, or professionalism. This said, Castle (2016) describes a marked lack of collaboration or connections at Canadian universities between the schools of Education and Museum Studies. As such, while some programs do feature modules on museum education, it is not clear to what extent their content reflects current educational thinking.

Whether the current paucity of certification programs specifically in museum education reflects an institutions-level delay in developing programs that address current needs, a resistance within the sector to recognize museum education as a wholly distinct profession, or a concerted attempt to promote museum education as a competency of all museum professionals is unclear.

2.2.3.1 Onsite and on-the-job learning. Formal education programs can provide an efficient route to entering a profession, but they are not always the only route. In fact, as Hagar (2001) notes, formal programs are often insufficient on their own for producing long-term proficient practitioners. Practical experience and exposure to experienced professionals within real-world work settings are also important for developing professional competence.

In the case of docents, training programs are almost exclusively held onsite and appear to be—often to an overwhelming degree—limited to museum-specific content knowledge (Castle,

2006; Grenier, 2009). Bailey (2003) found that onsite learning for museum educators also included becoming conversant and staying up to date on the museum's content areas. However, she also found that their approaches tended to be more emergent, experimental, and self-directed than those of docents. Learning how to meet the needs of different audiences, including the language and expectations of the formal education sector in order to better collaborate and design appropriate school programs, was also a major area of learning for younger museum educators. Learning to teach through trial-and-error was a common theme uncovered in Bailey's study. Beyond this, she found onsite museum educator learning to be often quite individual and highly dependent on the nature of the institution and the individual's particular job description. As such, developing relationships with colleagues across the museum was found to be a significant component of museum educator onsite learning. Museum educators often called on these relationships for formal or informal mentorship or for expert opinions.

Depending on the institution, additional opportunities may also be available for self-motivated novices to begin developing the practical teaching skills necessary to succeed in their role (Grenier, 2005). These opportunities may include organized group discussions with other educators and docents (Grenier, 2005, p. 142), expert-led workshops on new collections items (p. 107), or opportunities to shadow more experienced museum educators (p. 112). Despite these opportunities, in the case of docents, Castle found that those who were not previously familiar with a particular content area were unable to move their new content knowledge beyond a declarative level for quite some time. Docents who were unfamiliar with a given interpretive technique or teaching strategy were also unable to recognize those behaviours in the more expert museum educators they shadowed. Thus, much of the potential learning afforded by these informal activities went unrealized. While museum educators were not included in Castle's

study, it is reasonable to postulate that they, too, could experience similar hurdles to developing their professional practice, particularly if they do not possess a threshold level of pedagogy knowledge related to what they are observing, or if the training program does not include additional strategies to help encourage recognition and transfer, such as debriefing and guided practice (Brandsford, Brown, & Cocking, 2000).

2.2.3.2 Other learning opportunities. Beyond entry-level and on-the-job training, it appears that some museum educators have access to ongoing professional development opportunities through their institutions. These will often cover specific museum content areas, as well as basic pedagogical topics, though the availability of these opportunities is highly dependent on the institution (Bailey, 2006). For example, Evans-Palmer (2013) found that professional development opportunities related to teaching efficacy in art interpretation was rarely offered in the United States.

Several opportunities for ongoing docent and museum educator learning outside of the museum's walls are also available. Museum employers may or may not support participation in these opportunities through financial assistance or other accommodations. In 2017, Canadian museums invested, on average, 0.2% of their annual expenditures on staff and volunteer training and development (Government of Canada, 2018). Examples of development opportunities include formalized courses and programs, such as the Teaching Institute in Museum Education offered by the School of the Art Institute of Chicago, as well as more casual opportunities for ongoing learning through regional and national associations (e.g., Canadian Art Gallery Educators Association, Association of Zoo and Aquarium Docents and Volunteers), conferences (e.g., Special Interest Group on Education Mediation in Museums Symposium, National Docent

Symposium) and networking/knowledge-sharing groups (e.g., Museum-Ed.org, Museum Education Roundtable).

Cooper-Fleck's (2001) doctoral study of 32 paleontology museum professionals in the American south-west found an overwhelming preference for informal forms of training and ongoing learning. Participants in Grenier's (2009) study also described the informal learning opportunities they had access to as having greater value to their practice than the formal training programs. Grenier categorized participants' informal learning activities into two types: learning from others, including such activities as expert observation, shadowing, modeling, and peer discussions; and self-directed learning, including activities such as directed reading, attending lectures, and reflective practice. Similarly, for her doctoral dissertation Reid (2013) documented the life histories of five museum educators and debriefed each participant on their experiences within the research project. As part of the study, participants were asked to contemplate their professional history and reflect on the evolution of their professional practice. This opportunity to engage in professional self-reflection was cited by nearly every participant as being a significant and unique opportunity for professional identity development and professional learning. While some confessed that they were previously unfamiliar with self-reflection as a professional development technique, others pointed to their workloads as a barrier to engage in such activities independently.

O'Neill Schmitt's (2014) mixed methods doctoral research examined how the communities of practice of art museum educators' and curators influenced their professional personae. She found that both professions tended to enact the values of their respective communities of practice. The teacher persona of art museum educators tends to be “people [persons]” (p. 79) and, as a result, making connections with visitors' personal lives tends to be a

strong element in their teaching, closely matching the values of their community of practice. Given museum educators' preferences for informal learning, and being “people persons”, it is possible that museum educators may be more inclined than other museum professionals to take advantage of the casual and social learning opportunities afforded by membership in professional associations or other professional networking groups.

2.2.4 Summary and implications for this study. The literature to date provides a glimpse into museum educators’ professional identity and ongoing learning habits, and there is consensus among museum educators that the profession would benefit from a more concerted and well-rounded approach to training and professional development (Castle, 2006). Indeed, the literature would seem to suggest that learning to teach within museums is often a matter of individual circumstance.

This study seeks to clarify the degree to which personal and environmental factors influence the professional development activities of Canadian museum educators. As such, the preceding discussion of the professional and educational backgrounds, organizational contexts, and learning preferences of docents and museum educators helps us to identify the dominant factors on which to ground such an examination. Building a common understanding of what is implied by the term “professional development” and its role in the professional practice of museum education will be the focus of the next section.

2.3 Professional Development

In order to address Castle's call for more strategic approaches to professional development, it is important to recognize what is meant by the term today, and what this activity implies for a profession. In this section, I will describe professional development as an evolving concept, and offer a distillation of the key ideas shared by the various conceptualizations that

have been proposed to date. The idea of lifelong learning as a broader concept that encompasses professional development, and its relationship to professional practice will also be explored.

2.3.1 Toward a definition of professional development. Professional development can be broadly described as being the pursuit of various learning opportunities in order to maintain or enhance one's practice. Several more specific definitions have been proposed, though it seems that no single definition has yet been universally accepted.

Madden and Mitchell (1993), in their definition, suggest that professional development is a set of ongoing and deliberate activities, including the formulation of a plan for learning that is informed by the needs of the professional, their employer, the profession, and society. Fullan (1995) adds to this by acknowledging the validity of both formal and informal activities in pursuing professional self-improvement, while hinting that professional development is both the reason for and the result of dynamic changes within the environment. Day, as quoted by Broad and Evans (2006), goes even further by acknowledging that incidental learning can also be considered professional development, and proposes that professional development includes both individual and social activities. Finally, Richter, Kunter, Klusmann, Lüdke and Baumert (2011) specifies that professional development is not simply constrained to professional knowledge and skill development but rather that formal and informal activities that deepen or extend teachers' beliefs, motivations, and self-regulatory skills are also valid components of professional development.

The above conceptualizations, offered over the course of nearly two decades, not only help us to refine our idea of what it is to learn as a professional, they also seem to evince a philosophical shift with regard to the professional learning impulse over that time period. This shift is perhaps most clear when we compare the idea of professional development to a closely-

related concept, continuing professional education (CPE). CPE places value on advancing one's practice through traditional and formal learning, such as courses, workshops, and conferences, to the exclusion of formats for which outcomes cannot be fully anticipated or measured, such as on-the-job and self-directed learning (Erhaut, 1994). The benefit of CPE is that it allows individuals and professional oversight bodies to readily plan, measure, and document a professional's knowledge and skill development over time. However, by restricting itself to formats in which many of the learning decisions are made by a third-party, CPE promotes an orientation which favours external regulation over individual autonomy. By acknowledging the contributions of work-based, informal, social-affective, and incidental learning to a professional's ongoing development, Fulan (1995) and Day (Broad & Evans, 2006) effectively position the locus of control at the learner for assessing and managing their own growth as professionals. Richter et al. (2011) maintains this learner-centric view, but in proposing professional development to be a holistic endeavour encompassing the social, cognitive, and affective facets of professional life they begin to evolve the concept of professional development away from describing a particular set of activities to describing a sort of "learning orientation" to one's professional practice.

Revisiting the concept of professional development from this learning orientation perspective, several additional characteristics can be inferred from the above studies:

1. It is a lifelong process, not an event or even a series of events.
2. It is intentional, though not always pre-meditated.
3. It is constructive—taking different forms as needed, all aimed toward expanding the depth or scope of one's expertise and professional self-concept.
4. It is highly individual, most often reflecting self-identified needs and preferences.

5. It is context-dependent, seeking to minimize perceived gaps between the individual's skills and the demands of their environment.

Referencing the contextual nature of teacher professional development, Borko (2004) describes professional development as a spiral process of increasing teaching efficacy by way of participating in the practice of teaching. Thus, it would be reasonable to expect that as an individual's experience in teaching increases, their professional development participation patterns will also evolve. In fact, Richter, et al. (2011) confirmed this tendency in their study of 1900 German schoolteachers. They found that formal learning was most popular among mid-career teachers, while informal learning participation exhibited quite different trends: novice teachers tended toward high involvement in collaborative activities and low uptake in professional reading, while the reverse was true for late-career teachers. These findings are, upon reflection, not wholly surprising. Knowles (Knowles, Holton, & Swanson, 2005), Tough (1979), and Grow (1991) have all described the tendency for individuals to experience declining need for formal learning structures and increasing interest in self-directed or informally structured learning opportunities as their familiarity with a topic develops. This is important for the proposed study, as it implies that both the motivations for learning and the preferences for specific learning formats are likely to change as museum educators progress through their careers.

Although a universally acceptable definition of professional development has yet to be proposed, from the above discussion we might conceive it to be at the very least a highly personalized and dynamic matrix of learning experiences through which individuals continually refine their knowledge or practice of their profession. The importance of informal learning activities within this matrix is the focus of the following section.

2.3.2 Informal and lifelong learning as a professional habit. Schuguresnky (2000) defines informal learning as any learning that takes place outside of any formalized structures, whether they be formal classroom settings or traditional instructional constructs such as curriculum or explicit learning objectives. It is also important to note that informal learning, as the term itself denotes, places emphasis on the purpose (learning) rather than on the structure (education) of the endeavour. According to Schugurensky, the variety of experiences which comprise informal learning can be categorized and envisioned within a two-dimensional frame according to the learner's level of intentionality and conscious action (Figure 2).

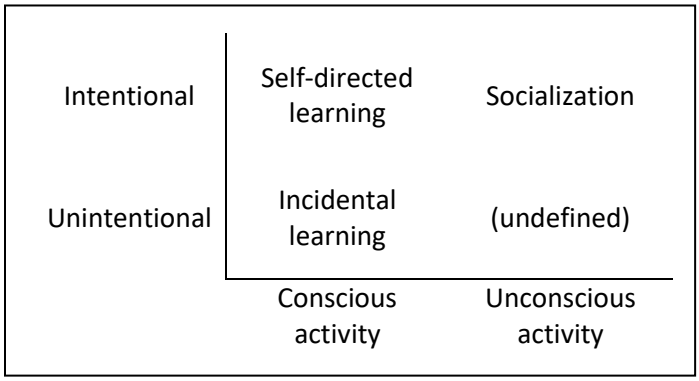

Figure 2. Classification of informal learning from Schuguresnky (2000).

Hagar (2001), by contrast, focusses on the locus of control as one of the defining features of informal learning, alleging that in formal situations the educator determines what is to be learned and when. Informal learning, however, is such that the learner is in control of the what, where, and when of the learning project.

Given their common emphases on self-direction and fluidity of format based on the needs of the situation, informal learning would seem to be an appropriate strategy for supporting the professional development of museum educators. However, simply handing learners the reins is not sufficient for ensuring success. As Jakobsdottir, McKeown and Hoven (2010) comment,

"lifelong learning requires the learner to develop skills in identifying their own learning needs, sourcing appropriate learning opportunities and applying that learning" (p. 110). Recalling Castle's finding that museum educators who had insufficient foundational knowledge were unable to benefit from much of the potential learning offered by expert observation and shadowing, it is clear that we should not assume that all museum educators necessarily have these foundational skills. Including adult education theory and technique, as well as metacognitive skill development strategies within education and ongoing learning programs could help museum educators to not only better meet the needs of their audiences, but also facilitate individual and collective professional advancement (McCray, 2016).

2.3.3 Summary and implications for this study. Patricia Cross (1981) remarked nearly forty years ago that lifelong learning is neither a privilege nor a right, "it is simply a necessity for anyone who must live with the escalating pace of change, whether in the workplace, within the community, or at home" (p. xxi). Understanding how and why professionals learn and the variety of ways that learning can be pursued is central to the success of any effort to foster learning throughout one's life or career. In viewing professional development as a learning orientation to one's practice, rather than as a series of activities, it becomes clear that "learning to practice" a profession is not extractable from practising the profession itself. Thus, ongoing professional learning must be considered broadly, inclusive of all types of further learning, and as a lifelong activity.

This study recognizes that professional learning is a highly personal pursuit that can take many forms throughout one's career. Thus, it investigates a range of formal, informal, and social opportunities for learning that Canadian museum educators might choose to pursue. It also documents narratives related to their participation decisions in order to gain insight on why their

personal learning environments look the way they do. Such a study is predicated on a number of philosophical and theoretical assumptions, which will be the focus of the following section.

2.4 Social Theories of Learning

As we saw in the previous section, professional development is an embedded process of constantly bridging one's existing interpersonal and job-related skills and knowledge with those that are required by an ever-changing environment. To properly understand the professional development patterns of Canadian museum educators, then, we must also recognize that this learning process is not a closed system occurring exclusively within the mind of the professional. It is a process that actively interacts with its larger sociocultural environment.

In this section, I will outline the various theoretical points of view that ground this study of Canadian museum educator professional development. I will begin by describing human learning within the context of social cognitive theory, giving particular attention to the ideas of motivation, self-efficacy, and self-regulation, and to how personal and social factors contribute to learning. The interactive role of affective and environmental factors on learning will then be explored from the point of view of ecological constructivism, an emerging theory which considers learning to be a dynamic and multi-directional process of co-construction. This will lead to a discussion of how these environmental interactions can be studied using a model known as Interaction Equivalency Theorem (IET). The model's evolution and research base will be described, and a proposal presented for how it might be used in mapping the range of resources and activities that museum educators draw on in their pursuit of professional development.

2.4.1 Social cognitive theory. Social cognitive theory (SC) posits that human behaviour is the result of complex and reciprocal interactions between individuals and their environment (Schunk, 2012). Among the key ideas advanced by research into SC are the roles of self-efficacy

beliefs, self-regulation, motivation for learning and behaviour, and the nature of social learning. According to SC, learning is not a passive activity, but one in which the student is engaged in multiple internal and social, sometimes competing, processes.

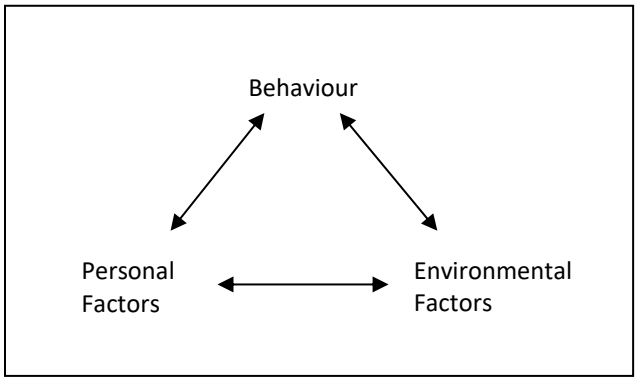

Figure 3. Triadic model of social behaviour from Schunk (2012).

By acknowledging the presence of internal processes, SC enables researchers and education practitioners to address the personal, emotional, cultural, and social cues that moderate learning and its potential expression as behaviour. These ideas led Albert Bandura to develop the concept of “perceived self-efficacy”, the belief in one's ability to plan and carry out an activity. Several studies have confirmed that self-efficacy beliefs influence individuals’ learning in several ways, including task selection, perseverance, effort expenditure, and skill acquisition (Schunk, 2012). Individuals with positive self-efficacy beliefs are more likely to select and follow through on novel or challenging learning experiences, and apply those skills to actual practice (Bandura, 1991). Moreover, self-efficacy beliefs are not fixed, but can change through the accumulation of experiences and interactions with others (Bandura, 1993). An individual's perceived self-efficacy will also vary depending on the task at hand and their familiarity with the subject area.

Although little has been documented regarding the teaching self-efficacy beliefs of museum educators, we do know that many of them have limited prior teaching experience or formal exposure to educational theory. This knowledge gap has the potential to result in negative self-efficacy beliefs, which might limit their willingness to attempt new teaching approaches or pursue novel professional development activities. In her pre-post study of American art gallery educators' self-efficacy beliefs, Evans-Palmer (2013) found this to be true. After learning a new teaching-learning technique, participants were asked to engage in a group practice activity. Although she found several participants to be initially sceptical of the technique and resistant to participate, she was able to use to discussion and enquiry techniques to increase their confidence and gain their trust. Their eventual participation in the activity both positively impacted their ability to perform the activity and improved their feelings toward the activity itself.

Related to self-efficacy, Zimmerman's (1990) work clarified the concept of "self-regulation", which he conceived as being a cyclical three-phase process of preparing for, performing, and finally reflecting on experiences. For individuals to enact self-regulation in learning, both autonomy and the availability of choices are implied. When environmental factors impact an individual's autonomy or the choices available to them, the potential benefits of self-guided learning are likewise impacted (Schunk, 2012). For example, a museum educator who feels constrained by organizational policies or personal resources may alter their professional development habits in ways that do not align with their learning preferences or natural tendencies. If the educator does not perceive alternative equivalent opportunities to exist within the imposed constraints, their pursuit of professional development may be hampered. Furthermore, given that perception is based within individual perspective, two individuals may

interpret opportunities available within the environment differently. This idea is central to the theory of ecological constructivism, which is the focus of the next section.

It is largely through the concepts of self-efficacy and self-regulation that SC acknowledges and explains the role of motivation within learning. While these concepts do offer some hints as to why someone may or may not choose to act on a learning opportunity, on their own they risk reducing the motivation impulse to an algorithm exclusively entailing cognitive processes. Although an in-depth discussion of the rich literature base related to motivation is beyond the scope of this project, some of the social cognitive work that has attempted to account for both the affective and cognitive aspects of the motivation to learn does deserve brief attention given the self-directed nature of museum educator professional development.

John Atkinson (1957) was among the first to recognize the role of personal values in motivation and learning. Similar to Bandura's (1993) concept of self-efficacy, Atkinson's "expectancy-value theory of achievement motivation" emphasises that an individual's expectation of success has a great deal to do with his or her behaviour. However, unlike Bandura, Atkinson also includes personality and the value that the individual places on the successful outcome within the equation. Atkinson's expectancy-value theory is, essentially, an approach-avoid model which balances the incentive to succeed with the consequences of failure in assessing an individual's level of achievement motivation. By incorporating both "risk of failure" and "tendency to avoid failure" elements in his equation, Atkinson subtly recognizes that both dispositional and cognitive factors are relevant to motivation.

Taking a slightly more humanist stance, Carl Rogers (Rogers & Freiberg, 1994) describes motivation in terms of an "actualizing tendency", an innate drive for individuals to grow and maintain autonomous control of their actions and lives. To Rogers, meaningful learning is one

which has relevance to the whole person, including their physical, mental, and emotional aspects. Dale Schunk (Schunk, 1995; Schunk, Pintrich, & Meece, 2008) takes a similar view in his motivated learning model (see Table 1). It is worth noting that within the model proposed by Schunk, personal values, affects, and perceived needs are most prominent during the preparing-to-learn and review-of-learning stages. This seems to suggest that once a project has been started personal traits have less to do with outcomes. This may or may not be true in practice, but would appear to echo the bias toward cognitive learning and the typically prescriptive format of conventional school-based learning.

While Atkinson (1957), Rogers (1994), and Schunk (Schunk, 1995; Schunk, Pintrich, & Meece, 2008) all offer thought-provoking points of view on the motivational aspects of learning, it must be noted that their models largely express motivation within the context of formalized situations or for learning opportunities that are readily available to the learner. They do not sufficiently explain behaviour patterns for informal learning opportunities for which other situational factors might moderate or even supersede high internal levels of motivation, such as available finances, time, or institutional barriers. As such, while they provide theoretical support for the inclusion of personal dimensions in examining decisions to learn, their potential as operational models for analysing the professional development decision-making processes of museum educators is limited.

Another important consideration within SC is the role of social interactions. Unlike approaches based on sociocultural theory, which contends that *all* learning is ultimately socially constructed through language and dialogue, SC approaches take an instrumentalist stance on social learning. More specifically, Bandura (1986) proposed that “by observing others, people form a cognitive representation that initiates subsequent responses and serves as a standard for

Table 1

Model of Motivated Learning, from Schunk (2012).

Pre-task	During Task	Post-task
Goals	Instructional variables	Attributions
Expectations	Teacher	Goals
Self-efficacy	Feedback	Expectations
Outcome	Materials	Affects
Values	Equipment	Values
Affects	Contextual variables	Needs
Needs	Peers	Social support
Social support	Environment	
	Personal variables	
	Knowledge construction	
	Skill acquisition	
	Self-regulation	
	Choice of activities	
	Effort	
	Persistence	

evaluating the correctness of responses (Schunk, 2012, p. 132). As such, SC recognizes that learning can be accomplished by either directly engaging in activities and experiencing their consequences (enactive learning) or by indirectly experiencing these through others (vicarious learning). By observing teacher or peer models performing an activity, individuals begin to develop preliminary cognitive models for behaviours that they can then either replicate or avoid

replicating depending on positive or negative consequences. When latent knowledge gained through observation becomes activated through imitation, a process of positive reinforcement begins as continued practice and action refinements lead toward correct behaviour.

Given the importance of observation within learning, it is unsurprising that much research has focussed on describing and measuring the efficacy of modelling—that is, having others demonstrate an activity prior to engaging in it directly (Schunk, 2012). Although teachers can act as "ideal models" to help learners quickly develop their mental constructs of a concept or activity, peer models can in some ways offer a richer opportunity for learning. Depending on their performance level, peers can act as models for both ideal and non-ideal behaviour in order for the individual to vicariously develop their understanding of correct performance. Peer models may also serve to lower learner inhibitions and positively affect the learner's perceived self-efficacy if the peer successfully performs an activity that the observing learner does not believe he or she is capable of performing (Brown & Inoye, 1978; Schunk, 2012). Both Castle (2001) and Grenier (2005) describe accounts from docents who regularly participated in expert shadowing and modelling activities, and often museum educators would coordinate or fill the expert model/teacher role for these activities. Thus, it is likely that many museum educators would be familiar with the technique. How common these activities are for museum educators themselves to engage in as part of their own professional development, however, is not fully clear. Anecdotal evidence gathered in preparation for this study would suggest that engaging in this type of professional development activity is not unheard of among museum educators. This project sought to confirm and quantify the prevalence of these forms of peer learning within the overall professional development landscape of Canadian museum educators.

2.4.1.1 Summary of SC. Despite the advances that SC research has made in describing self-efficacy, self-regulation, motivation, and some of the social aspects of learning, it has received criticism as a theory proper for being fragmented and holding limited explanatory power (Boundless, 2016). These criticisms have been based, at least in part, on the limited interest elaborated in SC in the emotional and interest-value components of personality, or in how these may evolve over time. Research on SC has also largely focused closely on describing individual processes rather than on holistic investigations into the triadic system on which it is premised (Stone, 1998). In the next section, we will examine ecological constructivism, an emerging and complementary theory of learning that can potentially help us to resolve these weaknesses within SC.

2.4.2 Ecological constructivism. Similar to SC, ecological constructivism (EC) views learning as a process involving interactions between the individual and their environment. However, whereas SC proposes that environmental factors act on individuals to impact their learning in positive or negative ways, EC suggests that these interactions are neither unbiased nor unidirectional.

EC situates itself within a larger group of learning theories collectively referred to as "constructivism". While there are sometimes significant epistemological variances in the ways that various constructivist groups approach learning, common among these are the assumptions that (1) knowledge is continually being "constructed" in the mind of the learner based on their experiences, as opposed to being directly encoded in the learner's mind exactly as the information was presented to them; and (2) learning is an active process focussed on sense-making (Davis & Sumara, 2003; Kanuka & Anderson, 1999). Constructivist explanations of knowledge stand in contrast with empiricist and rationalist points of view in that personal

knowledge is seen as an inescapably subjective construal of the individual's lived experience, rather than the mental representation of an objective reality (Proulx, 2006). Davis and Sumara (2003) succinctly describe the constructivist conception of learning as "a complex phenomenon […] subject to an array of subtle and imposing, explicit and tacit, deliberate and accidental, social and biological influences" (Davis & Sumara, 2003, p. 130).

Within this constructivist discourse, and also drawing from systems theory, pattern theory, and sociocultural theory (among others), EC suggests that learning encompasses both internal processes (e.g., attention, rehearsal, reflection) and external processes (e.g., interpersonal communication, technology interactions, environmental cues). As such, socio-emotional factors and the unique features of the learner's environment are important considerations for understanding learning (Hoven & Palalas, 2016). Differences in personal characteristics and preferences can lead two learners to each cultivate very distinct and individual networks of social and material resources for learning. For example, introverted learners may feel uncomfortable participating in overtly social learning activities or environments and may prefer to engage with non-human resources and use intra-personal learning strategies (e.g., journaling) to a greater degree than extroverted learners. Thus, the learner's unique "ecosystem" of resources for learning takes on particular significance within EC. Moreover, differing personalities or activity preferences can predispose individuals to perceive, learn about, and act on very different aspects of a problem. This is an important consideration for any research related to independent learning since the individual's preferred approaches to learning can significantly shape the types of activities they elect to engage in.

Equally important within EC is a rejection of the idea that knowledge development is a process of accruing static information from the environment. Instead, learners, teachers, and

knowledge resources are considered mutually inter-dependent agents existing within a learning ecosystem (Jakobsdóttir, McKeown, & Hoven, 2010). As learners engage with other individuals or objects in their environment, they develop and express tentative understandings which are then received, adapted, and responded to in an iterative process of knowledge co-construction. While this is perhaps most visible within collaborative or cooperative learning situations where learners are engaging directly with peers, similar processes occur when learners engage with non-human resources, such as response cues presented by adaptive instructional software. This notion of a bi-directional environmental influence was the basis for Russian psychologist Lev Vygotsky's criticism of contemporary behaviourist studies which, he argued, spuriously extrapolated findings from lab animals to humans. Vygotsky noted that, unlike lab animals, humans have the unique ability to manipulate their environment to fit their needs (Schunk, 2012). Recognizing that individuals both affect and are affected by their environments, EC suggests that these reciprocal interactions result in a dynamic system in which learning and behaviour co-evolve as individuals come into contact with one another and with material resources. This dialogic process is argued to occur not only at an interpersonal level, but also within the learner individually via internal dialogue as he or she continues to learn about a topic or reflect on existing knowledge during different affective states (Hoven & Palalas, 2016). Thus, knowledge exists in a constant state of system-wide flux as the learner and elements in their environment continually receive, adapt, and respond to one another as they negotiate their understanding of the world. In this way, it could be argued that what a learner knows is inextricable from how she or he has come to know it.

Swiss psychologist Jean Piaget also saw learning as a product of learner-environment interactions, but differentiated between the physical and the social environments. To these, he

added two other determinants to his cognitive development model: biological maturation and equilibration (the tendency to seek resolutions to experiences that seem to be inconsistent with existing understandings) (Schunk, 2012). Since Piaget's ideas were first published, the importance of biological maturation on learning has been shown to be less straight-forward across the age continuum (Brandsford, Brown, & Cocking, 2000; Feldman, 2014). This said, Piaget suggests that environments and experiences which limit the subjection of the learner to only useful levels of stress can more readily nurture cognitive development. This lends further support to the idea that individual learning preferences and personality factors can impact learning. As proposed in EC, these might influence learning directly by modulating what is attended to, or indirectly as a product of the individual's cultivated social and material learning environment. This notion also implies that museum educators are likely to preferentially seek professional development formats that are familiar and which correspond with their personal learning style preferences.

2.4.2.1 Summary of EC. Although EC has only very recently been proposed as a way of envisioning human learning, prior research and formal theory developed in other domains, including the work of the sociocultural theorists Lev Vygotsky and Jean Piaget, do lend support to the premises of EC.

Similar to SC, EC suggests that learning involves processes internal to the learner as well as interactions between the individual and their environment. By accounting for personality and learning preference dimensions within its explanations of behaviour and learning, and by recognizing that these occur within dynamic social systems, EC conceptions can help to resolve some of the weaknesses of SC. Independent EC research along these lines might also be used to

complement the more established SC literature on learning by toggling between individual and systems-level views of knowledge development and behaviour change over time.

This study seeks to clarify the relative influence of situational and personal factors on the professional development decisions of museum educators, as well as the ways in which museum educators use their social and material environments for professional development. As such, it incorporates both SC and EC conceptualizations of learning. By marrying the cognitive approach of SC with the sociocultural approach of EC for interpreting learner-environment interactions, the proposed study attempts to develop a more holistic picture of the dynamics affecting the professional development patterns of Canadian museum educators than either approach would be capable of offering on its own.

Given that learner-environment interactions can take a multitude of forms, the following section describes the typology and organizing lens that will be adopted for categorizing museum educator professional development activities within the proposed study.

2.4.3 Learning interactions. Inspired by Moore's (1989) suggestion that learning is the result of interactions between the learner, the teacher, and the content to be learned, Anderson and Garrison (1998) proposed that individual interactions between any pair of these three elements (i.e., student-content, student-teacher, student-student, teacher-content, teacher-teacher, content-content) were factors capable of directly or indirectly supporting learning. Anderson (2003) further acknowledged that it is not only formal instructional interactions that induce learning, but that informal interactions within and outside the classroom can also bring about learning. In this way, museum educators' professional development activities, communities of practice, networked teaching-learning resources, and constructivist approaches to museum programming are all considered capable of influencing visitor learning.

2.4.3.1 Interaction Equivalency Theorem. As a further refinement of Anderson and Garrison's (1998) conceptualization of educational interactions, Anderson (2003a) proposed a model for these six interaction types. His Interaction Equivalency Theorem (IET) posits that:

> Thesis 1: Deep and meaningful formal learning is supported as long as one of the three forms of interaction (student-teacher; student-student; student-content) is at a high level. The other two may be offered at minimal levels, or even eliminated, without degrading the educational experience.
>
> Thesis 2: High levels of more than one of these three modes will likely provide a more satisfying educational experience, though these experiences may not be as cost or time effective as less interactive learning sequences.
>
> (Anderson, 2003a)

Since its first publication, IET has gained the attention of educational researchers and practitioners. Rhode (2007; 2009) investigated learner preferences for various interaction types, and proposed amendments to the model by differentiating between formal and informal modes of each type of interaction. Rhode also suggested incorporating two of Dron and Anderson's (2007) group engagement types (“network” and “collective”) into the model, while simultaneously—and inexplicably—eliminating teacher-teacher interactions from the model. In a large-scale study of second-language learners in two countries and in three languages, Miyazoe and Anderson (2010a) confirmed distinct learner preferences based on the course context (i.e., delivery format and content area).

In 2009, Bernard, et al. published a meta-analysis of studies exploring the effect of learner interactions on both attitude and achievement. Their analysis confirmed that student-student and student-content interactions have more positive effects on attitude and achievement

than student-teacher interactions, and that course designs that exclusively feature student-content interactions had greater effects on both achievement and attitude than any other design type. Bernard et al.'s study also hinted at a potential ceiling effect for achievement based on interaction intensity. The idea that interaction quantity offers diminishing returns at higher levels was confirmed by Castaño-Munoz, Sancho-Vinuesa and Duart (2013) for distance education, though they found this trend to be less straight-forward for face-to-face education.

Miyazoe and Anderson (2010b; 2011) have offered further adjustments to the IET model by adding two additional theses that each echo Thesis 1 in wording and intent, but referencing the impact of teacher interactions and content interactions, respectively:

> Thesis 3: Deep and meaningful formal teaching is supported as long as one of the three forms of interaction (teacher-student; teacher-teacher; teacher-content) is at a high level. The other two may be offered at minimal levels, or even eliminated, without degrading the educational experience.
>
> Thesis 4: Deep and meaningful formal learning and teaching is supported as long as one of the three forms of interaction (content-student; content-content; content-teacher) is at a high level. The other two may be offered at minimal levels, or even eliminated, without degrading the educational experience.

Miyazoe and Anderson (2010b; 2011) also suggest that the research on IET to date has effectively confirmed Thesis 1 through empirical testing, but that Thesis 2 has been more difficult to answer and that more research is required. No published studies to date have investigated teacher-centred or technology-centred interactions from the point of view of IET or have attempted to relate prior studies to Thesis 3 or Thesis 4. Since, effectively, Theses 3 and 4 together comprise two-thirds of the IET model and are yet to be confirmed, this is a very

important research gap that must be filled. In asking how museum educators seek to learn from their peers, new instructional content, and their students, the proposed study can provide preliminary data to help inform future research into the ways in which teacher interactions outside the classroom contribute to effective teaching (Thesis 3). In its current form, IET suggests that for any educational experience six dyadic interaction types between learners, teachers, and content exist, with each dyad being at one of four levels of intensity (none, low, medium, high) at any given time (Figure 4).

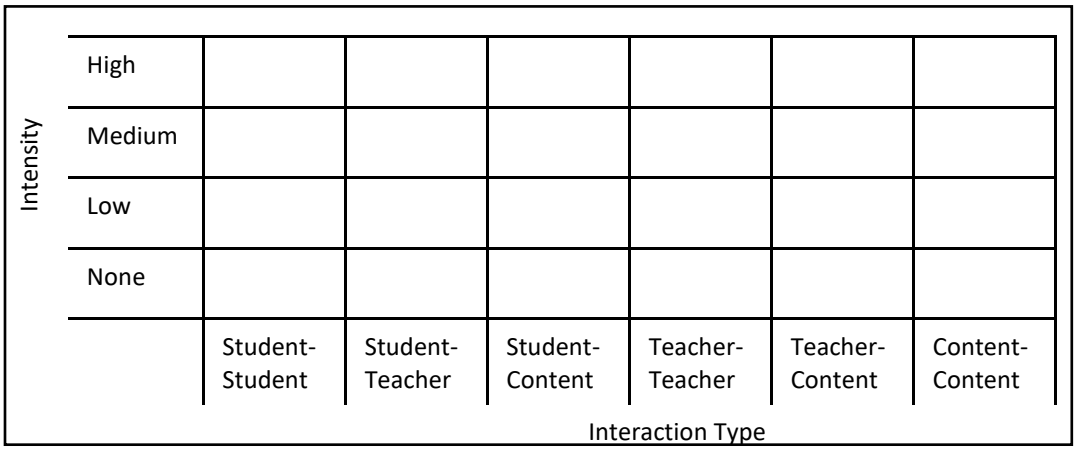

Figure 4. Instructional interaction types and intensities according to IET.

Finally, it is worth noting that, as it is currently proposed, IET leaves several questions unanswered regarding the nature of the six learning interactions that it proposes. For example, by combining peer interactions with personal-reflexive interactions within a single category (i.e., teacher-teacher, student-student) it is implied that these activities are commensurate. Similar assumptions are made by grouping teaching-oriented and learning-oriented interactions under a single teacher-student category. Whether the processes involved in improving learning and in improving teaching through teacher-student interactions are the same remains to be seen. Unfortunately, an in-depth exploration of these questions is beyond the scope of this study.

2.5 Museum Educator Learning as Interaction

The matrix of interactions and intensities illustrated in Figure 4 can potentially be helpful for envisioning the professional development landscape of docents and museum educators as described by Bailey (2006), Castle (2006), and Grenier (2005). By grouping museum educators' activities according to the three teacher-related interactions—that is, as interactions with peers (teacher-teacher), interactions with museum objects and related information (teacher-content), and interactions with visitors (teacher-student), we might start to get a sense of the personal learning environments that museum educators cultivate in their pursuit of professional development (see Table 2).

Table 2

Museum Educators' Professional Development Activities

Teacher-Teacher* interactions	Teacher-Student interactions	Teacher-Content interactions
Participating in peer group discussions	Praxis	Reading books
Shadowing others	Dialogue	Attending lectures
Modelling experts	Post-visit surveys	Self-directed investigations
Mentorship		
Briefing/Debriefing		
Journaling		
Practice feedback		
Rehearsal		

*including reflexive interactions

As Hirumi (2013) notes, however, it is not always straight-forward categorizing complex learning activities into single interaction types or intensity levels as much depends on the intents

and dynamics of the interaction and those involved. For this reason, the above chart should be read as simply illustrating a point. An accurate charting of museum educators' professional development activities requires direct conversations with museum educators to confirm which category is most appropriate for a given activity. That said, the above example shows how Anderson and Garrison's (1998) categories could potentially provide a frame for conceptualizing the structure of museum educators' professional development activities.

2.6 State of Knowledge

The American Association of Museums' Standing Committee on Education's (2006) standards for museum educators call for museum educators to be both developers and consumers of professional knowledge and research related to the professional development of museum professionals. The existence of professional peer-reviewed journals, such as the Journal of Museum Education, would seem to suggest that museum educators are, in fact, attempting to develop and disseminate the formal knowledge of the profession. While Grenier (2009) reports on the variety of professional development activities that museum educators tend to pursue, including both opportunities taking place within participants' institutions and those undertaken independently, as Dudzinska-Przesmitzki and Grenier (2008) note, there is in fact very little else published on the training and professional development activities specifically of museum educators, and that the majority of peer-reviewed papers that are written by or for museum educators tend to be qualitative studies describing participant impressions that are "neither theory-informed nor theory generating" (p. 18). Indeed, the majority of papers currently being published within the field are exhibition reviews and interpretive or descriptive studies that report on the impact of the visit on visitors' (especially children's and families') knowledge and attitudes (Taylor & Neill, 2008). Very little is known about how museum educators make

meaning of their practice and what role the unique contextual setting of the museum has on shaping education practice. While interpretive studies do offer the profession a basic understanding of museum related learning, the dearth of empirical research leaves professionals floundering with too many unanswered questions regarding the efficacy of the various options available to them.

We also know very little about the nature of funding for Canadian museum educators' professional development activities, and whether their activities are being organized informally by themselves or peers or whether they are being officially sanctioned by their institutions. One participant in Davis's (2011) study does suggest that employees of Canada's National Museums have access to a limited pool of professional development courses offered through Parks Canada. Bailey (2006) confirms that some American museums do offer ongoing learning opportunities for their education teams, but she does not describe the prevalence of those opportunities across the sector, nor does she indicate whether the programs reported were designed specifically as opportunities for staff development or whether museum education teams were simply taking advantage of public programming already being offered by the institution. One participant in Bailey's study, however, does suggest that the larger institutions he has worked with tended to offer greater opportunities for professional learning than the smaller ones.

According to Castle (2006), despite consensus among museum educators that the profession would greatly benefit from a more thoughtful approach to training and professional development, funding constraints and staff reductions have made developing and testing potential models very difficult. Furthermore, museums can be highly political, hierarchical environments where donors and benefactors may have a great deal of influence over the institution's budgets and programs (Lord, 2007). As public, not-for-profit institutions, museums

are expected to be efficient while being beneficial to society (Banz Jr, 2009), and stakeholders may not always place high priority on education or staff development. Both Castle and Garcia (2012) describe instances where museum educators were discouraged from trying out novel programs due to anxieties from senior staff at the institution. Dudzinska-Przesmitzki and Grenier (2008) suggests that a comprehensive examination of the professional development practices employed by museums and the influence that those activities have on staff and volunteer practices would help museums to meet the learning needs of their staff in ways that are efficient, cost-effective, and meaningful to the participants.

Evans-Palmer (2013) calls for the development of methodologies for institutions to elevate educator self-efficacy, while both Dudzinska-Przesmitzki and Grenier (2008) and Taylor (2010) allege that the fields of museum education and adult education carry too many characteristics in common to continue developing mutually independent and redundant research streams. Anderson's (2003a) IET may be one way to begin building bridges between these professions.

To date, research on IET has focused on interactions where students are the active agents and formal program situations across a limited number of content areas. No published research could be found that focusses on the teacher- or content-oriented interaction types or on the impact of time or cost factors (Miyazoe & Anderson, 2011). Further, no research on IET has yet explored the model's potential usefulness for understanding informal learning participation patterns among community-based educators, or those of working professionals more generally.

2.7 Summary

This chapter explored the current state of practice of museum education, including the major features that make museum learning distinct from the types of learning typical in more

formal education settings. The continuing effort to professionalize the role of the museum educator was also discussed. In reviewing the varying formative backgrounds, role expectations, and basic professional development patterns of museum educators, it is not unreasonable to describe the museum education profession as being still in its formative years of development. Although many museum educators practising today may have limited formal education related to learning theories or teaching practice, the literature describes a collective spirit of professionals that takes the museum educator role as a leader in promoting learning among visitors very seriously. Practitioners have been reported to dedicate significant personal time and expense to developing their content knowledge and to honing their teaching skills.

Professional development and lifelong learning are professional habits, and various opportunities exist for including informal learning within a professional's overall learning landscape. By simultaneously examining the cognitive, affective, and social learning factors proposed by SC and EC, we can begin to develop a deeper understanding of how personal and workplace pressures may be influencing museum educators' decisions to participate in professional development activities. Adopting an IET lens for the proposed study provides an organizing model and gives shape to the collection of opportunities that individual museum educators have elected to participate in. Based on this theoretical perspective, Chapter 3: Methodology, will detail the methods and processes to be employed in answering the question "To what extent and in which ways do perceptions of personal investment serve to contribute to Canadian museum educators' decision to participate in formal and informal professional development activities?"

Chapter III

Methodology

In this chapter, I will describe the mixed methods research design adopted for this study. An overview of the nature of mixed methods research will ground a more detailed outline of the convergent mixed methods design chosen to examine the professional development behaviours of museum educators in Canada. The procedure adopted for both the quantitative and qualitative components of the study will be provided, including a review of the development protocol and preliminary trial of the study's two research instruments: a closed-response survey and semi-structured interview schedule. Summaries of the sampling strategy and analysis of the study data are offered. Finally, I will present a review of the psychometric and ethical considerations, and discuss the limitations/delimitations impacting the interpretation of the study's findings.

3.1 Definition of Mixed Methods Research

Also known as multiple methods, integrated or combined research, and hybrid design, mixed methods research is a research methodology in which both quantitative and qualitative data are collected, interpreted, and integrated (Creswell, 2014; 2015). Two important features make mixed methods a distinct approach to research. First is the inclusion of a theoretically-informed frame through which both the sequence and the processes of each type of data collection are rationalized. Second is the inclusion of a final data integration stage at which point the quantitative trends and qualitative narratives are merged and considered as a unified whole. In these ways, the value offered by each approach can be taken advantage of in order to develop a richer understanding of the research problem than either approach could offer alone.

Mixed methods research can be broken down into a small handful of primary designs, with each one capable of offering unique insights into the research problem. Convergent designs

collect and analyse both quantitative and qualitative data simultaneously with an intent to compare the findings of each data type. Sequential designs are two-phase designs in which the findings from one phase are used to help inform or interpret the other. Creswell (2014; 2015) describes the two types of sequential designs as *explanatory*, in which quantitative data are collected first, and subsequent qualitative data are used to help explain the quantitative findings, and *exploratory*, in which qualitative data is collected first, in order to inform the instrument design of the subsequent quantitative phase.

For this study, I chose to employ a convergent design as it permitted an equal focus to be placed on both the quantifiable and experiential aspects that contribute to the PD participation behaviours of museum educators. The following section describes this design as it was applied to this study.

3.2 Design

This project used a convergent mixed methods design. This design type entails using two different research methods in parallel, without any slackening in the rigour applied to the development, data collection, or analysis of either one. In the case of the present study, survey research (quantitative component) and semi-structured interviews (qualitative component) were employed.

As described earlier, convergent designs demand that the findings of the quantitative and qualitative components be merged and considered together as a final stage of interpretation. To accomplish this, I will address the results of each method by discussing the findings of each method in tandem relative to their IET category, as well as through a joint display table (see Chapter 6). To ensure that accurate and appropriate comparisons could be made between the two

data sets, each instrument was framed around the same core categories proposed by IET, namely teacher-teacher interactions, teacher-student interactions, and teacher-content interactions.

3.2.1 Procedure. As previously mentioned, this mixed methods study included two phases: a closed-response survey component, and a semi-structured interview component. The design required that survey responses from the first phase be used to identify potential interviewees for the second phase. Thus, quantitative data collection was completed prior to beginning qualitative data collection. Although this process resulted in the two phases occurring consecutively, because the information from one component was not being used to inform the instrumentation or interpretation of the other, the study design remains convergent by definition.

The project began by soliciting participation via announcements through Canadian museum educator groups familiar to the primary researcher (see Appendix H Museum Communities of Practice). The announcements invited interested museum educators to participate in the online survey component of the study. A final question on the survey asked participants to submit their contact information if they wished to be contacted to participate in a telephone interview. Once survey data collection was complete, potential interview participants were identified and contacted to confirm their continued interest. Interview times were arranged and completed by telephone.

Once data collection for both components was complete, descriptive and correlational statistics were calculated on the quantitative data, and interview recordings were transcribed. The interview transcripts were sent electronically to interviewees to confirm their accuracy prior to initiating qualitative analysis. All transcripts were independently coded by the primary researcher and a research assistant. The research assistant was a former teacher and journalist known to the researcher, who was familiar with the process of narrative analysis and coding. Four telephone

meetings were held to orient the research assistant on the project, discuss preliminary findings and resolve any discrepancies, and finally to develop concept definitions. The preliminary telephone meeting confirmed that the assistant possessed the pre-requisite skills and was used to train her on the coding requirements of the project. This meeting included a review of the Tri-Council Policy on the Ethical Conduct for Research Involving Humans, and agreement by the assistant to respect the confidentiality of participant data. The interview transcripts were then anonymized and forwarded to the assistant. The coding process followed a descriptive phenomenology paradigm, whereby significant statements from the transcripts were identified and synthesized to reveal a common essence of both "what" and "how" the identified phenomena are experienced. Initial coding was completed by each team member independently, using both open coding and focussed coding based on the activities described in the survey. This dual approach to coding allowed the research team to uncover narratives related specifically to the PD activities investigated within the survey, as well as permitted the identification of additional activities or factors impacting museum educators in their pursuit of ongoing professional learning. During this phase, neither coder was aware of the findings of the other. A second telephone meeting was held to discuss each coders' preliminary codes and to establish a standardized code list from which subsequent coding would proceed. Independent coding continued with each coder revising their coded transcripts using the standardized code list and confirming that their preliminary findings continued to be accurately reflected by the revised codes. A third telephone meeting allowed the research team to compare findings, discuss any discrepancies, and develop consensus for all codings. Several email exchanges and a final telephone meeting allowed the research team to develop and agree on essential descriptions for each of the identified codes and themes (see Appendix F).

Finally, the results from the statistical and textual analyses were assembled in a joint display chart to facilitate cross-comparison. The results of the quantitative and qualitative analyses are discussed respectively in Chapter 4: Quantitative Findings and Chapter 5: Qualitative Findings; the results of the joint analysis are discussed in Chapter 6: Comparative Analysis and Discussion. A diagram outlining the above procedure in visual form has been provided in Appendix A.

3.2.2 Research instruments. As previously mentioned, the study employed two instruments: an online closed-response type survey, and a semi-structured interview schedule. The format and criteria used in developing each instrument is described below.

The online survey (see Appendix B) included 16 questions investigating 11 unique professional development formats. The survey was developed on the following premises:

a) The activity categories were based on the teacher interactions represented within IET (i.e., teacher-teacher interactions, teacher-content interactions, teacher-student interactions).

b) The individual activities that comprise each category were drawn in part from those described by Grenier (2005) and Castle (2006), and supplemented with additional common PD activity formats in order to offer a range of in-person and distance learning activities, both formal and informal, within each activity category (see Table 3).

c) The independent variables related to participant perceptions of cost were based on those described within IET (i.e., time, cost, energy). Additional independent variables related to participant perceptions of benefit (i.e., skill development, job

security/advancement, personal fulfilment, comfort with the format), were also included.

d) Demographic details related to participant age, years in practice, and museum type were included to support addressing research question S2. Supplementary demographic details, including gender and region, were also considered for inclusion but as these did not directly support the research questions they were consciously omitted from the final survey to limit the risk of respondent fatigue and maintain respondent anonymity.

Table 3

PD Activities by Category

Learning from Peers (teacher-teacher interactions)	Reflective Learning (teacher-teacher interactions)	Learning from Learners (teacher-student interactions)	Learning from Content (teacher-content interactions)
Conferences and courses	Self-reflection	Post-visit feedback	Self-study resources
Informal groups	Self-assessment	Praxis	Professional reading
Membership-based groups			Self-directed investigations
Mentorship			

The semi-structured interview schedule (see Appendix C Semi-Structured Interview Schedule) included six questions. Questions were based on the teacher interactions represented within the IET (i.e., teacher-teacher interactions, teacher-content interactions, teacher-student interactions).

3.3 Data Collection

Due to the distributed nature of the population, convenience sampling was employed for the quantitative component of the proposed study. Eligible participants included staff or volunteer leader museum educators within Canada whose role includes educational program development responsibilities. The sample was accessed via electronic notices soliciting participation through several museum educator associations and online social networks (see Appendix H). Individuals were invited to participate in an online survey hosted on Athabasca University's LimeSurvey system (see Appendix B). An initial question on the survey asked respondents to confirm their role as a Canadian museum educator; based on their response to this question, ineligible respondents were recused from completing the remainder of the survey. The scheduled quantitative data collection period was during October and November, 2016. However, it was revealed after initiating data collection that this period disadvantaged some museum educators working within parks and gardens, which often minimize operation between October and April annually. As a result, data collection was extended into December, 2016 to allow additional time for participation announcements to reach museum educators whose service hours had been reduced during this period. At the end of the extended data collection period, all participant data was migrated to a secure off-line database and all online versions of the data were destroyed.

Purposive sampling was employed for the qualitative component of the study. Interview candidates were identified based on positive response to a question within the survey asking participants to indicate their willingness to participate in a semi-structured interview. Interview participants were then selected based on their responses to questions within the survey related to their total years in practice and their current practice setting. These selection criteria ensured that

the constructed narratives represent voices from across both the career cycle and the museum sector. Interviews took take place via telephone, using a third-party teleconferencing service (Reach Conferencing) between November 20 and December 15, 2016. Due to a delay in funding, digital recording files in MP3 format were not available. Instead, the interviews were transcribed from a streaming file link provided by Reach Conferencing. This enabled the creation of detailed and accurate transcriptions of the interviews, which were subsequently anonymized and used for analysis. A sample segment from one of the transcripts illustrates how coding analysis was implemented (see Appendix D).

3.4 Data Analysis

As two instruments were used in collecting the study data, an online survey and semi-structured interviews, data analysis also proceeded in two phases. The first phase used data collected in the surveys to address research sub-questions S1 and S2. The second phase of analysis focussed on the data collected in the interviews to address research sub-question S3. The processes employed for each of these phases is outlined below.

To answer research sub-questions S1 and S2, descriptive and correlational statistics were calculated on participant data using SPSS software, as follows:

S1: To answer the research sub-question “To what degree can perceptions of personal cost and benefit be used to predict museum educators' participation in professional development activities?” the following analyses were completed:

a) To understand any unique effects, correlation coefficients (Spearman's rho) were calculated for the independent variables of perceived cost (i.e., time commitment, personal energy input, financial costs, employer support) and perceived benefit (i.e., skill development, job advancement/security, personal interest, enjoyment of format),

as compared to the dependent variable, participation, for each professional development activity. Initially, I surmised that this analysis might result in moderately sized negative correlations with the dependent variable for the independent variables related to cost, and moderately sized positive correlations with the dependent variable for the independent variables related to benefit. Indeed, as discussed in Chapter 4: Quantitative Findings, some variables did produce moderate correlations. However, the degree of correlation varied significantly across both the cost- and benefit-related variables.

b) To understand any cumulative effects, linear regression models for the independent variables of perceived cost (i.e., time commitment, personal energy input, financial costs, employer support) and perceived benefit (i.e., skill development, job advancement/security, personal interest, enjoyment of format), as compared to the dependent variable, participation, for each professional development activity were calculated. In the study proposal, I hypothesized that that this analysis might result in moderately equivalent weights for each of the independent variables in predicting the dependent variable. However, as discussed in Chapter 4: Findings, some variables produced stronger correlations than anticipated, resulting in uneven weight distributions in the resulting regression models.

S2: To answer the research sub-question “To what degree can measures of age, formal education level, and years in practice be used to predict the types of PD activities museum educators are likely to participate in?” the following analyses were completed:

a) To understand any unique effects, correlation coefficients (Spearman's rho) were calculated for the independent variables of age, formal education level, and years in

practice as compared to the dependent variable, participation, for each professional development activity. I originally proposed that this analysis might result in moderately sized negative correlation coefficients for each of the independent variables with the dependent variable for formal events, and moderately sized positive correlation coefficients for less formal events. However, as discussed in Chapter 4: Quantitative Findings, no significant correlations were revealed for any of these variables.

b) To understand any cumulative effects, linear regression models for the independent variables of age, formal education level, and years in practice as compared to the dependent variable, participation, for each professional development activity will be calculated. In the study proposal, I suggested that this analysis might result in moderately equivalent weights for each of the independent variables in predicting the dependent variable. However, results of this analysis revealed negligible cumulative correlations for these variables, as described in Chapter 4: Quantitative Findings.

To answer research sub-question S3, qualitative textual coding and analysis of the interview transcripts was performed using NVivo software as described below.

S3: To answer the research sub-question "How do museum educators feel their participation in professional development activities contributes to their professional growth as educators?" the following analyses were completed:

a) Interview recordings were transcribed and their contents verified by participants.

b) Anonymized transcripts were coded using qualitative textual analysis based on phenomenology methodology in order to reveal textural and structural themes. Focussed coding based on the 11 professional development activity areas and

employer supports investigated in the survey component allowed the collective experiences of those activities to be revealed, while open coding facilitated the identification of additional activities and decision-making criteria used by participants in their pursuit of ongoing professional learning. These findings are discussed in detail in Chapter 5: Qualitative Findings.

Upon completion of quantitative and qualitative analyses, the findings of both components were brought together and addressed through descriptive comparison and joint display relative to their IET category (see Appendix F). The results of this final phase of the study are discussed in detail in Chapter 6: Comparative Analysis and Discussion.

3.5 Validity and Reliability

To improve the validity and reliability of this project, the following activities were undertaken:

- Survey items were based on concepts drawn from existing literature to improve face and construct validity. Specifically, the activity categories and perception-related variables (time commitment, personal energy input, financial costs) were drawn from the IET model; individual activity types were based on those described in Castle (2006) and Grenier (2005). Additional common PD activity types were identified and included to ensure a range of both formal and informal, as well as in-person and distance learning opportunities were represented.
- The survey instrument and interview schedule were pilot tested on a small number of museum educators (3) to ensure consistent understanding. Trial participants were solicited via two online social networking groups for museum educators. A link to the online survey draft was sent to trial participants via email, along with a request for

them to note any areas of unclear wording, technical difficulty, or conspicuous oversights. During the week following survey completion, each participant met with the researcher by telephone to complete the interview component. Immediately following each interview, the researcher debriefed with the participant on their experience and reflections related to each component of the trial. Participant feedback confirmed the overall clarity and usability of both instruments and requested minor wording adjustments for the survey questions related to employment setting and the activities included under the Informal Groups category. Each of these questions was adjusted accordingly. No adjustments to the interview schedule were requested.

- Due to the logistical difficulty of reaching all eligible Canadian museum educators directly, participation was largely solicited via notices in member newsletters, list-servs, and the social media channels of various Canadian national, provincial, and local museum-related associations and networking groups. Although these outlets represent approximately 6000 points of contact in total, it is understandable that individuals may be members of multiple organizations and that many recipients within these groups may not be in educator roles. Therefore, it was difficult to calculate with certainty the total unique individuals belonging to the target population to receive notification of the study. Initially, I proposed a minimum sample of 323 based on an estimated sample frame of 2000 museum educators in Canada and using a confidence level of .95. However, data collection resulted in a final sample of 172. Although lower than anticipated, this sample provided a sufficient number of cases from across the museum sector to enable the statistical analyses originally proposed.

To ensure the level of authenticity of the qualitative components of this project, the following activities were undertaken:

- Interview questions centred on the interaction categories described by IET.
- Interview participants were selected based on their responses to survey questions related to their museum type, age, and years in practice. Regional details deduced from their contact telephone and/or email address, if provided, were also considered. These criteria helped to ensure the interview responses represented a range of voices from across the profession.
- Interview participants were required to confirm the accuracy of their interview transcript prior to initiating coding.
- A research assistant was recruited to act as a secondary coder of the transcripts. As discussed earlier, coding was performed independently by both researchers and telephone meetings were held to discuss findings and develop consensus on any discrepancies.

3.6 Delimitations

The study sampled educators employed as staff or working in a volunteer leadership capacity within a museum setting. For the purposes of this project, any Canadian institution that falls within the International Council of Museums definition of a museum was considered an eligible museum setting; and, any individual whose role formally includes educational program design and oversight duties was considered an eligible educator. While it is recognized that many supervised education volunteers, such as docents, take their role very seriously, these positions are not responsible for program design decisions and are not typically subject to the same mutual obligations to the museum as are staff and volunteer leaders with regard to access to resources

and professional development. For these reasons, the study did not include individuals engaged as docents or in similar roles.

3.7 Limitations

Several challenges presented by the convenience sampling method and the research instruments employed in this study affect the interpretation of study data and limit the potential to generalize findings across all museum educators in Canada. This section will describe each of these limitations in detail.

3.7.1 Sampling limitations. Given the nature of convenience sampling and the variety of settings that fall within the definition of a museum, the study did not receive sufficient participation to enable a high degree of generalizability of the findings to educators working within all types of museum settings. Limited responses were received from some museum sectors and geographical regions.

Many parks and gardens seasonally close as of Thanksgiving weekend in Canada. Due to the timing of data collection, this hampered participation from this segment of the population. The Canadian Botanical Association agreed to share notice of the study in their member newsletter, however due to the newsletter schedule, notices did not reach members until after the original data collection deadline. Notice circulation delays also affected participation among educators working within the National Parks system, as well as at zoos and aquariums. To promote participation from these segments of the population, several museum sites were contacted directly and data collection was extended to mid-December. Despite these accommodations, participation among museum educators in these settings remained limited.

A few provinces and territories either do not have a local association or were unable to disseminate news of the study within their region. The survey did not ask participants to indicate

their province of work. Therefore, it was difficult to determine how many museum educators within each region were aware of and participated in the study. To address this potential limitation, notice of the study was also circulated using the Canadian Heritage Information Network list-serv, a national email group dedicated to facilitating communication and the dissemination of sector-relevant news among professionals working within the heritage and culture sector, including those working with museums.

Language barriers may also have impacted participation rates in Quebec, and to a lesser degree New Brunswick, given that the survey was offered only in English. Since the survey did not require individuals to indicate their province of work, it is not certain whether any or all of the above communication challenges affected regional response rates. Due to this uncertainty, the study cannot claim that findings represent the views or experiences of museum educators working within all regions of Canada.

It is also possible that self-selection bias impacted participation rates. Individuals who do not pursue as much ongoing learning as they feel is professionally expected may have been reticent to have their habits documented. Further, individuals who enjoy participating in social knowledge generation/exchange activities or who have academic backgrounds may have been more apt to participate in this study.

Finally, individuals who belong to a professional association may be more consciously invested in their professional practice and may have a higher professional development participation rate than non-members. Several association-based communication vehicles were leveraged to reach the target population. To combat the risk of data skewing, all study notices included a request for recipients to share news of the study and survey link with peers who may

not belong to the association. In addition to the more formal contact outlets, several informal networking groups were contacted and notices distributed via their social media channels.

In total, only 53.25% (n=172) of the original 323 response target was received. As the data did show a skew toward responses from younger professionals (skew=.728), this may also be considered as an influencing tendency in the generalizability of the study findings across the career cycle. This will be discussed in more detail in Chapter 4: Quantitative Results.

As a result of the above sampling challenges and limitations, study findings may not represent the full range of views or PD practices of museum educators across the Canadian museum sector as a whole.

3.7.2 Methodological limitations. Several limitations related to the study's methods and instruments also impact the interpretation of findings, including survey participant attrition, granularity of the activity groupings, parsimony among the independent variables, and limitations inherent to interview research.

Several respondents who accessed the survey and answered the demographic questions did not complete the survey in its entirety. Of the 172 total survey participants, only 151 continued as far as the first question related to PD participation (Q6), and only 121 continued as far as the final question related to PD participation (Q16). This represents a difference of 30 responses (19%) between the first and final questions related to PD participation. While this attrition was taken into account in calculating the activity participation rates described in the following chapter, the true participation rates and perceptions of all survey respondents for all PD activities cannot be stated with certainty.

Post-hoc factor analyses revealed a possible conflation of the benefit factors "Interest" and "Enjoyment of Format". Strong correlations between these two variables for certain PD

activities–though not all–suggests this may be the case (r=.591-.857). Due to this potential ambiguity, we cannot consider the findings of one factor without simultaneously considering the findings of the other.

In balancing survey comprehensiveness with convenience for respondents, it is possible that some common PD activities may not have been included. Thus, the absence of discussion related to a particular activity must not be assumed to represent a lack of relevance, interest, or participation among museum educators in that activity. Similarly, due to the bundling of specific activities into groupings of related activities, it is impossible to ascertain whether participant responses to any activity group relate to one or more specific activities within that group. For example, the activity group Conferences and Courses is defined within the survey as encompassing "professional conferences, hands-on workshops, academic courses, and similar in-person events which focus on improving museum teaching practice through formal knowledge sharing or instruction". While responses to this activity group does demonstrate general participation rates and perceptions of these forms of professional development, it is impossible to infer that MEs have each program type listed within that activity group available to them, or which among these they are actively pursuing.

Limitations related to learner preferences may also impact the interpretation of study findings. Survey questions asked if individuals have participated in a specific activity but did not directly enquire about their affinity for a particular format. Thus, we cannot claim to understand museum educator preferences. This study can only describe participation rates as they relate to the past or current circumstances and perceptions of cost/benefit for the individual. For example, some employers may mandate participation in an activity. For this reason, although employer

support might result in a positive correlation, the weight the individual may place on other cost/benefit variables to the same activity under alternative circumstances cannot be inferred.

The nature of qualitative interview research also presents challenges that can limit the findings of this study. This research method is time- and resource-intense, demanding that no fewer than two individuals independently code the interview transcripts, and subsequently collaborate to ascertain the significance of specific participant statements and clarify emergent themes or trends. For this reason, interview research is often deliberately limited to a small number of research participants. This study included 6 interviewees, comprising one individual per museum type.

Also inherent to qualitative research is the potential for researcher bias to skew findings. Every effort was taken to mitigate against this potential. For example, a research assistant was hired to act as an independent secondary coder for this study, and several meetings were carried out to discuss and reconcile discrepancies in coding. Coding discrepancies may be symptomatic of the introduction of personal bias, and thus these instances were discussed in detail by the research team and considered resolved only once consensus had been reached.

The sampling challenges described above, namely, participant attrition, activity grouping, factor conflation, and limitations inherent to interview research limits the interpretation of the study findings.

3.7.3 Summary. Several challenges related to the study methods and data sample limit the interpretation of study findings. These include low response rates from museum educators working with parks/gardens and zoos/aquariums, unknown regional representation, potential self-selection bias, participant attrition, data granularity, and researcher bias inherent to

qualitative data interpretation. Some of these limitations open up areas for future research, which will be discussed in Chapter 7.

3.8 Researcher Resources and Skills

As a member of the Canadian Educational Researchers' Association (CERA) and its sub-group, the Special Interest Group on Education Mediation and Museums (SIGEMM), I was able to access the member news outlets of that group for sharing information about this research project and disseminating a call for participation. Online and/or email-based opportunities for disseminating notices for research participation through several additional general museum and museum education specific professional associations familiar to me were also leveraged. Finally, I am connected with professional networks of museum educators in Toronto, Hamilton, and Ottawa, Ontario, who agreed to help disseminate a call for participation through their extended networks. None of the contact individuals for these groups were personally known to me.

This research project required only a small handful of technologies, all of which the author had prior experience using and required limited expenses (see Appendix G Budget):

- LimeSurvey, an online surveying service provider, was used to house the quantitative survey instrument. A Canadian data server is maintained by Athabasca University (AU) for faculty and students wishing to use LimeSurvey in their research. This service is offered without charge to AU faculty and students.
- Reach Conferencing, a Toronto-based teleconferencing service provider, was used for the semi-structured interviews. Although per-minute line charges were incurred for each interview, calls were recorded for the purposes of transcription without charge.

- Quantitative data analysis was completed using SPSS software. The author has a current license for use of this software and no additional costs were incurred.
- Qualitative data analysis was completed using NVivo software. The purchase of an annual license renewal was required due to the timeline of the study.

Scholarship funding to help offset the above expenses were secured through Athabasca University's Graduate Student Research Fund. A detailed budget breakdown has been provided in Appendix G.

3.9 Ethical Considerations

As with any research project involving human subjects, there are certain ethical considerations which were considered in designing, collecting data, and reporting this study:

1. In any formal organization, power relations exist. Research data could be misunderstood or misappropriated by those with power over others and used to cause intentional or unintentional distress or harm. Within the context of this project, the study's findings can potentially be used by museum employers to justify the cessation of support for existing PD programming or as justification for rejecting requests for resources for new activities on the basis of limited value. Care has been taken in writing up this report to emphasize that the findings represent collective trends and individual perceptions and stories, and do not represent or claim to represent the actual costs or impact to practice associated with specific PD activities for all museum educators across the sector.
2. Because the total number of each type of museum in Canada (e.g., zoos, cultural museums, botanical gardens, etc.) is relatively small, employers may be able to recognize or suspect that their institutions have been described within the participant

anecdotes included in this report. As a result, steps were taken to protect the anonymity of study participants during data collection, analysis, and reporting. Only a first name and one contact method were requested of the survey respondents who offered to participate in the telephone interview component of the study. Submission of these details was entirely voluntary. This information was deleted from the dataset prior to any data analysis. Further, potentially identifying information about individual institutions reported within the interview quotes has been removed.

3. As an educational researcher and not a current museum professional, I am investigating the practices of a profession of which I am not a member. As an outsider reporting on the practices of an emerging profession, I have attempted to exercise extreme prudence in collecting data and reporting my findings as neutrally and as fairly as possible.
4. Finally, to help obtain sufficient data to reach statistical power, modest participation incentives were offered for both the survey and interview components of the study. It is known that the promise of rewards can potentially bias participant reporting, compromising the validity of study findings (Schunk, 2012). The risks and potential benefits of offering a participation incentive were carefully weighed. Two prize draws, each for one $50 gift-card, were held for participants of each component of the study (one prize per component).

The proposal for this study was approved by Athabasca University on October 20, 2016, and the ensuing study proceeded without deviation from the approved proposal.

3.10 Summary

This chapter described the nature and use of mixed methods research and discussed the convergent mixed method design used for exploring the professional development decisions of Canadian museum educators in this study. The study design used: (1) survey research to document the personal characteristics and perceptions of museum educators for various professional activities as they relate to participation decisions; and, (2) semi-structured interviews to record the narratives of individual museum educators with regard to their personal experiences learning from various sources, whether formally or informally. Both the survey instrument and the interview schedule were framed around the IET interaction categories of teacher-teacher, teacher-self, teacher-student, and teacher-content, as discussed in detail in Chapter 2: Review of the Literature.

To address the research question, "To what extent and in which ways do perceptions of personal investment serve to contribute to Canadian museum educators' decision to participate in formal and informal professional development activities?", descriptive and correlational statistics (Spearman's rho, linear regression models) were calculated on the quantitative data, and textual coding based on a phenomenological approach was applied to the qualitative data. The findings of these quantitative and qualitative analyses are individually addressed in Chapter 4: Quantitative Findings and Chapter 5: Qualitative Findings. Combined findings are described in Chapter 6: Comparative Analysis and Discussion.

Museum educators were invited to participate in the online survey component of the study via notices through known Canadian museum educator associations and networks. Interview participants were selected from among those who participated in the survey, based on their indication of willingness to be interviewed, the museum type(s) in which they work, and

their total years in practice. Options for funding continue to be explored to recover the financial expenses incurred in performing this study.

Great care was taken in designing this study to minimize unintended bias, including implementing a pilot test of both the survey instrument and interview protocol. Certain limitations and ethical risks are acknowledged, including actual and/or potential skewing of findings resulting from the convenience sampling method employed, challenges arising from the design of the survey instrument, and the interpretation of interview data. The impact of these considerations on the interpretation of study findings remains within the limits of what might be reasonably expected for a study of this nature. Finally, due to the relatively small population of museums in Canada, extreme care has been taken to ensure the anonymity of participants and their employers within this report.

Chapter IV

Quantitative Results

This chapter will describe the individual results of the quantitative analyses of the sample data related to the professional development perceptions of Canadian museum educators. It is structured in two main sections. The first section provides an overview of the collected sample of Canadian museum educators through descriptive statistics. The second section recounts the results of the correlational statistical analyses employed in analysing the online survey data related to research questions S1 (“To what degree can perceptions of personal cost and benefit be used to predict museum educators' participation in professional development activities?”) and S2 (“To what degree can measures of age, formal education level, and years in practice be used to predict the types of professional development activities museum educators are likely to participate in?”). Summary tables of the various analyses are included, and significant correlations are highlighted.

4.1 Sample Characteristics

This study sought to understand the views and experiences of Canadian museum educators regarding their professional ongoing learning. In total, 172 museum educators from across Canada participated in the study.

To understand participants’ perspectives, and possible reasons for variation within their collective experiences, we must recognize that the museum sector itself encompasses a broad range of institutions. In their report of sector trends, the Department of Canadian Heritage (DCH) describes five main heritage institution types based on the nature of their collection: Art Galleries, Museums, Historic Sites, Archives, and Zoos/Botanical Gardens (Government of Canada, 2016). These broad categorizations provide a helpful starting point for understanding the experiences of museum educators since organizational structures derived from a museum’s

collection can have a strong impact on public expectations and the types of educational programming the museum offers. These factors may also impact the minimum educational and professional background requirements that institutions place on their educators. Thus, it is not unreasonable to expect variations in the professional development perceptions and experiences of educators working across these various segments and at various points within their career. To examine the potential impact of these factors on the professional development activities of Canadian museum educators, survey participants were asked to indicate their work setting, age, experience level, and educational background. This section explores the demographic breakdown of the sample along these factor lines.

4.1.1 Participants by museum setting. The museum types investigated in this study reflect, in part, those described by the DHC (Government of Canada, 2016). The DHC report's Archives category was not included as a formal category for this study as it was felt to represent a distinct area of heritage conservation practice. As well, to facilitate deeper insight into possible variations across the sector, the proposal for this study further sub-divided some of the remaining DHC categories, resulting in a total of seven museum categories that were included in the survey: Art Galleries, Aquaria/Zoos, Historic Properties/Sites, Human/Natural History Museums, National/Provincial Parks, Botanical Gardens, and Science Centres. An open-response option was also included, which allowed participants to describe their museum setting if it did not appear to fit within the above categories.

The sample comprised 172 Canadian museum educators working across all seven of the museum segments included in the survey. Due to segmental differences in response rates, as well as participant comments to the open-text question related to museum work setting, the original category list was revised to six categories in preparing this document. Participant response rates

for each of these six categories are provided in Table 4. It is important to note that several respondents indicated working simultaneously for multiple museum types. As a result, the sum of the responses for each category exceeds the total number of participants.

Table 4

Participants by Museum Sector

Sector	Total Responses[a]	Relative Representation
Art Gallery	24	13.95%
Aquarium/Zoo	5	2.91%
Historic Property/Site	58	33.72%
Human/Natural/Industrial Museum	62	36.05%
Park/Garden/Nature Reserve	14	8.14%
Science Centre/Science Museum	31	18.02%
Other	15	9.26%

Notes: [a] n = 172

Museum educators working within Historic Properties/Sites and Human/Natural/ Industrial museums comprise the largest proportion of the sample, representing 69.77% of all respondents. By contrast, Aquariums/Zoos received the fewest responses (2.91%). The relatively small number of zoos and aquariums currently operating in Canada may explain the response rate for this category. Participation among individuals working within Parks/Gardens/ Nature Reserves (8.14%) was also limited. The timing of data collection for this study, which coincided with seasonal closures for many open-air museums, may have been a factor impacting the response rate of educators working in this sub-sector. Finally, several respondents (9.26%) indicated working for a museum type not included in the original list, including

Children's Museums (3), Exhibition Facility (1), Planetarium (2), Hall of Fame (2), and Professional Association (1). The small sample sizes for these categories makes it difficult to state with confidence any segment-specific trends that may be implied by the data.

4.1.2 Participation by age and years of experience. To understand how age-related factors may be impacting on the professional development behaviours of museum educators, participants were asked to indicate their current age and the total years of experience they have as a museum educator. Age was measured in 10-year spans; experience was measured in 5-year spans. Table 5 illustrates the response rates based on participants' age.

Table 5

Participants by Age

Age	Total Responses[a]	Relative Representation
<25	6	3.51%
25-34	70	40.94%
35-44	48	28.07%
45-54	34	19.88%
55-64	11	6.43%
>64	2	1.17%

Notes: [a] n = 171

Response was received from across the career spectrum, with the median age of participants being 35-44. A slight skew toward younger professionals is apparent, however, with 44.45% of participants being younger than 35.

Additionally, respondents were asked to indicate the length of their experience working specifically as a museum educator. Responses confirm that the sample represents educators at all stages of their teaching career (see Table 6).

Table 6

Participants by Years of Experience as a Museum Educator

Experience (in years)	Total Responses[a]	Relative Representation
<1	2	1.16%
1-5	66	38.37%
6-10	39	22.67%
11-15	36	20.93%
16-20	12	6.98%
>20	17	9.88%

Notes: [a] n=172

Similar to participant age, experience level shows a slight skew toward newer museum educators, with 61.73% of participants having 10 years or less experience as an educator. As discussed in Chapter 3: Review of the Literature, many museum educators do not begin their careers as such, but will often find themselves moving from other areas of museum practice into educational roles as personal interests or institutional needs evolve. The similar distributions for Age and Experience suggest that such career changes may tend to occur early in one's career.

4.1.2 Education. Individuals who pursue higher education are exposed to multiple opportunities for developing critical skills that can lead to a greater self-awareness of their knowledge gaps and where to find the resources to help them address their learning needs throughout their career. They may also possess, or develop over the course of their education, a

level of comfort and internalized motivation toward lifelong learning. To examine whether formative educational factors may be impacting on the professional development patterns of museum educators, participants were asked to describe their educational backgrounds. Open-text options for each category allowed participants to describe the area(s) of focus for each credential they obtained. Table 7 summarizes participant responses to this question. It should be noted that participants were permitted to indicate all completed programs and not simply their highest level attained. As a result, the sum of the responses for each category exceeds the total number of participants in the study.

Table 7

Participants by Educational Background

Education	Total Responses[a]	Relative Representation
Certificate/Diploma	36	20.81%
Bachelor	123	71.10%
Master	76	43.93%
Doctorate	7	4.05%
Professional Certification	42	24.28%
Other	19	10.98%

Notes: [a] n=170

Many respondents indicated having completed more than one academic and/or non-academic program. The most commonly pursued credential was a bachelor's degree (71.10%). While many undergraduates continued on to pursue graduate degrees, several others elected to pursue alternative credentials, such as post-graduate certificates or non-academic professional certifications. Of the 36 individuals who completed a Certificate or Diploma, participant open-

text responses confirm that these include both post-secondary and post-graduate type programs. Responses to the Other category described the pursuit of stand-alone courses, private training programs and certificates, and academic program partial completions.

The most commonly cited areas of study for all levels of educational pursuits were Museum Studies and History. This is not surprising given the relative proportion of study participants who indicated working at a Historical Site/Property or Human/Natural/Industrial Museum. Other popular areas of formative study included Fine and Performing Arts (including Arts Administration), Humanities (including Art History), and Biological or Environmental Sciences. Education was also a common area of academic study, and one which deserves special consideration. As such, we will be exploring the education training of participants separately and in greater detail shortly. The non-academic programs described by participants tended to focus on job-related skills areas, such as marketing, specialized areas of teaching such as facilitation or interpretation, and management topics. Professional certifications through Canadian and American museum associations were also cited as an educational foundation for several of the participants.

4.1.2.1 Teacher training and studies in Education. As discussed in Chapter 2: Review of the Literature, many museum educators find themselves taking on educator roles without previous formal training in education. Educational studies programs equip students with essential knowledge of learning theories, strategies for helping learners to maximize their learning potential, and prepare them as advocates of lifelong learning. This familiarity can offer graduates a unique level of insight into their own learning patterns. Thus, it is plausible that museum educators who have completed formal programs in education may exhibit different behaviours or attitudes toward their own professional ongoing learning. To help uncover whether training in

pedagogy affects the professional development perceptions of museum educators, a post-hoc analysis of participant responses regarding their educational background was completed. Responses that specifically described college-, bachelor- or masters-level programs in educational studies were extracted and tallied (see Table 8).

Table 8

Participants by level of formal pedagogical training

Education-related Credential	Total Responses[a]	Total Representation	Relative Representation
None	127	74.71%	
Certificate/Diploma	6	3.53%	13.04%
Bachelor	26	15.29%	56.50%
Master	13	7.64%	28.30%
Doctorate	1	0.58%	2.17%

Notes: [a] n=170

As anticipated based on the review of the literature in Chapter 2, only 46 (26.6%) of the study's 172 participants have had formal training in pedagogy. Of those with formal training in education, 56.5% attained a professional undergraduate degree (BEd), and several respondents indicated that they continue to hold a valid provincial teaching licence. A smaller proportion (28.3%) of respondents have completed a graduate degree in education. Although these were overwhelmingly Master of Education (MEd) degrees, a small handful of related degree areas, such as Master of Museum Education and Environmental Communication, were also cited. Participant descriptions of Certificate/Diploma level teacher training included both grandfathered teacher certifications (Diploma in Education) and private instructor training programs.

4.1.3 Summary. This section explored the demographic background of participants in terms of their museum setting, age, level of experience as a museum educator, and their educational background. The sample consisted of 172 Canadian museum educators working across all areas of the museum sector, with strong representation from educators working with Historical Sites/Properties and Human/Natural/Industrial Museums. Participants also represented educators at all stages of their career, from young professionals to those approaching retirement. The similar demographic breakdown of participants in terms of their age and total years of experience in an educational role suggests that many educators may be transitioning into teaching roles from other areas of museum practice while still early in their career.

In terms of educational background, participants hold a range of academic and non-academic credentials. Most have undergraduate degrees, and although History and Art History counted among the most popular areas of degree focus, participants hailed from a wide variety of science and liberal arts disciplines. Professional credentials from national museum associations in Canada and the USA were also a common non-academic educational foundation for participants. Post-hoc analyses confirm that most practising museum educators today do not have any formal training in pedagogy. This said, one in four participants did complete some training in this area, the most common form being a professional Bachelor of Education degree.

Based on the demographic characteristics described in this section, we can confirm that the sample provides broad representation of Canadian museum educators working across the museum sector and at various stages in their career. The influence of age, level of experience, and educational background factors in shaping the professional development patterns of Canadian museum educators is explored in detail in the following section.

4.2 Correlational Analysis

The aim of this study was to understand the extent to which perceptions of personal investment contribute to participation among Canadian museum educators in various types of professional development. To begin addressing this issue, an online survey was created to measure the degree to which perceived levels of personal cost and benefit can predict individuals' participation in 11 forms of professional learning (research sub-question S1). Additionally, the survey permitted an exploration of the degree to which age, years in practice, and formal education may alternatively contribute to participation decisions for those activities (research sub-question S2). This section describes the findings of the statistical analyses of the survey data as they relate to these two research questions.

The online survey asked participants to indicate the frequency of their participation in 11 formal and informal professional learning activities, any employer support they received for participating in each activity, and the level of personal cost and benefit they experienced by participating in each activity. Seven personal cost and benefit factors were measured: time costs, financial costs, personal energy costs, skill development benefits, job advancement/security benefits, satisfaction of personal interest, and enjoyment of the learning format. Each of these factors was measured on a four-point scale (1=none, 2=low, 3=medium, 4=high). In addition, professional development activities were grouped into four categories based on the predominant learning interaction promoted or enabled by the activity. That is, whether the activity focussed primarily on peer learning, introspective learning, learning through one's students, or learning directly from material resources (see

Table 9). Full definitions for each activity and category are included in Appendix B.

Table 9

Professional development categories and activities

Predominant Interaction	Professional Development Activity
Learning from Peers	Conferences and Courses
	Informal Groups
	Membership-based Groups
	Mentorship
Learning through Introspection	Self-Reflection
	Self-Assessment
Learning from Students	Post-event Feedback
	Praxis
Learning from Content Resources	Self Study
	Professional Reading/Viewing/Listening
	Self-guided Explorations

This section begins with an overview of the frequency of museum educator participation in each of the 11 professional development activities. Next, participant perceptions of the costs and benefits associated with each activity and the prevalence of employer support for those activities are discussed. The remainder of the section details the results of the correlational and linear regression analyses which compared participation rates for each activity with the availability of employer support and perceptions of personal costs/benefits (S1), and with the museum educator's age, experience, and educational background (S2). Summary tables for each analysis are included, and significant correlations are highlighted.

4.2.1 Participation rates. To understand the professional development habits of Canadian museum educators, survey participants were asked to indicate how often they took part in each of the 11 types of professional development. Table 10 illustrates the engagement levels of participants in terms of their frequency of participation in each professional learning activity.

Table 10

Participation rates by activity type

Activity	n	Never	>1/mo.	1-3mo.	4-6mo.	6-12mo.	<1/yr.
Conference/Courses	151	5	6	13	21	61	45
Informal Groups	153	11	49	22	21	31	19
Member. Groups	150	28	19	24	17	36	26
Mentorship	150	53	20	7	14	21	35
Self-Reflection	139	20	49	12	18	16	24
Self-Assessment	138	63	12	10	6	20	27
Feedback	134	5	52	33	14	21	9
Praxis	135	20	30	24	16	28	17
Self-Study/Online	132	22	9	16	24	25	36
Prof. Read./View.	132	10	44	30	24	11	13
Self-Guided Expl.	131	12	29	23	26	21	20

Study participants indicated having engaged, on average, at least once in the past in roughly nine of the eleven professional development formats included in the study. The frequency of their collective participation in each activity, however, was highly variable. The activity undertaken most often was Visitor Feedback, with 38.81% (n=52) of respondents pursuing this form of professional development once or more per month. Participation in

Informal Groups, such as peer networking meet-ups and online social networks, was also found to be very common, with 32.03% (n=49) of participants engaging in these activities at least monthly. Deliberate self-reflection, professional reading, and self-guided research projects also counted among the most frequently pursued activities. By contrast, only 3.97 (n=6) of participants engaged in Conferences and Courses, and only 6.82% (n=9) participated in Self-Study/Online Study with the same frequency.

It is notable that the most frequently pursued activities tend to be ongoing in nature. Professional development events which are more episodic, such as Conferences and Courses, do not have the benefit of being constantly available and are therefore likely to exhibit much different participation patterns simply due to how often these events are held. Thus, measuring participation in terms of frequency alone does not offer a fair comparison across all types of activities. By considering participation and non-participation in absolute terms, however, the learning landscapes of museum educators becomes clearer. In absolute terms, 96.27% of participants consider visitor feedback for professional learning purposes, while 96.69% of participants take courses or attend conferences. Informal Groups also continues to rank highly in absolute terms, with 92.81% of participants engaging with these types of groups throughout the year.

Furthermore, upon considering the relative and absolute participation rates for a given activity, more nuanced patterns emerged. For example, only 81.33% of study participants belong to a Membership-based Group, such as a professional association. However, roughly one in three of those that do choose to become members actively interact with the group and/or its resources no less than once every 12 weeks, and more than half interact once or less per year. Approximately one in six interact once every 4-6 months. Unfortunately, a full discussion of

exactly why this pattern might exist for associations and similar groups is beyond the scope of this thesis. However, by revealing that specific engagement patterns exist for each type of professional development activity, this study offers data that program designers and administrators, such as those working within professional associations, may find useful when making evidence-informed decisions regarding the marketing and variety of their educational programming.

Overall, survey responses revealed that museum educators use a variety of formats for professional learning. Not all museum educators pursue every learning format, and not all learning activities are equally popular. Uptake rates amongst study participants ranged from just over half (54.35%) doing Self-Assessments to the majority of participants (96.69%) attending Conferences and Courses. These participation rates will be revisited in Chapter 6: Comparative Analysis and Discussion, and interpreted in light of the perceived levels of personal investment that participants feel each activity demands, and the availability of employer supports for those activities, which are the foci of the following two sections, respectively.

4.2.2 Perceptions of cost and benefit. To understand why museum educators might choose to pursue a particular learning activity it is important to recognize that decision making is a highly personal undertaking in which objective details are considered in light of subjective and situational considerations. A course that is offered at $300 may be perceived as inexpensive by a museum educator whose financial situation is established and secure, while another museum educator whose financial situation is less stable may consider the same course to be prohibitively expensive. Similarly, personal expectations and social precedents regarding what is considered acceptable in terms of price and features for a given activity can have an impact on how it is received by its target audience. Thus, a conference offered at $300 might be viewed as

reasonably priced, while a book that offers a similar scope and level of expertise for the same price would often be considered unrealistic. To ascertain the general preconceptions that museum educators have for various learning formats, the survey asked study participants to rate each professional development activity along seven dimensions of personal investment: Financial Costs, Time Costs, Personal Energy Costs, Skill Development Benefits, Job Security/Advancement Benefits, Satisfaction of Personal Interest Benefits and Enjoyment of the Learning Format Benefits. As briefly mentioned earlier, each dimension was measured using a four-point scale ranging from 1 (none) to 4 (high). This section discusses the levels of investment that participants indicated for each factor of the professional development activities included in the study.

Table 11 summarizes the median scores of the personal investment factors for each of the professional development activities studied. What is most immediately noticeable from the table is that scores of 1 and 2, which indicate a perception of no or low personal resource demand, only appear under Financial Costs. In fact, Financial Costs rated lowest as a barrier of all three of the cost factors measured. Time Costs and Personal Energy Costs both rated significantly higher across activities: the median of median scores for both Time Costs and Energy Costs is 3 (medium resource demands), while the median of median scores for Financial Costs is 2 (low resource demands). In other words, participants generally consider the time and energy demands related to ongoing learning to be greater personal expenses than price. This idea will be revisited as it relates to participation decisions in detail in Chapter 6: Comparative Analysis and Discussion.

Table 11

Perceived levels of cost and benefit

	Costs			Benefits			
Activity	Finance	Time	Energy	Skill dev.	Job adv.	Interest	Enjoy format
Conference/Courses	2	3	3	4	3	4	4
Informal Groups	2	3	3	3	2	3	3
Member. Groups	2	3	3	3	2	3	3
Mentorship	2	4	4	4	3	4	4
Self-Reflection	1	3	3*	4	2	3	3
Self-Assessment	1	4	4	3	2	3	3
Post. Feedback	1	3	3	3	2	3	3
Praxis	1*	4	4	4	2	4	3
Self-Study/Online	2	4	3	3	2	3	3
Prof. Read./View.	2	3	3	3	2	3	4
Self-Guided Expl.	2	3	3	3	2	3	3

Notes: 1 = None, 2 = Low, 3 = Medium, 4 = High. * multiple modes exist, lowest is listed.

With regard to benefit factors, none of the activities received median scores of 1 (no resource gains). In other words, participants felt that they could realize personal benefits from participating in each of the activities. Looking at the median of medians for each of the four benefit factors, Job Security/Advancement received the lowest aggregated rating, at 2 (low resource gain), while all other benefit factors received aggregated ratings of 3 (medium resource gain).

Conferences and Courses, Membership-based groups, Self-Reflection, and Praxis were all felt to offer one or more areas of high potential gain. In fact, Conferences and Courses

received the highest overall benefit ratings of all professional development formats, followed by Self-study/Online and Self-Guided Explorations. All other activities were felt to offer moderate benefits overall. Finally, it is notable that Membership-based groups, Mentorship, and Praxis all received high ratings for both costs and benefits.

The above analysis reveals that museum educators envision distinct patterns of cost and benefit for each form of professional development. Participants generally considered price-points to be reasonable, though the potential loss of time or energy was felt to be a greater cost associated with many of the activities. Participants also indicated that they find many of the learning activities to be highly enjoyable and hold strong potential for helping them to address their professional skill needs or interests. The availability of employer supports for each form of professional development is the focus of the next section.

4.2.3 Employer support. Technically neither a personal benefit nor a personal cost, Employer Support is an environmental factor which can increase exposure to potential activities or lower barriers to participation. The role of museum employers in promoting staff learning is a special case with potentially significant impact on the professional development patterns of museum educators. This section details the types of employer support structures that participants indicated being available to them for each professional development activity.

The online survey asked participants to indicate the types of employer support that they had available to them for each form of professional development. Participants were presented with five options and permitted to select as many as were applicable to their situation:

1. No, my employer does not provide any support for participating in this type of activity

2. Yes, by offering financial assistance or schedule accommodation for me to participate in this type of activity organized outside the institution
3. Yes, by permitting the use of facility resources in order for the education team to organize this activity directly
4. Yes, by formally organizing this type of activity specifically for the benefit of staff
5. Yes, by encouraging participation in this type of activity organized as primarily public programming

A final, open-text option was also provided to allow participants to describe any other forms of support that did not fall within the other options. Relatively few participants took advantage of the open-text option. However, a small number of participants indicated that as self-employed consultants this question did not apply to their personal situation. Other individuals commented that they were unaware of what supports their museum offers for staff development, and three participants noted that they participate in a particular activity out of a sense of professional responsibility, regardless of any employer supports they had indicated.

Roughly two-thirds of museums were found to offer formal support for the ongoing learning of their educators (see Table 12). Further, many participants indicated that their museum offered multiple types of assistance for a given activity. The most common form of employer support was found to be Financial and/or Schedule Accommodation. This benefit was often restricted to attending Conferences and Courses (73.05%), though many museums (44.29%) also extend this benefit to cover Membership-based Groups such as professional associations. Whether the latter was limited to membership fee subsidies or for attending association events is not clear. The least frequently supported activities in terms of Financial/Schedule Accommodation were Self-Assessment, Self-Reflection, and Mentorship.

Table 12

Prevalence of employer supports

Activity	n	None	Fin./Sched. Accom.	Facility Resources	Org. on Behalf	Public Program
Conference/Course	152	13	110	57	39	41
Informal Groups	153	58	46	34	10	35
Mbr. Groups	151	50	64	31	16	27
Mentorship	150	68	31	31	18	19
Self-Reflection	138	68	25	34	14	NA
Self-Assessment	139	69	15	27	17	NA
Post-Event Feedback	134	20	37	52	54	NA
Praxis	135	32	33	51	33	NA
Self-Study/Online	134	40	56	36	20	21
Prof. Reading	132	44	43	45	14	22
Self-Guided Expl.	131	40	39	41	15	24

As well, many museums support the ongoing learning needs of their educators by allowing the use of facility resources, such as meeting space or technological equipment. The activities most commonly supported in this way were Post-Event Feedback (37.90%) and Praxis (37.60%). Some participants noted through open-text comments that facility support for Post-Event Feedback was comprised of an institutional visitor feedback program that included templated response forms. Conferences and Courses (34.75%), Professional Reading/Viewing (34.43%) and Self-Directed Investigations (31.40%) also counted among the most commonly supported activities for which facility resources were available.

Museums are also supporting the professional development of their educators by encouraging them to take advantage of its public programs, such as guest lectures. Conferences and Courses was found to be strongly supported in this way (27.66%).

The least common type of institutional support was museums organizing programs on behalf of their staff. Support of this type ranged from 5.59% for Informal Groups to 41.94% for Post-Event Feedback. Other activities most commonly supported in this way include Conferences and Courses (24.82%) and Praxis (25.60%). Given the highly individual nature of praxis, this rate of support was unanticipated, and it is not clear from this study how museums are formalizing this practice.

Overall, the most widely supported professional development activities by employers are Conferences and Courses (90.78%) and Post-Event Feedback (85.48%). Membership-based Groups, Self-Assessment, and Self-Reflection are the activities least supported by museum employers. Notably, Self-Assessment and Self-Reflection comprise the entirety of the Teacher-Self Interaction category.

Museum employers offer a range of supports to facilitate the continued professional development of their educators. The most common form of support is through financial assistance or schedule accommodation, though permitting educators to take advantage of the facility's existing resources and public programming are also common ways that museums are encouraging staff development. The degree to which these supports may be contributing to the museum educator participation rates that were discussed earlier in the chapter is the focus of the next section.

4.2.4 Personal investment and employer support as predictors of participation. The discussion thus far has focussed on the professional development activities that museum

educators commonly participate in, their perceptions of the costs and benefits associated with those activities, and the various types of support that museum employers offer related to those activities. Scrutiny of these individual factors for possible relationships provides glimpses into how the professional development habits of museum educators form and the factors that most strongly influence participation decisions. This section will address the results of the statistical analyses related to research sub-question S1 (“To what degree can perceptions of personal cost and benefit be used to predict museum educators' participation in professional development activities?”).

To determine whether relationships exist between museum educator participation, perceptions of personal investment, and employer support, linear correlational statistics were calculated on the data. As previously discussed, engagement frequency is often influenced by the nature of the activity itself. To minimize this bias in the data, the absolute value for participation was used for this analysis. As well, since participants often indicated having multiple types of employer support available for a given activity it is difficult to ascertain which type may have been most influential in their decision to participate. Thus, the absolute value for employer support was applied. Consequently, the correlations described in this section do not reflect relationships between how frequently individuals undertook an activity, or which type(s) of employer support that may have been available to them. Rather, correlations reflect only whether participation occurred and whether any employer support for that activity was available.

In the proposal for this study, I anticipated that cost-related investment factors would result in mildly negative correlations with participation, while benefit-related factors and employer support would result in mildly positive correlations with participation. Due to the

mixed nature of the study data, Spearman's rho (r) was used for calculating the correlations described in this section (see Table 13).

Table 13

Participation, personal investment, and employer support correlations[a]

Activity	Fin.	Time	Energy	Skill dev.	Job adv.	Interest	Enjoy format	Empl. support
Conf./Course	*-.204	.072	.052	-.001	.033	-.089	-.008	†.211
Inf. Groups	†.246	.040	-.038	†.241	.026	‡.345	†.274	.096
Mbr. Groups	†-.270	-.002	.081	.027	-.057	.044	.095	‡.475
Mentorship	-.113	-.046	.006	.096	-.035	.035	.089	‡.490
Self-Refl.	*-.212	-.156	.028	‡.304	*.189	*.201	.151	†.271
Self-Assess.	-.098	-.031	-.084	.058	†.290	†.241	‡.301	‡.562
Feedback	.115	-.037	.064	.077	.085	.101	.006	‡.392
Praxis	.090	.047	.062	.114	.067	*.185	*.190	‡.466
Self-Study	-.137	-.083	-.106	.110	-.051	.157	*.178	‡.296
Reading	.076	.007	.002	†.236	.089	†.224	‡.332	‡.373
Self. Expl.	*-.210	-.022	-.027	.078	-.076	.121	.107	†.253

Notes: [a] Spearman's r. * $p \leq 0.05$; † $p \leq 0.01$; ‡ $p \leq 0.001$.

4.2.4.1 Cost factors. Financial factors appear to be a significant consideration only for some activities. Correlations between participation and financial costs are generally low, with Spearman's r ranging from -.204 for Conferences and Courses to .246 for Informal Groups. The negative correlations under Conferences and Courses, Membership-based Groups and Self-Guided Explorations suggest that money is a barrier to these activities. Although most of the correlations in this category are negative, this is not universally the case. The generally low

financial commitment of Informal Groups is reflected in a positive correlation with participation. Time and Personal Energy considerations do not appear to influence participation on their own, as no statistically significant correlations for these factors were found. We will explore the potential implications of these findings in greater detail in Chapter 6: Comparative Analysis and Discussion.

4.2.4.2 Benefit factors. Several positive correlations were found between participation and personal benefit factors. With regard to Skill Development, significant relationships were noted for only three of the eleven activities. This relationship was strongest for Self-reflection (r_s=.304), though more limited positive relationships were also found for Informal Groups (r_s=.241) and Professional Reading/Viewing (r_s=.236). While these activities certainly offer individuals the opportunity to expand their knowledge or self-awareness and increase their exposure to new ideas, they are not typically considered skills-focussed activities. It is similarly notable that the activities that are more traditionally used for skills development, such as courses and mentorship, did not demonstrate any statistically significant correlations.

Evidence of correlation between participation and Job Security/Advancement was limited to the two activities that comprise the introspective learning category (i.e., Teacher-Self): Self-reflection (r_s=.189) and Self-assessment (r_s=.290). These activities were also among the least supported activities by employers. Further, Self-Assessment was found to be the least popular professional development format, with nearly half of participants indicating they never undertake this type of activity. Considering the limited recognition offered by employers, the possible role of these activities in supporting job security is not entirely clear. We will explore one potential explanation for this statistic in our analysis of the qualitative interviews in Chapter 5: Qualitative Results.

Satisfaction of Personal Interest appears to be a consideration for participating in several activities. Moderate correlation was found for Informal Groups (r_s=.345), and low correlation was found for Self-Reflection (r_s=.201), Self-assessment (r_s=.241), Praxis (r_s=.185), and Professional Reading/Viewing (r_s=.224). Finally, Enjoyment of the Learning Format appears to be a contributing factor in participation decisions for several of the same activities as personal interest. Moderate correlations were found for Professional Reading/Viewing (r_s=.332) and Self-Assessment (r_s=.301), while low correlations were found for Informal Groups (r_s=.274), Praxis (r_s=.190), and Self-study/Online (r_s=.178).

4.2.4.3. Employer support. Most activities exhibited a low to moderate level of positive correlation between museum educator participation and the availability of employer support. These relationships were strongest for Self-Assessment (r_s=.562), Mentorship (r_s=.490), Membership-based Groups (r_s=.475) and Praxis (r_s=.466). Informal Groups was the only activity for which a significant correlation with employer support was not found. Since informal communities often develop away from the workplace and often with minimal direct costs to participants, this finding is, perhaps, not surprising.

4.2.4.4 Cumulative effects across factors for predicting participation. It is possible that personal investment factors and employer support may be acting to support one another to create stronger combined influences on participation decisions. To test this idea, linear regression models were created using absolute participation as the dependent variable, and the cost/benefit personal investment factors and (absolute) employer support as the independent variables. To identify the factors that had the strongest influence on the greatest proportion of participants, backward regression modelling was used. Table 14 lists the model for each activity which accounted for the variance in participation for the greatest percentage of participants.

Table 14

Participation, personal investment, and employer support regressions

Activity	b	F	T	E	SD	JA	I	EF	Emp	r[a]	adj r²
Conf./ Course	.444	-.237	.172		.331	.149		-.170	.758	.418	.135
Inf. Groups	1.530	-.302	.377	-.495		-.240	.361	.604		.455	.171
Mbr. Groups	1.898	-.446					.305		.908	.481	.213
Mentor-ship	-.186		-.641	.361	.657				1.143	.481	.205
Self-Refl.	-.290	-.301	-.175		.613	.218	.587		.341	.593	.320
Self-Assess.	-.517	-.413		-.186	.259	.204		.542	1.305	.594	.314
Feed-back	1.166		-.175				.666		1.049	.435	.170
Praxis	-.394	-.217		.324	-.522		.840	.286	.930	.489	.198
Self-Study	-.607	-.169				-.167	.598	.344	.703	.480	.197
Read.	-.720		.273	-.342	.369	-.323		1.078	.527	.580	.302
Self. Expl.	.828	-.376	.649	-.688				.876	.281	.462	.178

Notes: F = Financial costs; T = Time costs; E = Energy costs; SD = Skill Development benefits; JA = Job Security/Advancement benefits; I = Satisfaction of Personal Interest benefits; EF = Enjoyment of Format benefits; Emp = Employer support. [a] F Sig. = $p<.001$ (for all models).

As mentioned earlier, it was anticipated that cost-related factors would result in moderate negative relationships with participation, while benefit-related factors and employer support would result in positive relationships with participation. Such relationships would be reflected in either a negative or positive integer, respectively, in the resulting regression models. As we can

see from Table 14 this did not turn out to be universally the case. Many factors were found to have mixed influence, swaying participation decisions positively or negatively depending on the specific activity.

With regard to personal cost factors, Finance and Time influenced decisions for the greatest number of professional development activities. As anticipated, the influence was invariably negative for financial considerations. However, the influence of time was more variable: Conferences and Courses, Informal Groups, Professional Reading/Viewing, and Self-guided Explorations were all found to be positively influenced by time requirements. Energy also held a mixed influence on participation. However, whenever both Time and Energy were present in a model, the polarity of their influences was always opposite to one another.

With regard to personal benefit factors, Enjoyment of the Format influenced decisions in seven of the eleven best-fit models. Satisfaction of Personal Interest and Job Security/ Advancement held influence in six models. As hypothesized, their influences were largely positive. Notable exceptions to this were a negative influence for Job Security/Advancement with regard to Informal Groups, and a negative influence for Enjoyment of Format for Conferences and Courses.

Employer Support was found to have the largest influence on participation, both in terms of its overall positive weight in the generated regression formulae, as well as in terms of its presence within ten of the eleven models.

The calculated regression models in Table 14 explain the variation in activity uptake for between 13 and 32% of study participants. The model for Conferences and Courses had the least predictive strength, though it is still noteworthy for being able to account for 13.5% of the

variance in participation. The models with the greatest predictive strength included Self-Reflection, Self-assessment, and Professional Reading/Viewing.

Overall, Employer Support and Finance were found to influence participation decisions for the largest number of activities. Time and Enjoyment of Format also influenced participation decisions in several of the models. Energy, Skill Development, Job Security/Advancement, and Interest in the Format were present in the fewest models. Across all models, the relationships between factors were found to be more often positive than negative (35 positive influences; 20 negative influences).

4.2.5 Age, experience, and educational background as predictors of participation. To ascertain whether museum educators' age, experience, or educational background may impact their participation decisions, participation was checked for relationships between these factors. This section describes the results of the correlational and regression analyses which address the research question S2 ("To what degree can measures of age, formal education level, and years in practice be used to predict the types of professional development activities museum educators are likely to participate in?").

To determine whether relationships exist between museum educator participation, age, years of experience, and educational background, linear correlational statistics were calculated on the data. As previously discussed, engagement frequency is often influenced by the nature of the activity itself. To minimize this bias in the data, the absolute value for participation was used for this analysis. In the proposal for this study, it was anticipated that each of these factors would result in mildly negative correlations with participation with more formal activities and mildly positive correlations with more informal activities. Due to the mixed nature of the study data, Spearman's r was used for calculating the correlations described in this section (see Table 15).

Table 15

Age, experience, and educational background correlations[a]

Activity	Age	Exper.	Dip.	Bachelor	Master	Doctor	P. Cert.	Other	Pedag.
Conf./ Course	-.085	-.098	-.116	-.005	-.074	.082	-.033	.039	.103
Inf. Groups	-.026	-.057	*-.170	.112	-.082	.058	.103	.006	.011
Mbr. Groups	-.010	-.025	*-.169	.017	-.129	.129	.154	-.018	.158
Mentor-ship	-.065	-.106	-.134	.033	†.218	.106	-.157	-.081	.262
Self-Refl.	-.134	*-.181	-.113	-.031	-.086	.037	-.007	*.200	.052
Self-Assess.	-.076	-.068	.023	.021	*-.197	.027	.134	-.008	-.101
Feed-back	-.108	-.062	-.046	-.082	-.138	-.018	-.049	.059	.291
Praxis	*-.200	-.145	*-.181	.028	-.002	.032	-.026	-.053	.106
Self-Study	-.029	-.032	†-.237	-.060	-.106	-.016	.050	.106	-.051
Reading	-.128	-.120	.035	.126	.086	-.040	-.024	.094	.030
Self. Expl.	*-.175	‡-.300	-.084	-.037	.028	-.073	.054	.016	.209

Notes: [a] Spearman's r. * $p \leq 0.05$; † $p \leq 0.01$; ‡ $p \leq 0.001$.

Analysis revealed two low but statistically significant correlations between participation and museum educator age: Praxis (r_s=-.200) and Self-guided Explorations (r_s=-.175). Years of Experience proved to have a low level of correlation with participation for Self-Reflection (r_s=-.181), and a moderate level of correlation for Self-Guided Explorations (r_s=-300).

Relatively few correlations were found to exist between educational attainment and participation. These relationships were low and generally appeared for individuals who hold diplomas, though some relationships were also evident for educators who hold master's degrees. Diploma holders were less likely to participate in Informal Groups (r_s=-.170), Membership-based Groups (r_s=-.169), and Praxis (r_s=-.181) than non-diploma holders, though the same could not be said for educators with other educational backgrounds. Master's degree holders were found to be more likely to engage in Mentorship relationships (r_s=.218) and less likely to pursue Self-Assessment (r_s=-.197) than their peers. No statistically significant relationships were found for individuals who hold bachelor's degrees, doctorates, or professional certifications.

To determine whether formal knowledge of pedagogy affected participation or activity preferences, the relationship between holding an education credential and participation was also tested. This analysis resulted in no statistically significant correlations.

This analysis revealed limited relationships between educator age, experience level and educational attainment on professional development activity selection. This finding was not anticipated and provides limited support for the findings of Richter et al. (2011), whose study of German school teachers demonstrated a bias toward social learning both at the beginning and toward the end of one's career.

4.2.5.1 Cumulative effects across factors for predicting participation. As we have seen, participant age, years of experience and educational background on their own have limited influence on participation decisions. However, it is possible that the impact of these factors is simply subtle, detectable only through their combined influence. To determine whether these factors have any cumulative effects on museum educator participation patterns, backward linear regression models were calculated using absolute participation as the dependent variable, and

participant age, experience, and educational background as the independent variables. Table 16 lists the derived linear regression models.

Table 16

Age, experience, and educational background regressions

Activity	b	Age	Experience	Education	r	adj. r^2	F sig
Conf./ Course	1.029	-.020			.130	.010	.138
Inf. Groups	.919	.015	.001	-.019	.072	-.016	.505
Mbr. Groups	.957	-.043	-.006	.034	.051	-.019	.650
Mentor-ship	.478		.064		.163	.019	.106
Self-Refl.	.833	.025	.010	-.038	.111	-.011	.503
Self-Assess.	.700		-.049		.119	.006	.193
Feed-back	1.036	-.024	-.011	.012	.118	-.010	.437
Praxis	.828		.045	-.047	.277	.036	.023
Self-Study	.946	-.043			.123	.007	.215
Read.	.910		.021	-.021	.135	.002	.270
Self. Expl.	.833		0.024		.101	.002	.454

Overall, regression analyses revealed very limited cumulative effects between age, experience, and educational background. Praxis was the only activity for which the derived

regression model passed a goodness of fit test. This said, its resulting model only accounted for 3.6% of the variance in participation and is thus of very limited practical use.

4.3 Summary

The results of the statistical analyses of 172 museum educator responses to the online survey provide evidence of a profession that is active when it comes to pursuing ongoing learning. Participants often indicated having participated in multiple types of professional development within the past year. The most commonly pursued professional development formats for these educators were Conferences and Courses, Post-visit Feedback, Informal Groups, Professional Reading/Viewing, and Self-Guided Explorations. The least commonly pursued activities, by contrast, were Mentorship and Self-Assessment. Furthermore, analysis revealed that participants hold distinct perceptions of personal investment for each type of activity. Financial considerations were found to be less demanding of personal resources overall than the time and energy needed to participate. However, Time and Energy costs were not found to have any statistically significant correlations with participation in any activity on their own. Linear regression modelling revealed that when costs and benefit factors were considered simultaneously for their potential combined impact on participation decisions, time and finances were strong considerations for participation in several activities. In terms of benefits, Job Security/Advancement was not found to be a significant motivator to participation. Rather, participation was more often related to personal interest and enjoyment than to job-related benefits. This said, in both single correlations and multiple factor regressions, Employer Support was found to have a strong relationship with participation in several of the activities. Many museum employers were described as offering a range of benefits and internal structures to support the ongoing learning needs of their educators. This was most often in the form of

financial assistance or schedule accommodation. Participant responses further suggested that often these benefits selectively covered only specific types of professional development, notably conferences, courses, and professional memberships.

These analyses partially support the original hypothesis for research sub-question S1 insofar that generally negative low-to-mid level correlations were found for Financial Costs and Employer Support, while general positive low-to-mid level correlations for three of the four benefit factors were found for many activities. However, Time Cost, Energy Cost, and Job Security/Advancement Benefit were not found to play a significant role in participation decisions for many of the activities. Results did not support the original hypothesis for research sub-question S2, in that participant age, experience level, and educational background were found to have negligible impacts on professional development participation.

Research sub-question S3 is addressed in the next chapter, which details the findings of the qualitative analysis of the semi-structured interview component of the study.

Chapter V

Qualitative Results

This chapter will recount the findings of the phenomenological analysis of the qualitative interview data used to address research sub-question S3 ("How do museum educators feel their participation in professional development activities contributes to their professional growth as educators?"). This chapter includes three sections. The first section outlines the interview cohort and briefly describes each participant in terms of their professional background and work setting. The second section summarizes the collective experiences of the participants as they relate to the professional development activities and employer supports examined in the online survey. The third and final section discusses the professional development activities that participants undertook which were not included in the survey, as well as the attitudinal factors which influenced their professional development activity patterns.

Phenomenological studies compare the subjective understandings and lived experiences of a group of individuals to uncover the essential traits of a given phenomenon. As briefly mentioned in Chapter 3: Methodology, phenomenological research seeks to describe both "what" a group of individuals experience and "how" they experience it. Thus, for this study, the 11 activities from the survey provided a base for purposive coding in order to describe the activities that participants undertook to foster their professional growth ("what"), while open coding enabled the research team to uncover additional activities not covered in the survey ("what") and the more abstract and contextual aspects of their experiences ("how"). Within this chapter, these two levels of analysis have been synthesized and are presented as a series of brief narratives describing each of the professional development activity areas and experiential themes. Focus is placed on describing the types of professional development activities that participants undertook

or continue to undertake, and their recollections, sentiments, and personal reflections of the contextual factors they felt impacted their experience of those activities.

As detailed in section 3.3 (“Data Collection”), of Chapter 3: Methodology, all interview recordings were manually transcribed and each participant was required to review and approve the draft transcript of their interview to confirm its accuracy prior to beginning qualitative analysis.

To contextualize the participant experiences described later in this chapter, the next section will describe the demographic composition of the interview cohort, including brief biographical overviews of the six participants.

5.1 Participant Characteristics

As described in Chapter 3: Methodology, interview candidates were identified by a positive response to the survey question enquiring about their willingness to be interviewed. Candidates that responded in the affirmative to this question were considered further based on their responses to the survey questions relating to their work setting, age, and experience level. Regional details inferred from the contact telephone or email address provided voluntarily by participants, in response to the question about willingness to be interviewed, were also considered. This process ensured that the interviews and subsequent analyses represented a range of voices from across the career spectrum and museum sector. Based on these criteria, a total of six museum educators were selected for interview.

The six interview participants represented a range of early-, mid-, and late-career educators working across the museum sector, and across Canada. To retain participant anonymity, all names were changed and other personally identifying details removed in preparing this document. “Anne” is a young professional at a children’s museum in eastern

Canada. As one of the museum's Education Specialists, she interacts directly with the visiting children and their caregivers to facilitate meaningful experiences with the museum's exhibits and resources. "Beth" is a mid-career educator at a botanical garden in western Canada whose role includes training the garden's seasonal student and volunteer educator teams, as well as special projects management. "Charles" is an established educator who oversees educational program development and volunteer management at a planetarium in central Canada. "Dawn" is an informal educator whose current role includes presenting the live animal shows at an aquarium in Western Canada. "Erin is a mid-career artist and educator at a mid-sized art gallery in Eastern Canada. "Fran" is a late-career museum professional in charge of a small community museum in Atlantic Canada. As such, she describes visitor education as "only one of [her] many duties". Table 17 provides a summary of these participant details.

Table 17

Interview participant details

Name	Age	Sector	Experience as ME
"Anne"	>25	Children's Museum	<5 years
"Beth"	25-34	Botanical Garden	11-15 years
"Charles"	35-44	Science Museum & Planetarium	>20 years
"Dawn"	25-34	Aquarium	6-10 years
"Erin"	45-54	Art Gallery	11-15 years
"Fran"	55-64	Community Museum	11-15 years

Half of the participants fell within the mid-level range (11-15 years) for total experience as a museum educator, yet not all were mid-career in terms of age. As described in Chapter 2: Review of the Literature, Bamberger and Tal (2007) and others found that individuals often

come into museum educator roles through serendipity or circumstance, rather than as a pre-selected career goal. It appears that, indeed, this was the case for several of the interview participants. During the interviews, participants were asked to briefly describe their professional background. Charles recalled having just completed a degree in journalism when he landed upon a front-line interpreter position at the planetarium which allowed him to begin repaying his student loans. From there, his role expanded into education program development and team leadership. Erin, who holds a Fine Arts degree and continues to be a practising artist, held a part-time educator role in a smaller gallery before moving into her current role. Dawn presented travelling science shows to elementary school children before a cross-country move led her to seek out volunteer and part-time docent opportunities at a handful of museums in her new town. Volunteering provided Dawn the exposure and experience necessary to later seek out a paid educator position at the aquarium. In fact, several of the participants described similar histories of volunteering as docents within museums prior to becoming formal museum educators.

Each of the interview participants arrived at their career as a museum educator through different routes and unique personal circumstances. Despite their individual histories, the interviews revealed several common sentiments and experiences regarding their ongoing professional learning. In the next section, we will explore those narratives in detail.

5.2 Activity Themes

As described earlier, to understand how participants conceive their professional development and the factors that influence their participation decisions, coding of the interview transcripts was performed in two phases. The first phase, purposive coding, focussed on identifying the activities that participants undertook in the course of their ongoing professional

development and how those activities were being used to foster professional growth. This section focusses on the results of this initial, purposive coding phase.

Purposive coding centred on the 11 professional development activities and employer support areas that were previously investigated in the online survey. Participant comments were compared, and areas of commonality provided a basis for constructing the narratives of the collective experience for each professional development activity area that follow.

5.2.1 Conferences & courses. Traditionally structured formats such as professional conferences, short courses, and hands-on workshops appear to be a popular way for museum educators to stay up to date on practical topics and professional issues. Participants used attendance at conferences and courses to foster professional relationships, as well as for direct learning. Beth described these types of face-to-face events as "beneficial in both the learning aspect–a speaker or workshop is often applicable to the work I do–but also there's a lot of benefit in the networking and forming relationships with other people in the field." The scope of these activities varied widely among participants, who described both small peer-developed and large professionally organized programs as opportunities for them to connect and learn from one another. Conferences were appreciated for their ability to expose participants to a range of topics within a set amount of time, though Dawn commented that the value of attending depended on the learning level of each session ("Sometimes you attend conferences and there are one or two sessions that are great, but I find that with many interpretive conferences a lot of it is geared toward the new interpreters. Sometimes it's nice to have a reminder, but…"), an aspect which is not often included in event marketing materials.

Participants were generally aware of the limitations of the passive style of learning prevalent in conference- and course-types events. Fran commented that she "always loves to take

a workshop", despite feeling that the format is "lazy learning [since] someone just feeds it to you." Thus, it would seem that the convenience and familiarity of these formats can outweigh their drawbacks.

Finally, Dawn mentioned that "if someone goes to other facilities or goes to a conference they [must] prepare a presentation on what they observed and share that with the group". In fact, sharing new knowledge with colleagues after a conference or course via in-service presentations was mentioned by multiple participants as a way to increase the expertise of the team as a whole, while simultaneously helping the educator to reconfirm their own understanding of the topic.

5.2.2 Informal groups. Participating in open or casual peer groups appears to benefit museum educators in multiple ways. Aligning with peer groups allowed participants to reaffirm their sense of professional belonging, share their experiences with others, and access a range of perspectives whenever a professional issue presented itself. For Beth, participating in informal groups allowed her to develop "a nice network of people I can go to for advice or have a lot more people helping to solve the problem than just me." Charles felt that personally connecting with peer networks benefitted his museum employer by allowing him to share and discuss "successes and failures" with peers at other museums who have attempted similar programs, and then using that knowledge to "either improve our own programs or create new ones that in some cases may be based off ones [we discussed]."

The peer networks that participants described ranged from scheduled local meet ups, to engaging with an international community of peers through online platforms. In fact, the use of online communication vehicles and social media sites was noted by multiple participants. The original definition of informal groups used in the surveys encompassed online groups implicitly, however participant comments suggest that online tools have become a common means of

staying in touch with other museum educators today. The computer-mediated formats that participants regularly took advantage of ranged from following professional "blogs and web-based forums, [both] national and international" (Beth), to "following [email] list groups" (Fran). Due to the unregulated nature of these types of entities, however, Beth commented that successfully navigating online groups "takes skill – or maybe luck? – to find a platform that is informal but still trustworthy and educational". Overall, participants felt that the learning that occurred through their informal groups was complementary to, rather than a replacement for, engaging in more formal learning events.

5.2.3 Membership-based groups. Professional and industry associations offer a range of social and material resources that participants took advantage of for their ongoing learning. Access to a network of like-minded peers was particularly noted by Beth as a reason for joining an association. She recounted that "within [the association] there are lots of groupings of people that work in similar areas" and that "we would work together" to exchange knowledge. Dawn described using the association she belongs to as an important professional reference hub:

> "I oftentimes start with the resources that [my association] has provided. They have a book club and that's how I've heard about [a few books] I'm reading right now. So, it's finding those resources and reading them. [The association] also has the legacy magazine for interpretation. I tend to read that."

Indirect comments related to association-based professional certification programs suggest that these may also be attractive offerings for some museum educators. Finally, participating either as an attendee or as a presenter at association-based professional conferences was described by several of the participants. However, to avoid category blurring those experiences have been included within the Conferences and Courses activity described earlier.

5.2.4 Mentorship. Mentorship is considered a highly valuable and mutually rewarding professional development activity by several of the participants. Notably, their mentorship experiences were largely expressed as entailing lateral (peer) relationships rather than hierarchical ones. This stands in contrast with traditional mentorship models, such as apprenticeship, which pair expert practitioners with novices. Instead, participants described a variety of casual and formal mentorship activities, ranging from peer observation and in-service teaching, to one-on-one problem solving, to peer coaching programs. For Erin, “the easiest way to develop a new program is to go out and see how other people are doing it.” As such, her personal peer network played a key role in supporting her directed learning efforts. Meanwhile, Dawn regularly participated in her museum’s structured peer evaluation program, an activity she found to be “valuable” and “rewarding for both of us who participate in the process”. Thus, the idea of mentorship encompassed both goal-directed and network-oriented learning activities for participants.

5.2.5 Self-reflection. Self-reflection as a deliberate activity does not currently appear to be a prominent component of professional practice. The activities described by participants were generally unstructured and holistic in perspective, encompassing both conscious reflection and casual contemplation. Participants described previously reflecting on topics ranging from their personal role in contributing to their institution's mission (“[such as] what we as an organization or educator should be promoting”, Anne), to the impact of broad social trends on the museum sector as a whole (“for our organizations to not lose our relevance, it’s important that we are able to define ourselves as separate than just being able to google something, or look it up on Wikipedia or hear it on a TED talk”, Dawn). There was no self-disclosure that any of the participants were documenting their reflections, such as through journaling or blogging.

Although few participants directly mentioned their self-reflective activities, the tone of the conversation within several of the interviews suggests that many professionals are critically self-aware. It is possible that participants either did not feel their introspective activities were worth noting in the interview, or that they did not recognize this form of reflective practice as a professional development activity.

5.2.6 Self-assessment. Casually structured self-assessments were undertaken by multiple participants to help them identify knowledge gaps during the preparatory stages of program development. As such, this activity is often intimately tied to the processes and outcomes of educator self-reflection. Fran acknowledged that she is "not an expert in every field, so when we have a new exhibition I'll often have to do a considerable amount of reading to prepare myself about the new topic". For Erin, learning projects often begin by asking herself "what do I need to know?" and "who do I need to work with?". Originally considered within this study to be an exclusively solitary activity, the interviews revealed that this is not always the case. The formal peer evaluation program at the children's museum described by Anne (see Mentorship), for example, leverages the collective practice knowledge of the team and combines objective observation with personal reflection to help the educators envision the state of their practice at a specific point in time. As previously noted, this program was felt to be empowering and mutually beneficial for everyone involved.

5.2.7 Learner feedback. Feedback mechanisms were described by several participants as a way of staying abreast of how their teaching and program designs are being received by the public. The original definition of this activity centred on information received from visitors after a learning encounter. However, some participants described collecting feedback through non-participatory observation of visitors *in situ* with various exhibits to gauge whether encounters are

meeting visitor expectations and to expose areas for improvement. Charles described this form of feedback as particularly important in improving his practice:

> "You might look at what happened with Program A, and as you're developing Program B you say 'don't forget what they did in Program A because they're probably going to end up doing something similar' or they might also do something completely different as well, so it's…invigorating just to see…the different paths that [a program] can take and for me that is the most valuable learning that can happen."

Although direct feedback was preferred, Dawn commented that her role doesn't allow her much direct contact with visitors. Instead, "volunteers tend to be one-on-one with our visitors [so] they're able to report a little bit more on the nuance of how visitors see a particular exhibit or issues that our visitors face". As such, she often relies on second hand feedback via conversations with the docents for insight on which aspects of a program may require adjustment.

Overall, participants felt strongly that their interactions with visitors and docents offer constant opportunities for professional learning. This collective sentiment was best summed by Becky: "any time I'm out working with garden visitors, I feel like you have a learning moment. I tell my staff that there's not one day that I haven't learned something new."

5.2.8 Praxis. As we saw with learner feedback, interactions with visitors, volunteers and new staff offer constant opportunities for learning. Directed conversations with these individuals exposed participants to alternative perspectives that often challenged and expanded their established understandings and how they might adjust their teaching to maximize learner outcomes ("The questions and comments that come up very often change how we think about things", Fran; "[New staff] bring a new skillset and point of view to our programs [which] allows

us to adjust and update our interpretive programs every year to incorporate their various perspectives", Beth). Docents who are former school teachers played a particularly important role in this regard for multiple participants. Erin noted that working with retired teachers is one of the most valuable learning opportunities for her personally ("because I don't have a teaching degree so seeing that perspective has been very beneficial in kind of rethinking how we talk about art with different age groups and connecting with the curriculum and that sort of thing").

Since both Praxis and Learner Feedback use learner responses to refine the museum's programming, accurately differentiating these activities from the participant's comments was sometimes challenging during the coding process. Thus, for the purposes of analysis, praxis was taken by the research team to represent a more informal process of using feedback to directly adjust one's teaching techniques or philosophy. For example, Anne recalls "Coming in to this role…there was this viewpoint of ed programs needing to have an outcome and kids needing to be guided into that, but talking and interacting with them has completely changed that for me."

5.2.9 Self-study & online learning. Online learning among participants ranged from accessing content resources as a specific need arose to regularly participating in webinars. Participants described the accessibility and affordability of online learning as strong advantages contributing to their decision to participate in this form of learning. For example, Charles commented that he found webinars to be "a bit more convenient both in terms of being able to attend it and the cost of it as well". For Dawn, these advantages were particularly relevant, since "trying to get my company to pay for it or give the time is exceptionally difficult." The interviews did not reveal details surrounding the learning outcomes they experienced from their online learning endeavours, or whether participants also pursued any offline forms of self-study.

5.2.10 Professional reading, viewing, or listening. Participants regularly used formal and informal reading to help them remain up to date on research and practice. Although the value of reading was generally recognized by the participants, Charles commented "I find that [when I read] I retain less and less nowadays". In fact, multiple participants felt that academic texts were a particularly inefficient and mentally demanding format for learning. As a result, they tended to preferentially choose summaries, videos, or resources written in everyday language on the same topic in order to speed up their research. This said, the choice to use academic or more informal sources can depend on the specific outcomes required. Beth explained that although she will often refer to formal literature for generating project approval or justifying design decisions, "sometimes when you're just on your own trying to peruse a large volume of ideas, it's often a lot easier to do that through an informal site." Industry magazines, blogs and e-newsletters were mentioned as frequent reading sources for participants for learning about practice tips, industry news, and "just in time" information.

Additionally, not all professional reading was found to be directed. Some participants described learning serendipitously from online surfing or from unexpected articles received by email. For example, Dawn recounted that she regularly receives email articles from an industry vendor, and "though some of the content is [repetitive], it's also how I came across ways that some institutions are doing visitor-led learning without the use of a live interpreter…it's stuff like that."

Finally, reading was not described as being an end to itself. Rather, participants often saw their reading within a larger cycle of learning that also included subsequent peer discussion, teaching, or practice application. For Beth, professional reading was a way to "build a framework to justify what I want to do, or find what the research suggests to adjust my plans

accordingly to make it fit in with what current research says. Then I'll use that to leapfrog into creating the actual program based on that foundation." Similarly, Fran described that when she is preparing for a new exhibition "I make sure that I study the topic really well and that I'm prepared not just to discuss aspects of the exhibition with visitors, but also to pass that [information] on to our summer students so that they're comfortable interacting with the public." Dawn described this learning cycle most succinctly: "Directly reading about the thing, applying it for myself, then teaching the people around me."

5.2.11 Self-directed investigations. Self-motivation appears to be an essential component for success when participants were pursuing independent research projects. Independently gathering knowledge can involve consulting both online and human resources, and participants' peer networks often act as a jumping-off point for "by providing a lot of the background…answering the questions of 'what do I need to know?' and 'who do I need to work with?'" (Erin). Dawn similarly noted that she liked having the freedom to direct her learning path, and that "part of that includes finding the people who know about it and harassing them. Seeking it out for myself does still mean others, but in a way where I'm directing the conversation."

Visiting other museums was found to be a popular form of self-directed research for participants. This form of professional development was not anticipated or included within the original survey activity descriptions. However, five of the six participants commented that they appreciated visiting other museum sites for both leisure ("when I travel, I choose destinations where there are a lot of cultural opportunities and try to take advantage of those", Fran) and to see how others have tackled a challenging topic or programming issue. Charles found it was "a nice advantage being able to see other places". Erin suggested that by exploring unfamiliar

exhibitions she could "wear both the hat of the visitor and the educator", experiencing the exhibit or program as the visiting public might, while using her professional background to peer into the design elements to uncover novel strategies that she could then apply to her own projects.

5.2.12 Employer supports. Employer support was not directly investigated within the interviews. However, several participants offered comments which spoke to the ways in which their selection of professional development activities were impacted by resources available through their employer. To facilitate coding for this theme, the working definition of Employer Supports used by the research team was "the availability of organizational structures and programs that facilitate ongoing professional learning and development."

Participants described the availability of various types of employer support which impacted the ways in which they met their ongoing learning needs. Comments hinted that both the institution's resource limitations and organizational structure may be factors influencing the types of initiatives that the museum employers offered. Anne described the team structure at the children's museum as "very collaborative" and appreciated the opportunities for peer teaching and observation that were available ("when there is that opportunity for them to present or share knowledge I appreciate it and tend to find it valuable"). In-service programs such as these can be cost efficient for museums with limited human resource development budgets while also being "rewarding for [those] who participate" (Dawn).

The availability of supports for the purchase of material learning resources and for attending professional events also influenced some participants' activity patterns. Beth remarked that she's "lucky to work for a place that will pay for books, so I order lots of books to read". Similarly, Erin described often attending conferences and visiting other museums to discuss common issues, suggesting that the art gallery she works at supports her learning through

schedule flexibility, and potentially also through funding. She further mentioned that she would regularly economize by bundling two or more activities into one trip. By contrast, the absence of employer funding for professional development impacted the types of activities that Dawn elected to undertake. Since "trying to get my company to pay for [professional development] or give the time is exceptionally difficult" (Dawn), flexible, low-cost opportunities such as webinars were important in helping her stay up to date professionally.

5.2.13 Summary of purposive coding findings. The purposive coding phase was framed using the 11 activity categories and employment supports included in the online surveys. This phase allowed the research team to identify examples of each activity area, as well as the contextual factors surrounding the lived experience of those activities. The researchers found examples related to all 11 activity categories, though participants more often described participating in peer-oriented activities, such as conferences and networking groups. By contrast, participants made relatively few comments related to solo endeavours, such as Self-reflection and Self-study. Furthermore, the lived experiences related to several of the activity areas were found to extend beyond the original definitions used in the surveys. For example, participants frequently described visiting other museum sites both for enjoyment and as a form of professional research (Self-directed Investigations). Additionally, multiple participants discussed how they used computer mediated communication formats, such as blogs, listservs, and social media sites for professional learning (Informal Groups). One participant used non-participatory observational research to monitor visitor response to program elements and to refine their designs (Learner Feedback). Finally, the interviews confirmed that museum policies and support structures for staff learning can influence the types of activities that museum educators undertake.

As briefly mentioned earlier, in order to document any other activities that participants undertook in their pursuit of ongoing learning, as well as the contextual elements impacting on their ongoing learning habits in general, an open coding phase was also pursued. The next section describes the findings of that second phase of analysis.

5.3 Additional Activities and Themes

Upon completion of the purposive coding phase, open coding was performed to uncover any additional professional development activities that were not included in the online survey, as well as to enable the identification of more general, experiential themes related to participants' ongoing learning habits. To achieve this end, the research team re-reviewed participant comments without preconceptions or pre-specified concepts. Significant statements related to the subjective experience of professional development and to learning activities not previously documented were then compared and narrative summaries describing participants' collective experiences were constructed.

This open coding phase revealed one additional professional development activity (Peer Conversations), and one experiential theme (Approach). The Approach theme includes four individual concept codes describing the personal preferential and circumstantial factors that influenced the learning habits of participants: Convenience, Learning Mode, Mindset, and Selection. This section will review each of these codes in detail.

5.3.1 Peer conversations. Frequent interactions among colleagues are a vital component of participants' ongoing learning. The research team defined Peer Conversations as "casual conversation between colleagues or fellow educators within a project team". The sustained interpersonal contact that occurs within individual organizations and project teams tends to foster a level of familiarity with colleagues' personalities and projects. This familiarity can, in turn,

encourage ongoing exchanges of perspectives, ideas, and knowledge, and create a fertile environment for ongoing learning. As a result, these exchanges differ both qualitatively and quantitatively from other forms of peer learning and are thus considered to be a distinct form of teacher-teacher interaction.

The specific working culture of the organization appears to influence the variety and success of these learning opportunities. Anne described these exchanges at the children's museum as being often spontaneous:

> "There are other education specialists here and we all work very collaboratively together. So, although we may be in charge of different things, we're constantly talking and kind of feeding off of each other's ideas and I think that's a huge part of learning, getting to talk about what we're doing."

Erin, on the other hand, recalled these learning moments occurring within larger, more structured events: "the debriefings, the conversations that happen after each program is implemented, is the part where the learning for all of us, I think, happens the most."

Described as both "enjoyable" and "valuable" by participants, conversations with colleagues was the only form of teacher-teacher interaction mentioned by all six interviewees. Further, as a cost-free form of learning, peer conversations are an efficient way for museum educators to solve immediate problems and fill in informational gaps.

5.3.2 Approach. Open coding revealed one experiential theme. This theme, Approach, encompasses the attitudes and criteria that museum educators use to inform their professional development decisions. Four distinct concept codes comprise this theme: Convenience, Learning Mode, Mindset, and Selection. These four concepts are defined and illustrated below.

5.3.2.1 Convenience. The research team defined this code as "the individual's reasoning for selecting particular learning activities in terms of their type, frequency, or circumstance". It was not used to refer to how specific topic areas for learning were chosen (see Selection).

Efficiency and ease were crucial considerations for participants in pursuing professional learning. As such, direct discussions were a popular way to fast track local program development. As Anne described, "talking with people is just kind of natural". Erin used her network connections avoid "starting at zero" and instead "start mid-way through the project, building on [their] experience".

As discussed earlier, some participants found academic texts to be inefficient and energy draining as learning resources and as a result preferentially sought out more succinct formats such as summaries ("some academic papers can just exhaust you by page 2. So, I love bullet points or a paper that has just summed it up in layman-speak", Beth). Social media resources, video-based, and other learning formats were similarly seen as handy starting points for learning for reasons of convenience and expediency ("I've started to do a bit more with online conferencing. I find that to be a bit more convenient both in terms of being able to attend it and the cost of it as well", Charles).

Finally, finding opportunities to address multiple learning goals simultaneously and sharing one's personal research findings with peers were some of the strategies that participants adopted to make staying up to date professionally easier and more economical ("some of [the trip] was attending the conference formally, some of it was about setting up an independent meeting with various team members at another institution to see how they're doing it", Beth; "my peers will tend to investigate some knowledge or technique more than I do, so when there is that opportunity for them to present or share that knowledge I appreciate it", Dawn).

5.3.2.2 Learning mode. This code is defined as "the nature and reasoning behind an individual's chosen learning strategy (e.g. active, passive)". This code was not used to refer to specific IET interaction types.

Direct learning was generally felt to be a superior strategy for learning. This perspective tended to be reflected in how participants approached their teaching practice at their museum but was not always reflected in their own learning activities. For example, Fran described the active learning strategies she includes in her docent training program ("I'll take 3 hours to do an extended tour and then go back with them later on and ask them to give me a tour to see what they've retained and then give them more information at that time"), though she admitted that she preferred to take workshops for her own professional development, even though they were "lazy learning – someone just feeds it to you". Similarly, Charles commented that object-based teaching was common in science museums ("you don't show them how nitrogen can make ice cream, you make ice cream with them"), but mistakenly described the video-based activities he pursued for his own professional development as a direct form of learning. It was not apparent from the interviews whether participants were conscious of any discrepancies between their teaching philosophy and their personal learning activities.

Some participants pointed to personal learning style preferences or situational factors as reasons for choosing to pursue active or vicarious learning activities ("it could just be part of my personality", Charles; "I find that I learn a lot by seeing and experiencing things", Erin; "[my appreciation for] reading comes from my education background", Anne). Overall, active learning through discussion, experimentation, and peer teaching was more prevalent in the interviews than were passive or vicarious learning activities.

5.3.2.3 Mindset. The research team defined this code as "the individual's attitude, approach, or philosophy toward professional learning". It was not used to refer to specific learning strategies (see Learning Mode).

Participants generally saw learning as an organic and ongoing process. Multiple participants directly or indirectly described themselves as a lifelong learner, with several commenting that interactions with colleagues or visitors were also opportunities for personal learning ("I'm kind of one of those lifelong learners", Fran; "pretty much every experience I've had here I've learned from", Anne). Self-awareness and remaining open to these constant learning opportunities were key characteristics of these educators ("keeping in mind that you don't know everything is a really good skill to have and being open to the fact that you could learn something new today", Beth). A social, collaborative spirit and a desire to examine programs from multiple points of view were also common traits.

Participants often took a relaxed approach to their ongoing learning which allowed them to remain agile in addressing challenges as they arose. Further, by staying constantly abreast of best practices in museum learning and sharing their knowledge with peers, these educators were able to more quickly develop strong programs at their museums while also supporting advancement of the profession more generally.

5.3.2.4 Selection. The research team defined this code as "the individual's thought processes or considerations when determining specific learning topics". It was not used to refer to general activity types.

When it came to activity selection, topical content trumped format preferences to a certain degree. For participants, the decision to learn was often based on the realization of a need arising from a current project or issue, though learning purely for personal enrichment was also

mentioned (“I most like to seek out specific things based on what I don’t feel particularly strong in”, Dawn; “Besides my regular museum job, I also have a personal interest in heritage preservation and historic costuming. So, I also do a lot of personal enrichment in those areas”, Fran). The nature of the potential activity appeared to be of secondary concern to finding an activity or resource that the participant felt best allowed them to address the issue at hand. This said, informally reaching out to one's peers or professional network for preliminary guidance was a very common first step in addressing a knowledge gap (“whenever I have a problem with something that I’m doing with a program, or a staffing issue, I have a nice network of people I can go to for advice “, Beth). Rather than being a deliberate end point, however, peer consultation often acted as a spring-board for identifying additional topical resources for further learning.

5.3.3 Summary of open coding findings. Through the Approach theme, we see that participants held strong epistemological perspectives that defined their teaching approach but did not necessarily define how they approached their own learning (Learning Mode). When considering potential learning activities, personal accessibility was found to hold strong influence on their selection decisions (Convenience). Participants generally used professional development to address immediate job needs, rather than for the pursuit of formal knowledge or long-term career goals (Selection). There also appears to be a communal tendency within the profession that manifests itself in a keenness to foster close networks of peers with whom knowledge can be called upon and exchanged as needs arise (Mindset). The identification of an additional peer learning activity area related to informal workplace discussions (Peer Conversations) reinforces this finding. These ideas converge to reveal a generally pragmatic approach to professional learning.

5.4 Summary

Six individuals were chosen to participate in the telephone interview component of the study. These participants ranged in both age and experience level, and represented voices from across the museum sector. The interview transcripts were independently coded by the researcher and a research assistant. Using both purposive and open coding protocols based on a phenomenological paradigm, the analysis clarified the ways in which participants used and experienced professional learning to grow as educators (research sub-question S3).

Purposive coding uncovered examples for all 11 activity areas investigated in the online survey. Multiple forms of peer learning were documented and most participants found social learning to be especially valuable for helping them to stay up to date and meet the challenges of museum teaching practice. Learning activities that are generally undertaken alone, on the other hand, were much less frequently described. Participants appeared to appreciate being free to pursue professional learning on their own terms, though this independence was not immune to environmental influences. Financial considerations and the nature of employer supports for staff learning tended to impact the prevalence of individual activity types within the participants' personal learning ecosystems.

Open coding revealed one additional peer learning activity, Peer Conversations. Participants described the opportunity to freely exchange knowledge and explore ideas through constant informal discussions with team-mates and other museum employees as an invaluable component of their professional development. Open coding also exposed an experiential theme describing how participants tended to approach professional development opportunities. The Approach theme comprises four individual concept codes detailing the personal and situational factors that influenced the activity selection process: Convenience, Learning Mode, Mindset and

Selection. The ease with which participants could access a learning resource and extract relevant information from it was an important consideration. Although participants generally supported active learning in principle and suggested that the topic of interest dictated the activity type they chose, in practice passive learning formats were not uncommon. Finally, professional learning was found to be largely aimed at meeting immediate job needs rather than longer term career goals.

The next chapter, Chapter 6: Comparative Analysis and Discussion, will explore the connections and discrepancies between the qualitative results described in this chapter and the quantitative results described in Chapter 4: Quantitative Results. Framing these combined results within the IET interaction categories, I will also discuss how the findings relate to my thesis questions.

Chapter VI

Comparative Analysis and Discussion

The preceding two chapters considered the findings of the survey and interview data analyses separately. By treating the quantitative and qualitative results independently, attention and discussion focussed on how each data set addressed the study's three research sub-questions. As a final stage of data analysis, and in consideration of the main research question underpinning this study ("To what extent and in which ways do perceptions of personal investment serve to contribute to Canadian museum educators' decision to participate in formal and informal professional development activities?"), this chapter will bring together these separate sets of findings to present a unified picture of how personal investment perceptions impact the ongoing learning patterns of Canadian museum educators.

This chapter is organized in two sections. The first section, Comparative Analysis, will discuss how the quantitative and qualitative findings combine to describe museum educator professional development decisions in terms of the learning interaction categories adapted from Anderson's (2003) IET, namely, teacher-teacher, teacher-self, teacher-learner, and teacher-content. The second section, Relevance to the Research Question, reviews the study findings as they relate to each of the three research sub-questions and describes how these findings merge to address the main research question.

6.1 Comparative Analysis

To develop a cohesive picture of how perceptions of personal investment impact the professional development pursuits of museum educators, the results of the quantitative and qualitative data analyses described in Chapters 4 and 5, respectively, must be integrated. To facilitate this final stage of data analysis, both the survey and interview instruments were framed around the four learning interaction categories derived from Anderson's (2003) IET. This section

will present the results of a cross-comparison of the quantitative and qualitative data sets through the lenses of each IET-derived category. The ways in which personal and environmental factors interact to influence the ongoing learning habits of museum educators in Canada today will be highlighted.

As mentioned in Chapter 5: Qualitative Analysis, some of the activities described by the interview participants were not anticipated by the researcher and thus were not listed in the general activity descriptions included in the survey. A joint display chart comparing the activity descriptions used in the survey with those mentioned by interview participants is provided in Appendix F.

6.1.1 Teacher-teacher interactions. Learning through peer interactions was found to be a popular and highly valued form of learning for participants. In fact, all museum educators in this study participated in some form of peer learning. Post-hoc analysis of the survey data revealed low- to medium-level positive correlations in uptake rates across the four activities that comprised this category (r_{φ}=.203-.391). That is to say, participants often pursued multiple forms of peer learning for their professional development. Social linkages across activities, such as those described by the interview participants, may help to explain this tendency. For example, participants described attending conferences and courses for both formal knowledge gain (Beth, Charles, Erin) and for developing their professional networks (Beth, Charles). They also described leveraging the latent knowledge of their professional networks for ad-hoc learning and mentorship whenever a professional or job-related need arose (Fran, Charles). Beyond their individual networks, many interview participants also described participating in more structured Informal Groups. Some of these Informal Groups organized occasional conferences or courses to address the needs of their members (Beth, Erin, Fran). In this way, formal and informal peer

learning activities for museum educators today appear to be not only complimentary, but also mutually reinforcing.

In terms of personal investment, survey participants felt that peer-based learning was generally affordable: the mean of the median scores ($\bar{x}_{med}$) of the teacher-teacher activities being 2 ("low investment"). However, they also felt that these activities demand a certain amount of personal time ($\bar{x}_{med}$=3, "medium investment") and energy ($\bar{x}_{med}$=3) to pursue. These costs were often counterbalanced by perceptions of strong potential for skills development ($\bar{x}_{med}$=3.5) and the direct enjoyment that participants derived from participating in these formats ($\bar{x}_{med}$=2.5). Often, perceptions of financial commitment were negatively correlated with participation in peer learning activities. Informal Groups was found to be an exception, however, which had a positive correlation with participation (r_s=.246). This implies that when financial costs are associated with Informal Groups, these tend to present a low barrier to participation.

Employer support was found to positively correlate with participation in most forms of peer learning activities (r_s=.211-490). Although employer support did influence participation rates, it did not appear to influence participants' general perceptions of those activities. For example, mentorships were infrequently supported by museum employers and also had relatively low uptake among survey participants. Yet, survey participants scored Mentorships as having high value across all four benefit categories (Job Security/Advancement: median=3, "medium benefit"; Skill Development: median=4, "high benefit"; Personal Enjoyment: median=4; Interest in the Format: median=4). Meanwhile, 60% of museums offered association membership subsidies to their educators, yet survey participants generally felt that such memberships offered limited benefit in terms of job security or advancement (median=2, "low benefit"). Given the prevalence of utilizing one's professional network as a first line of inquiry for job related

questions, as discussed in Chapter 5: Qualitative Results, this finding is somewhat counter-intuitive.

The teacher-teacher interactions described in the interviews is characterized by a strong desire to openly share, exchange, and document knowledge across the profession. As a result, professional networks tend to have an influential role in these educators' professional development pursuits. There is also a sense that the relationships forged through these interactions may contribute to a sense of professional identity and belonging. The strong uptake rates of peer-based activities seen in the survey results support the idea that teacher-teacher interactions are highly valued and comprise a significant portion of the museum educator's professional development landscape. Peer-based learning activities can range from casual exchanges among colleagues to formally structured education programs.

6.1.2 Teacher-self interactions. Introspective learning played a more limited role within the professional development ecosystems of participants, with nearly 10% of survey respondents indicating that they never undertook any form of reflective learning. Of those participants who did use introspective activities for professional learning, organic and unstructured forms, such as casual reflection (85.61% participation), were found to be more common than structured self-assessments (54.35% participation). Despite the uptake rates described by the survey data, the interviews revealed that educators were generally self-aware and able to articulate their rationale for the activities they pursued in addressing their areas of weakness. This suggests that introspective learning may in fact influence, if not at a conscious level, the other learning activities that museum educators choose to pursue for their professional growth.

Post-hoc analyses of the survey data revealed that, similar to peer-based learning, participation in one form of introspective learning was associated with participation in the other

(r_{φ}=.297). As well, participation in this category of professional development was strongly linked to employer support (r_s=.271-562). Despite the minimal financial costs associated with them, nearly half of museum employers did not offer any support for these forms of professional learning. Survey participants felt that introspective learning required a fair amount of time ($\bar{x}_{med}$=3.5, "medium to high investment") and energy ($\bar{x}_{med}$=3.75) to pursue, but also suggested that it offered moderately high value for both skill development ($\bar{x}_{med}$=3.5) and enjoyment as a learning activity ($\bar{x}_{med}$=3, "medium benefit"). The interview participants that had experienced this form of learning found it to be a highly satisfying activity (Beth, Dawn). Thus, it is possible that providing educational initiatives that help both museum employers and educators to understand the types, resource demands, and benefits of professional introspection may result in greater uptake in this form of professional learning.

The teacher-self category encompasses the metacognitive and cognitive-behavioural activities that museum educators undertake for developing their professional identity and improving their practice. Contemplation and critical self-examination typify the teacher-self interactions described by interview participants. Given the often implicit nature of these types of activities, it is possible that teacher-self interactions are more common than the survey data or interviews would suggest.

6.1.3 Teacher-learner interactions. Learning from interactions with visitors and volunteers was a nearly ubiquitous form of professional development for participants, with only 1.50% of participants suggesting that they did not personally use information from learners to refine their professional practice. Employer support for visitor information collection may help to explain this prevalence, since over 80% of museums offered some form of support for collecting visitor feedback. One survey participant open commented that their museum required

its educators to solicit feedback at the conclusion of every group visit, while another commented that their museum had standardized all visitor feedback processes. In addition to post-visit surveys, non-reactive/observational and anecdotal feedback methods were also described by the interview participants. It is important to note that although the presence of visitor feedback mechanisms does not necessarily lead to educator learning, the study findings suggest that it may act to facilitate it: analysis of the survey data revealed a strong correlation (r_s=.392-.466) between employer support and participation in this form of professional learning.

Adoption of the more individual practice of professional praxis, however, was not as prevalent among survey respondents, with 14.81% suggesting that they never took advantage of this form of learning. As Dawn explained, the organizational structure and role delineations between educators and docents at her museum limited her ability to directly interact with, and therefore learn through praxis-based teaching.

Post-hoc analyses of the survey data revealed low-level correlation between uptake rates for Post-event Feedback and Praxis (r_φ=.222). Pursuit of these forms of learning were generally perceived as requiring minimal financial investment ($\bar{x}_{med}$=1.25, “none to low investment”) while demanding a fair amount of time ($\bar{x}_{med}$=3.5, “medium to high investment”) and energy ($\bar{x}_{med}$=3.5) investment. In exchange for this investment, teacher-learner interactions were seen as having high potential value in terms of skills development ($\bar{x}_{med}$=3.5, “medium to high benefit”), satisfaction of personal interest ($\bar{x}_{med}$=3.5), and personal enjoyment ($\bar{x}_{med}$=3). Notably, learning from visitors and volunteers was felt to have limited value for job security or advancement ($\bar{x}_{med}$=2, “low benefit”).

Museum educators use information gleaned from their direct and indirect interactions with learners to constantly monitor the impact of their teaching or leadership decisions. As

described in the interviews, these interactions can simultaneously inform program evaluations and be used as a base for reflective practice. The notion that every moment with learners is a potential learning moment for the educator was echoed by several of the interview participants. Engaging in meaningful conversations with supervised staff members and with docents who had school teaching backgrounds also provided valuable opportunities for learning. The participants acknowledged that teacher-learner interactions are powerful learning opportunities with the potential to influence not only their teaching behaviours, but also the philosophical perspectives that underpin their practice.

6.1.4 Teacher-content interactions. Teacher-Content interactions figure prominently in museum educator professional learning. Only 1.49% of participants indicated not participating in any form of teacher-content learning. This said, uptake rates across individual activities in this category varied from 16.67% of survey respondents not undertaking any Self-Study/Online learning to only 7.58% never undertaking Self-Directed Investigations. Post-hoc analyses of the survey data did not reveal any statistically significant correlations in uptake between the activities that comprise this interaction category.

With regard to participant perceptions of personal investment, teacher-content activities were generally perceived as demanding low financial resources ($\bar{x}_{med}=2$) and moderate investments of time ($\bar{x}_{med}=3.33$) and energy ($\bar{x}_{med}=3$), while offering moderate potential for skill development ($\bar{x}_{med}=3$), enjoyment ($\bar{x}_{med}=3$) and interest ($\bar{x}_{med}=3.33$).

Employer support for this category of professional development was shown to be positively correlated with participation ($r_s=.253\text{-}.373$), and over 70% of participants confirmed that their employer offered some form of support for these types of activities. Generally, support came in the form of financial subsidy/schedule accommodation or permission to use facility

resources for independently undertaking these activities. This trend was echoed by the interview participants: Beth confirmed that her employer funded the purchase of text resources for professional learning, while Erin took advantage of resources accessible through her institution for ongoing research and learning. Despite the direct supports offered by many employers, there was generally a low perception among survey participants that these activities contributed to their job security or advancement ($\bar{x}_{med}$= 2, "low benefit").

Data from the interviews suggested that convenience and accessibility considerations counted among the factors contributing to online resource usage in particular. A lack of employer support for staff learning was cited by one interview participant as a key reason for turning to webinars for learning (Dawn). However, webinars and online resources were similarly cited by other participants who had not indicated or implied that their employer was not supporting those activities (Beth, Charles). Thus, online learning appears to offer museum educators affordable learning resources where and when the individual desires.

Reading, both online and offline, was a popular activity among survey participants (93%), while the interviews suggested that participation might at times be influenced by perceptions of convenience (Beth). The interviews further revealed that professional reading encompassed both formal and informal texts in both online and traditional formats.

In the case of Self-Directed Investigations, survey participants rated this activity as having moderate costs ($\bar{x}_{med}$=2.6) and benefits $\bar{x}_{med}$=2.8) associated with them. Interview participants often described calling on their personal network when initiating a project, specifically to help identify further human or material resources of relevance to the issue being investigated (Beth, Erin, Dawn). One form of self-directed investigation not anticipated in the study design was visitations to other museums. Situated learning through in-person explorations

of how other institutions tackled an issue or design obstacle, in fact, was cited by four of the six interview participants as an activity they regularly pursued.

Overall, this study reveals a tapestry of Teacher-Content activities that museum educators use for independent learning. Online activities tend to feature prominently in the solo learning endeavours of museum educators today. The availability of online resources in multiple information formats allows museum educators to seek out those that best match their personal learning preferences and needs. Meanwhile, museum educators regularly take advantage of off-line opportunities to learn by experiencing the galleries and spaces of other institutions. Finally, Teacher-Content interactions appear to most suit individuals who possess an enthusiasm and aptitude for independent learning.

6.1.5 Summary of comparative analysis. This section offered a cross-comparison and narrative synthesis of the survey and interview data. In organizing the preceding discussion around the interaction categories derived by Anderson's (2003) IET, participant responses specific to individual activities merged to reveal general tendencies and collective perceptions among museum educators for various forms of professional development. The quantitative and qualitative data sets converged at several points, revealing four distinct pictures of how personal and environmental factors influenced the ongoing learning pursuits of participants. Points of divergence between the two data sets were highlighted and reveal opportunities for future investigation.

Collectively, Canadian museum educators are highly engaged in professional learning. Peer-based (teacher-teacher) learning activities are very popular, encompassing a spectrum of activities from formalized events to collegial discussions. As a result, an educator's personal network was found to play a particularly important role in their pursuit of ongoing learning.

Fewer educators regularly engaged in introspective (teacher-self) learning, despite the general perception among participants that these types of activities offer strong benefits for professional growth. The availability of employer supports was found to have a strong influence on participation rates for these forms of professional development.

Learning from interactions with visitors (teacher-learner) was the most common form of learning for participants. A shared sentiment among the study participants was that every interaction with visitors is an opportunity for professional learning. This said, the availability of formalized employer supports for evaluating the visitor experience was found to have the greatest impact on uptake rates for these forms of professional development.

Finally, participants appreciated the autonomy afforded by learning directly from content resources (teacher-content). Multi-directional research and experiential learning that took advantage of personal network connections and visitations to other institutions were popular forms of ongoing learning.

As the final phase of data analysis for this mixed-methods study, this section considered the quantitative and qualitative findings of the study in tandem. In doing so, four snapshots emerged of how personal and environmental factors interact to influence the ongoing learning habits of participants. In the next section, we will discuss how these joint findings help us to address the study's original questions.

6.2 Relevance to the Research Questions

The previous section presented a synthesis of the survey and interview findings, organized by the four learning interaction types derived from Anderson's (2003) IET theorem. In this section, we will review these findings as they relate to each of the study's research questions.

The original research question for this study asked “to what extent and in which ways do perceptions of personal investment serve to contribute to Canadian museum educators' decision to participate in formal and informal professional development activities?” To answer this question, three sub-questions were identified:

1. To what degree can perceptions of personal cost and benefit be used to predict museum educators’ participation in professional development activities? (S1)
2. To what degree can measures of age, formal education level, and years in practice be used to predict the types of PD activities museum educators are likely to participate in? (S2)
3. How do museum educators feel their participation in professional development activities contributes to their professional growth as educators? (S3)

We will now consider the separate and joint findings from the quantitative and qualitative phases of this study as they relate to each of these questions.

6.2.1 Relevance to sub-question 1. To address the degree to which perceptions of cost and benefit can be used to predict museum educators’ participation in professional development activities, correlational coefficients (Spearman’s r) and linear regression models were calculated for the independent variables of perceived cost (i.e., time commitment, personal energy input, financial costs, employer support) and perceived benefit (i.e., skill development, job advancement/security, personal interest, enjoyment of format) with participation in each professional development activity (dependent variable). With regard to individual factor effects, I surmised that correlations between the dependent variable (participation) would be moderately negative for the cost-related variables, and moderately positive for the benefit-related variables.

For combined effects, I anticipated moderately equivalent weights for each of the independent variables in predicting the dependent variable.

Financial Cost negatively correlated with participation in Conferences and Courses, Membership-based Groups, Self-Reflection, and Self-Directed Investigations (r_s=-.210--.270, $p<.05$), and positively correlated with Informal Groups (r_s=.246, $p>.01$). Linear regression modelling further revealed that Financial Costs also acted to negatively influence decisions for Self-Assessment, Praxis, and Self-Study/Online. Thus, personal financial costs appear to have a low level of negative impact on museum educators' ongoing learning activities.

Perceptions of both time and personal energy costs did not individually result in any statistically significant correlations with participation. However, these factors did have a low level of negative influence on participation in several activities when considered in combination with other variables, as demonstrated through linear regression modelling. Thus, personal time and energy costs appear to negatively impact the professional development decisions of museum educators to a limited degree.

Employer support positively correlated at a low to moderate level (r_s=.211-.562, $p>.01$) with participation in all activities except Informal Groups. Further, linear regression modelling revealed that employer support held a strong influence on participation decisions when considered in tandem with other cost/benefit variables. Thus, employer support was demonstrated to have a moderate level of positive influence on museum educators' activity patterns.

On its own, Skill Development exhibited a low level of positive influence on participation in Informal Groups, Self-Reflection, and Professional Reading/Viewing (r_s=.236-.304, $p<.01$). Linear regression also revealed a positive cumulative effect on participation in

Conferences and Courses, Mentorship, and Self-Assessment, while exhibiting a negative effect on Praxis. Thus, perceptions of Skill Development were shown to have a low level of positive influence on professional development participation in general.

Job Security/Job Advancement positively correlated with participation for only Self-Reflection and Self-Assessment (r_s=.189-290, $p<.05$). However, a low, negative direction effect was also revealed for Informal Groups, Self-Study/Online, and Professional Reading/Viewing, and a small positive effect for Conferences and Courses when this factor was considered alongside other cost/benefit variables. Thus, Job Security/Advancement considerations appear to have a low, but mixed directional, impact on participation decisions.

Satisfaction of Personal Interest positively correlated with participation in Informal Groups, Self-Reflection, Self-Assessment, Praxis, and Professional Reading/Viewing (r_s=.185-.345, $p>.05$). Positive influence extended to Mentorship and Self-Study/Online, when considered in combination with other factors. Thus, Satisfaction of Personal Interest was shown to have a low level of positive influence on participation decisions for many activities.

Finally, Enjoyment of the Format positively correlated with participation in Informal Groups, Self-Assessment, Praxis, Self-Study/Online and Professional Reading/Viewing (r_s=.178-.332, $p<.05$). Linear regression modelling further revealed a positive combined influence on participation in Self-Directed Investigations, and a negative combined influence on participation in Conferences and Courses. Thus, Enjoyment of the Format has a low impact on participation decisions for many activities.

In summary, cost and benefit perceptions do correlate with museum educator participation decisions. However, the degree and direction of these correlations vary.

Furthermore, not all cost and benefit factors were found to correlate with participation in each activity. Effects were strongest for Employer Support, Financial Costs, and Skill Development.

6.2.2 Relevance to sub-question 2. To address the degree to which age, experience level, and educational attainment may be used to predict museum educator participation in professional development activities, correlation coefficients (Spearman's r) and linear regression models were calculated. With regard to individual effects, I proposed moderately sized negative correlation coefficients for each of the independent variables (i.e., age, experience level, and educational attainment) for formal events, and moderately sized positive correlation coefficients for less formal events. For combined effects, I predicted moderately equivalent weights for the three independent variables in predicting participation in all activities.

Correlational analyses revealed two minimal, but statistically significant, negative correlations between participation and age: Praxis (r_s=-.200, p>.05) and Self-Guided Explorations (r_s=-.175, p>.05). Cumulative effects were unable to be confirmed, however, as the calculated linear regression models failed goodness of fit testing.

Similarly, years of experience negatively correlated to a low degree with participation only for Mentorship (r_s=-.181, p>.05) and to a moderate degree for Self-Guided Investigations (r_s=-300, p>.001). Cumulative effects were unable to be confirmed through linear regression as the calculated models failed goodness of fit testing.

Finally, educational attainment correlated with participation in a limited number of cases. Low level negative correlation was found between Diploma-level credentials and Informal Groups, Membership-based Groups, Praxis and Self-Study/Online (r_s=-.169--.237, p<.05). Master's attainment positively correlated to a low degree with Mentorship (r_s=.218, p>.01) and negatively correlated to a low degree with Self-Assessment (r_s=-.197, p>.05). Other educational

credentials negatively correlated to a low degree with participation in Self-Reflection (r_s=-.200, p>.05). As with age and experience level, cumulative effects for educational attainment were unable to be confirmed as the calculated linear regression models failed goodness of fit testing.

Thus, the findings of this study suggest that museum educator age, total years experience, and level of educational attainment are poor predictors of participation in most professional development activities.

6.2.3 Relevance to sub-question 3. To address the research question "how do museum educators feel their participation in professional development activities contributes to their professional growth as educators?", qualitative textual analysis using open and focussed forms of coding were performed on the interview transcripts.

Social learning was a prominent component of the professional development landscapes of participants. Peer-based learning (teacher-teacher) was often an on-going and reciprocal activity, with educators both seeking and offering advice to others on an ad-hoc basis. Several participants believed that opportunities for professional learning were constantly present and should be taken advantage of, regardless of their point of origin.

Introspective learning (teacher-self) was not often overtly described in the interviews. However, participant comments did suggest that the educators were generally aware of their professional needs and how to address them, as well as their personal learning preferences. The educators that did describe their introspective learning experiences felt that these activities were important to their development as professionals.

Online reading and independent research, including direct experiences with content at other museums, were common ways to stay abreast of best practices and inform current job demands. Although these activities tended to centre on teacher-content interactions, they were

frequently pursued as components within larger learning endeavours that also included peer consultation or discussion.

Finally, the convenience and accessibility of human and material resources, and their salience to addressing one's immediate job needs, were found to influence the type and direction of several participants' professional development activities.

In summary, the interview findings suggest that museum educators use a range of activities and interaction types to support their ongoing learning. Access to supports via the individual's employer and their personal professional networks also appear to a play key role in helping them achieve their goals.

6.2.4 Relevance to main research question. In consideration of the main research question, "to what extent and in which ways do perceptions of personal investment serve to contribute to Canadian museum educators' decision to participate in formal and informal professional development activities?" the individual findings related to Research Sub-questions 1, 2, and 3 merge to reveal a multi-faceted image of the factors that affect how museum educators choose to address their professional development needs.

Personal investment perceptions were revealed to impact the professional development of museum educators to a low degree overall. Perceptions of financial cost generally have a negative influence on participation decisions, while the potential for skill development, personal interest, enjoyment of the format have a generally positive influence. This said, the degree of influence of each of these factors was not consistent across activity categories. Employer support was the strongest predictor of participation, positively influencing decisions for most activities to a moderate degree. The museum educator's personal network and perceptions of convenience were also demonstrated to be strong considerations in shaping the educators' professional

learning activities. These effects do not appear to change significantly with age, experience level or educational attainment.

6.3 Summary

As the final phase of data analysis for this mixed-methods study, this chapter offered a cross-comparison and synthesis of the quantitative and qualitative findings. Four snapshots emerged of how personal investment perceptions impact the ongoing learning patterns of Canadian museum educators. Framed around the learning interaction categories adapted from Anderson's (2003) IET, namely, teacher-teacher, teacher-self, teacher-learner, and teacher-content, these snapshots provided a base from which the study's main research question could be addressed.

Teacher-teacher interactions represented a significant portion of museum educators' professional development landscapes. Peer-based learning was found to be highly valued within the profession, and individual professional networks played an important role in supporting knowledge development and resource dissemination. By contrast, teacher-self interactions, such as professional self-reflection, represented a much more modest portion of participants' learning activities. Despite low employer support rates, participants felt teacher-self type activities offered high value for supporting their advancement as professionals. Teacher-learner interactions included direct and indirect exchanges with museum visitors, supervised staff members, and museum docents. The information gleaned from these interactions influenced not only the educators' teaching behaviours, but also the philosophical perspectives that underpinned their practice. Finally, teacher-content interactions included multi-directional and experiential activities, both online and in-person. Although these activities tend to be more naturally solitary

endeavours, participants often took advantage of their professional network for locating appropriate content sources.

In response to research Sub-question 1 (“To what degree can perceptions of personal cost and benefit be used to predict museum educators' participation in professional development activities?”), the study confirmed that museum educator perceptions of cost and benefit correlate at a low to moderate degree with professional development participation. In particular, the availability of employer supports, and perceptions related to the financial costs and potential for skills development associated with a given activity had the strongest impact on uptake rates. The degree and direction of influence for these factors was found to be activity-specific rather than universal.

In response to research Sub-question 2 (“To what degree can measures of age, formal education level, and years in practice be used to predict the types of PD activities museum educators are likely to participate in?”), the study confirmed that age, educational attainment, and experience level were poor predictors of professional development activity selection.

In response to research Sub-question 3 (“How do museum educators feel their participation in professional development activities contributes to their professional growth as educators?”), the study confirmed that ongoing learning among museum educators is most often directed at addressing immediate job needs, rather than at broader career considerations. The study also revealed that educators’ professional networks, personality factors, and perceptions of the convenience and accessibility of human and material resources for learning were important factors contributing to their ongoing learning.

By organizing this chapter around the interaction categories derived by Anderson’s (2003) IET, participant responses specific to individual activities merged to reveal the tendencies

and perceptions of museum educators toward various forms of learning. The quantitative and qualitative data sets converged at several points, revealing four distinct pictures of how personal and environmental factors influenced the professional development pursuits of participants. Points of divergence between the two data sets were also noted and will be revisited in the next chapter for their potential in informing future research.

The next chapter, Chapter 7: Implications and Areas for Future Research, will discuss the implication of these findings for individuals and organizations seeking to support the ongoing learning of Canadian museum educators, the potential of Anderson's (2003) IET as a conceptual model capable of describing professional development inclusive of formal and informal activities, and delineate areas for further research.

Chapter VII

Implications and Areas for Future Research

In this chapter I will discuss the importance of the findings of this study for advancing the practice of museum education in Canada and for informing future investigations into the nature of professional ongoing learning. The chapter is organized in three sections. The first section, Implications for Practice, will relate the findings of the study to the practice and administrative leadership of museum education and offer suggestions for how these findings can be used to inform the development of professional development programs of value to both museum educators and their employers. The second section, Revisiting IET as a Conceptual Framework, will discuss the experience of applying IET to the analysis of museum educator professional development and the feasibility of extending the application of this model to other professional groups. The final section, Implications for Future Research, will describe the opportunities for further investigation that are opened up by this study.

7.1 Implications for Practice

This was a large study that explored the potential role of multiple variables on the professional development decisions of MEs. The results provide empirical evidence of both the types of PD that Canadian ME's are most commonly turning to for their ongoing learning and the factors that most strongly contribute to their activity selection decisions. As exploratory research, the study also offers data supporting the continued development of institutional policies and educational programs for advancing the theory and practice of museum education. In this section, I will briefly outline the significance of this study for informing each of these three areas.

7.1.1 Communities of practice. Professional relationships played a key role in the ongoing learning for many participants in this study. As discussed in Chapter 5: Qualitative Results, the educators often used both formal and informal PD events to expand their personal connections within the field and to engage with a broader community of practice. They then turned to their professional networks for just-in-time practice advice and assistance in locating information resources as a specific need arose. These timely, free exchanges of knowledge allowed the educators to avoid potentially costly pitfalls and speed up the development cycle for new programs. In these ways, the educator's professional network was an important facilitator to their ongoing learning.

The institutional benefits of supporting educator communities of practice are clear, and nearly two-thirds of museum employers currently do support their educators in participating in informal peer-based fora. This study provides evidence to support the continued development of programs and policies that foster diverse professional networks among museum educators. Employers and professional associations can foster such community development by continuing to provide multiple access points for educators seeking to convene and learn from one another.

7.1.2 Policy alignment. This study revealed that employer support has a strong positive relationship with the types of activities that museum educators choose for their PD. Many museums offer support for specified forms of ongoing learning among their educators and it is important that this support continue. However, the data suggests that current employer investments may not always be ideally directed toward the activities that are of greatest value to museum educators. For example, few employers formally supported self-assessments, mentorships, or praxis, yet participants described those activities as offering some of the strongest professional benefits. It is noteworthy that those same activities often require minimal

financial commitment on the part of the institution. Allowing MEs to provide input on staff development policies can allow museums to better allocate their resources toward those activities that have the highest potential impact on both the individual and the institution.

It is also acknowledged that Indigenous approaches to knowledge, learning, and teaching are distinct from western approaches, and that those approaches are essential to the Indigenous experience. As argued in Chapter 2: Review of the Literature, what a person knows is inextricable from how they came to know it. For this reason, adopting more participatory approaches to policy development is especially critical within any institution that employs Indigenous educators or addresses Indigenous objects and issues.

7.1.3 Educational development. This study reinforces and extends the literature which suggests that many museum educators today have limited formal knowledge of educational theory or practice (Bailey, 2003; Bamberger & Tal, 2007). Traditional teacher preparation programs can offer museum educators some grounding in learning theory and basic teaching strategies, but as discussed in Chapter 2, museum teaching has a unique scope that makes traditional programs insufficient for fully preparing new museum educators for the range of challenges they will face on the job. Some schools have begun to offer modules or advanced programs on museum education, and this study provides evidence that such training opportunities are highly needed.

As the field of museum education continues to develop, so does the structure of its body of knowledge. As this study has shown, many museum educators struggle to keep up with advances in practice and in knowing where to find reliable information. This is an area that professional leadership groups can play a critical role in fostering. Professional associations, for example, should continue to support the creation of professional resources and dissemination of

best practices in museum education. Likewise, higher education institutions can support the development of formal professional knowledge in museum education through expanded opportunities for collaborative research and theory development.

7.1.4 Summary. There is an eagerness to learn and to support visitor learning within the museum educator profession. But without appropriate environmental supports and a strong pedagogical model that addresses the unique parameters of museum-based learning, these efforts may not be as efficient or as effective as they might be. It is the job of leaders within the profession to use this information to encourage the development of policies and programs that fill in the gaps – whether it is supporting education training, discussing the impacts of mentorship and introspective learning on professional practice, or adjusting the instructional designs of PD programs to better align with the profession's interests using formats that they enjoy, to the ultimate benefit of improved museum programs and visitor experiences.

In the next section, I will summarize my experience of applying the IET model to the study of ongoing learning among museum educators.

7.2 Revisiting IET as a Conceptual Framework

Developed within of the field of distance education, Anderson's (2003) IET proposes that every formal instructional activity involves tangible and intangible costs to either the student, the teacher, or the institution. In applying IET as an organizing model for examining the professional development decisions of museum educators, this study tested the boundaries of this model for exclusively describing formalized events.

Professional development is a highly individual activity. As such, personal situational and environmental factors can significantly impact the individual's experience of a given learning interaction. IET proved to be a useful starting point for framing the spectrum of

activities encompassed within the concept of professional development. However, it became clear early on in preparing for this study that adjustments would be required to account for the greater degree of personal agency involved in professional development.

First, the IET model describes the potential costs associated with instruction, but not the potential benefits that may either moderate an individual's perceptions of those costs or motivate participation despite personal barriers. Due to the voluntary nature of professional development, the total value proposition of an activity was expected have an impact on the educator's participation decisions. Thus, potential benefits were incorporated alongside the potential costs proposed by IET to complete the value equation. As the study findings showed, perceptions of both benefits and costs did impact the ongoing learning decisions of MEs.

Second, in categorizing learning activities by IET interaction type, it became apparent that the model's single teacher-teacher category was too broad to provide an accurate picture of MEs ongoing learning habits. Furthermore, as mentioned in Chapter 2: Review of the Literature, it is arguable whether peer-based activities and introspective activities involve sufficiently similar processes to warrant grouping them into a single category within the existing model. Thus, for this study I chose to decouple social and self-reflective learning interactions to create two distinct categories (teacher-teacher, teacher-self). As the study findings showed, the activities in each interaction category did produce very different personal investment footprints, thus providing preliminary support for a potential revision to the IET to include inward communication as a unique interaction type.

In these ways, this study has confirmed that it is feasible to apply the IET as a conceptual model to research examining informal learning. However, to account for the additional factors

that can impact informal learning situations, modifications to the existing model may be necessary. These ideas will be elaborated later in this chapter.

7.2.1 Revisiting ecological constructivism. By using IET to document the ways in which individuals perceive, develop, and use network resources for ongoing learning, this study found evidence to support the premise of EC. Specifically, EC proposes that learning is both network-dependent and that an individual's receptiveness to instructional information is mediated by multiple cognitive and psycho-emotional factors.

The importance of cultivating a diverse network that includes both human and material resources for learning was the clearest aspect of EC supported by this study. As predicted by EC, the shape and nature of participant networks were highly individual, and appeared to be influenced by both situational factors, such as the type of museum the ME worked at, and by personal factors, including career stage, scientific literacy, and personal tastes. Psycho-emotional and cognitive factors, including personal beliefs and perceptions, were also found to impact resource cultivation and consultation decisions. The influence of other personal factors, such as sense of convenience, were also documented. This might suggest that node proximity within the network is an important factor in ongoing learning. This said, some participant comments also referenced knowledge transmission across nodes separated by multiple degrees. Their application, adjustment, and subsequent re-transmission of the amended knowledge is suggestive of the type of distributed, non-linear evolution of information that one would expect to find in an ecological system.

Although this study did not seek to address how individual network elements or personal characteristics may affect learning outcomes, it does provide compelling preliminary evidence to support the premises of EC. Specifically, an individual's access to, and preferences for, specific

learning resources does impact their ongoing development. As well, personal beliefs and perceptions also influence the types of resources individuals use for learning. In the following section, we will explore how these findings can be used to inform future research investigations related to ME practice, IET, and EC.

7.3 Areas for Future Research

As noted in Chapter 1: Introduction, this was the first study found in the literature to look at the factors that contribute to PD participation decisions among Canadian museum educators in quantitative terms. As such, it builds on the findings of earlier qualitative studies on museum educator professional development and brings together the extensive but somewhat fragmented literature of museum education, teacher development, and learning theory. It was a large study designed to offer a panoramic snapshot of the ongoing learning habits of museum educators across Canada. However, as noted in Chapter 3: Methodology, the sample size of the study and data granularity provide opportunities for further research.

Every effort was made to include participants who represent a range of museum types in order to develop a strong picture of how the profession approaches PD and the factors that most influence their ongoing learning activities. Limited response rates from individuals working within certain museum types, however, preclude secondary analyses at the sector level. With larger numbers, we would be able to describe and compare preferences between museum types. In addition, geo-political and gender-related data were not included in this study. Future research that includes this information would help to illuminate the ways in which regionality and gender may impact professional ongoing learning.

This study documented ME perceptions for a range of formal and informal activities by grouping individual PD activities into categories. As a result of this design approach, the study

was able to reveal that MEs favour certain categories of PD, as well as hold distinct expectations of the costs and benefits of each category. Potential variations in the perceptions and participation rates for specific activities within a given category, however, remain unclarified. As mentioned in Chapter 4: Quantitative Results, there is also a potential that confounding between a small number of cost/benefit factors occurred. Additional influencing factors not revealed by this study may also exist. Future investigations should seek to clarify both participation rates at the activity level and the range of unique factors that impact the uptake of those activities.

It is also clear from this study that environmental factors can be just as important as instructional formats and personal factors in shaping the learner experience and the potential attractiveness of an activity. For example, the availability of support structures within one's museum had a strong influence on participation in many forms of ongoing learning. Financial assistance and schedule accommodation were shown to have a direct relationship with many discrete forms of ongoing learning. However, the ways in which employers successfully foster learning through less discrete activities, such as praxis, and the institutional benefits they gain by offering supports for such activities are not fully known. Additional studies in this area could assist both educators and employers by providing evidence to support more inclusive policies on staff development.

By documenting ME engagement patterns in ongoing learning, this study offers a strong starting point for future investigations into the ways in which other groups of community-based educators maintain currency in their practice. Educators working outside of traditional academic settings are, at present, a severely under-researched population. It behooves us as a profession to ensure that our formal knowledge develop to reflect the range of settings in which educators practice today. Replication of this study for other educator groups, such as those working within

government, for private corporations, or for professional bodies, would help to ensure that our professional body of knowledge remains representative.

Finally, IET facilitated the organization of the range of activities that constitute PD today. This study deviated from the existing model by distinguishing introspective from social forms of teacher-teacher learning, and by incorporating benefit factors. The results confirmed distinct patterns in both uptake rates and cost/benefit perceptions for each form of teacher-teacher learning. Future research and theory development on IET should seek to confirm the extent of a distinct interaction category representing reflective forms of learning. As well, future investigations should continue to explore both the costs and benefits associated with a given instructional activity and how these factors contribute to the overall learner enjoyment described in the IET theses.

7.3.1 Implications for theory. As discussed in Chapter 2: Review of the Literature, this study was grounded in both EC and SC theories of learning. EC contends that dynamic environmental and psycho-emotional factors are constantly acting upon the individual, affecting both how and what they learn. SC research, by contrast, seeks to clarify how environmental elements and cognitive skills impact the learning process itself.

As described in the previous section, this study demonstrated that the individual learning needs of the educators, their format preferences, and situational factors all influenced activity selection to a degree. Of particular note, the cultivation, breadth and utility of the individual's professional network and content resource sets was a common thread in participant responses. The availability of environmental supports and personal estimations of the benefits and barriers related to different activities also influenced participation decisions. In other words, when given agency over their ongoing learning, individuals will activate situation-specific resource pathways

capable of satisfying both their professional learning needs and their learning style preferences. Thus, this exploratory study provides preliminary support for the EC proposition that both dispositional factors and resource availability can impact learning. However, much further research is necessary to clarify exactly how resource changes affect what is learned at the individual level. To what extent, for example, does the presence, proximity, or evolution of a given node within the ecosystem impact learning outcomes at another node? Although this study is supportive of the general premise of EC, at present it remains an emerging theory, and as such, many aspects await clarification and scrutiny.

Two key concepts advanced within SC research are learner self-efficacy and self-regulation. Although both concepts have relevance in a variety of situations across the life-span, prior studies have tended to focus on their application in formalized learning settings. By examining the self-directed ongoing learning behaviours of participants, this study provides supporting documentation of the practice of both positive self-efficacy beliefs and self-regulated learning within informal and lifelong learning contexts. Thus, this study extends the literature base for self-efficacy and self-regulated learning, and supports prior studies which have suggested that, once learned, individuals can continue to benefit from these skills throughout their adult and professional lives.

This study was not designed to verify or refute the premises of either EC or SC, but rather incorporated components of both theories in examining the professional development habits of Canadian MEs. The findings of this study confirm that both theories are capable of providing reasonable explanations of the ongoing learning behaviours of these community-based educators.

7.4 Summary

This study used a convergent mixed-methods design to investigate the ways in which perceptions of personal investment contribute to participation in formal and informal professional development activities among Canadian MEs. Informed by both SC and EC theories of learning, it documented the prevalence and perceived value of social, reflective, and document-based forms of ongoing learning. By examining ME practice through the lens of EIT, the study adds to the existing literature related to interaction-based models of learning, teacher development, museum education, and lifelong learning, and supports continued cross-disciplinary research on traditional and community-based teaching practices.

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Appendix A

Process Diagram

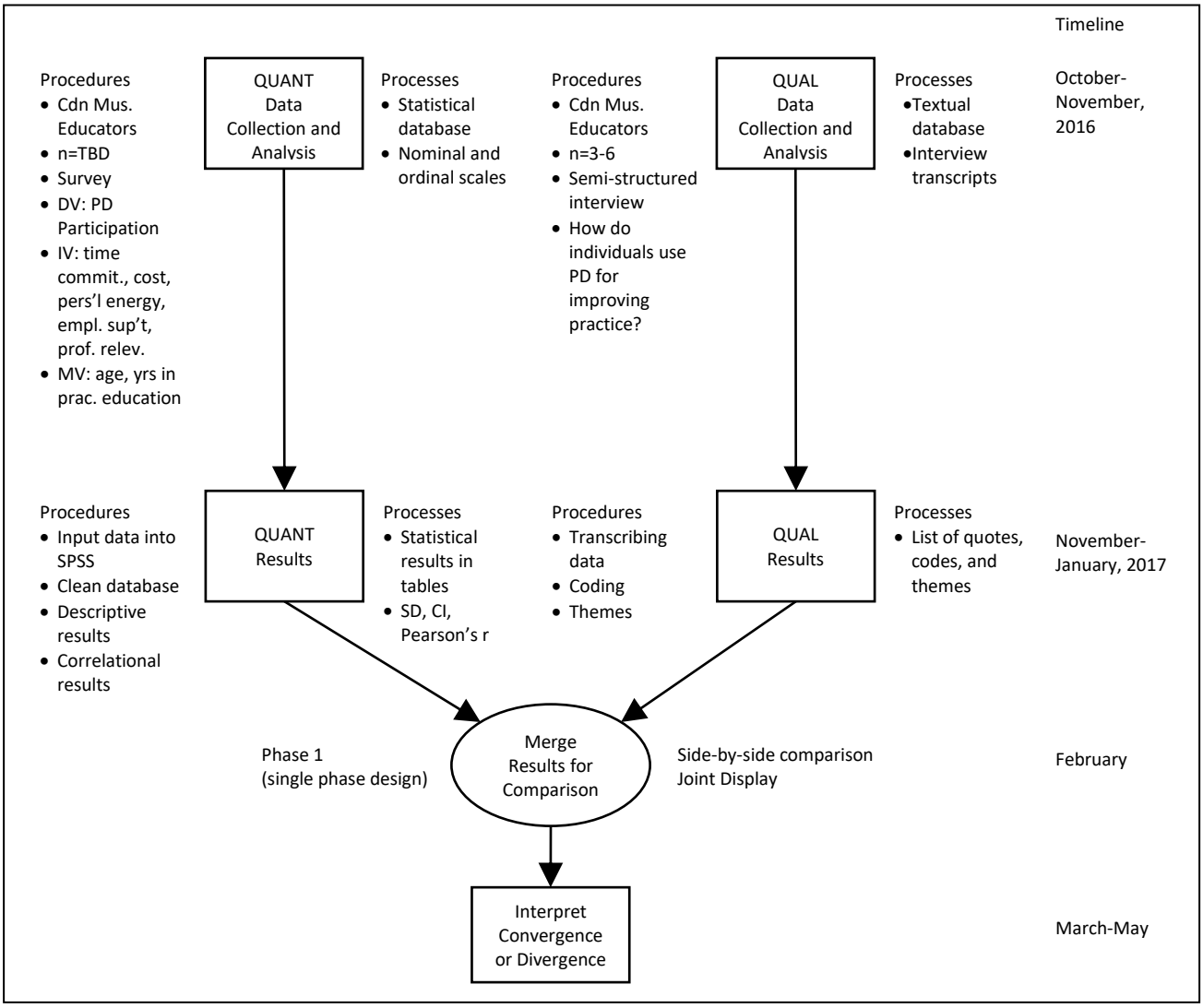

Figure 5. A convergent mixed methods design of museum educators' professional development activity patterns

Appendix B

Quantitative Survey Instrument

Individual and institutional factors affecting the professional development activities of Canadian museum educators

PARTICIPANT CONSENT

Principal Researcher:
Chett Bradley

Supervisor: (if applicable)
Dr Debra Hoven

You are invited to participate in a research study about the perceptions, motivations, and decision-making processes of Canadian museum educators with regard to their professional development activities. I am conducting this study as a requirement to complete my Master of Education degree.

As a participant, you are asked to participate in this study by completing a short online questionnaire about your perceptions and participation habits in various types of professional ongoing learning formats. Participation will take approximately 15 minutes of your time.

The results of this study can be used to support local advocacy efforts and the development of relevant professional development resources, decision-making tools, or programs for museum educators. Results may also help to inform future research related to museum teaching theory and practice.

Involvement in this study is entirely voluntary and you may refuse to answer any questions or to share information that you are not comfortable with. You will have the option to provide personal contact details if you would like to participate in a telephone interview during the second phase of the study. It is not mandatory to agree to be interviewed, or to provide any personal or identifiable information or data.

You may withdraw from the study at any time by simply closing out of your browser. Once you submit your completed survey, however, data cannot be withdrawn as the survey is completely anonymous. Please print a copy of this consent form for your records.

All hard copy data will be kept in locked cabinets in my office. All electronic data will be kept in a password protected computer at my office. All information and records will be destroyed by confidential shredding; electronic records will be deleted when all project requirements have been met (March, 2021).

Results of this study will be submitted to Athabasca University and will be publicly available on the Athabasca University DTheses site (https://dt.athabascau.ca/jspui/). Results may also be published in academic and professional journals and/or presented at professional conferences.

Additional details regarding this study and the measures in place to ensure the security of your submitted responses are described in the study's Letter of Information (https://drive.google.com/file/d/0B5ORR4SJWUXAelpCbzBEbUh1MUk/view?usp=sharing). If you have any questions about this study or require further information, please contact Chett Bradley using the contact information above.

This study has been reviewed by the Athabasca University Research Ethics Board. Should you have any comments or concerns regarding your treatment as a participant in this study, please contact the Office of Research Ethics at 1-800-788-9041, ext. 6718 or by e-mail to rebsec@athabascau.ca.

Thank you for your assistance in this project.

CONSENT:

The completion of the survey and its submission is viewed as your consent to participate.

SECTION A: PERSONAL BACKGROUND

Q1. Do you currently work in a museum educator role in which your responsibilities include designing or advising on the museum's educational or public learning programs?

Answer type: Binary

Answer options:

1. Yes
2. No

Q2. Please indicate the type of museum you currently work for:

Answer type: Multiple choice (multiple select)

Answer options:

1. Art gallery
2. Aquarium or Zoo
3. Historic property
4. Human or natural heritage institution
5. National/Provincial Park
6. Pubic garden
7. Science centre
8. Other (describe)

Q3. Please indicate your age as of today:

Answer type: Multiple choice (single select)

Answer options:

1. <25
2. 25-34
3. 35-44
4. 45-54

5. 55-64
6. >65

Q4. Please briefly describe your educational history. For example, if you have an undergraduate degree in archaeology, under Bachelor's Degree(s) say "BA (Archaeology)". If you have completed multiple programs at the same level, separate your answers with a semi-colon. (e.g., "MFA; MEd (Art Ed.)")

Answer type: Multiple short answer

Answer options:

1. College Diploma(s) (describe)
2. Bachelor's Degree(s) (describe)
3. Master's Degree(s) (describe)
4. Doctoral Degree (describe)
5. Professional certifications (describe)
6. Other (describe)

Q5. Please indicate how many years you have been practising specifically as a museum educator

Answer type: Multiple choice (single select)

Answer options:

1. 1-5
2. 6-10
3. 11-15
4. 16-20
5. >20

SECTION B: PEER LEARNING ACTIVITIES

The following questions will ask you about your perceptions of professional learning activities that are performed alongside other museum professionals and in which knowledge is primarily exchanged through discussion, collaboration or direct instruction.

You may currently participate in some or none of these activities. Please respond to every question to the best of your abilities, even if you do not currently participate in a particular activity.

[AUTHOR'S NOTE: Sub-questions a-d (further below) are asked as they pertain to each of the following activities.]

(Q6) Conferences and Courses: This category includes professional conferences, hands-on workshops, academic courses, and similar in-person events which focus on improving museum teaching practice through formal knowledge sharing or instruction.

(Q7) Informal Group: This category includes online and in-person activities such as reading clubs, social networking sites (e.g. LinkedIn, Facebook), discussion groups, and similar types of social resource groups through which your knowledge of museum teaching practice is enhanced informally through discussion or resource sharing.

(Q8) Membership-based Groups: This category includes membership within a professional association, formal network, collective, or similar groups through which your knowledge of museum teaching practice is informally enhanced through means typically other than direct instruction (e.g., newsletters, association resources, etc.).

(Q9) Mentorship: This category includes job shadowing, observing, modelling, or directly seeking practice advice/feedback from experts or more advanced peers.

a "How often do you typically participate in these types of activities?"

Answer type: Multiple choice (single select)

Answer options:

1. Never
2. Less than once per year
3. Once every 6-12 months
4. Once every 4-6 months
5. Once every 1-3 months

b "Does your employer provide official support for participating in these types of activities?

Answer type: Multiple choice (single select)

Answer options:

6. No, my employer does not provide any support for participating in this type of activity
7. Yes, by offering financial assistance or schedule accommodation for me to participate in this activity organized outside the institution
8. Yes, by permitting the use of facility resources in order for the education team to organize this activity directly
9. Yes, by formally organizing this type of activity specifically for the benefit of staff
10. Yes, by encouraging participation in this activity organized as primarily public programming
11. Yes, other (describe)

c "What degree of personal investment do you perceive participating in these types of activities requires/would require of you in terms of:

Answer type: Multiple choice matrix (single select per row)

Answer options:

1. None 2. Low 3. Medium 4. High

1. Financial expense
2. Time dedication
3. Energy required

d What degree of personal benefit do you perceive participating in these types of activities has/would have for you in terms of:

Answer type: Multiple choice matrix (single select per row)

Answer options:

	1. None	2. Low	3. Medium	4. High
1. Professional skill development				
2. Professional security or advancement				
3. Satisfaction of personal interest				
4. Enjoyment as a learning format				

SECTION C: REFLECTIVE LEARNING

The following questions will ask you about your perceptions of professional learning activities primarily performed alone.

You may currently participate in some or none of these activities. Please respond to every question to the best of your abilities, even if you do not currently participate in a particular activity.

[AUTHOR'S NOTE: Sub-questions a-d in Section B are repeated for each of the activities below.]

(Q10) Self-reflection: This category includes journaling, critical reflection, and similar activities focusing on personal introspection of your teaching attitudes or approaches.

(Q11) Self-assessment: This category includes activities in which you attempt to objectively evaluate your teaching practice. For example, by reviewing video recordings of your lessons, or by comparing your knowledge or behaviours against checklist, rubric, or scorecard (either created by you or using an established template).

SECTION D: LEARNING FROM YOUR LEARNERS

The following questions will ask you about your perceptions of professional learning activities between yourself and visitors or volunteers.

You may currently participate in some or none of these activities. Please respond to every question to the best of your abilities, even if you do not currently participate a particular activity.

[AUTHOR'S NOTE: Sub-questions a-d in Section B are repeated for each of the activities below.]

(Q12) Post-visit Feedback: This category includes collecting and reviewing visitor/volunteer response to their learning encounter (e.g. satisfaction surveys, verbal comments), in order to monitor your teaching practice or program designs.

(Q13) Praxis: This category includes testing out new techniques and adjusting your teaching strategies based on how students/visitors are responding to the experience, and then using results from these modifications to continually refine your teaching philosophy or approach to museum teaching.

SECTION E: LEARNING FROM CONTENT

The following questions will ask you about your perceptions of professional learning activities between yourself and visitors or volunteers.

You may currently participate in some or none of these activities. Please respond to every question to the best of your abilities, even if you do not currently participate a particular activity.

[AUTHOR'S NOTE: Sub-questions a-d in Section B are repeated for each of the activities below.]

(Q14) Self-study Courses and Lectures: This category includes self-paced courses, lectures/webinars, and similar formats which maximize attention on the subject matter while minimizing interaction between classmates or the instructor.

(Q15) Professional Reading, Viewing or Listening: This category includes reviewing scholarly papers or topical books, watching instructional videos or documentaries, or listening to podcasts or other audio recordings.

(Q16) Self-directed Exploration: This category includes activities in which you independently seek, review, and reflect on multiple learning resources related to a single teaching issue or knowledge gap you are currently facing. These activities may be spontaneous or may involve articulating specific learning goals, strategies, or deadlines ahead of time.

SECTION F: THANK YOU

Thank you. We appreciate your participation in this research project. We will be conducting short (10-15min) interviews with a small number of participants to understand the impact of professional development participation on museum educator practice.

Q17. Would you be willing to participate in an interview?

Answer type: Binary

Answer options:

1. Yes
2. No

Q18. If you answered yes, please provide a contact telephone number or email address, and the best days or times to can reach you:

Answer type: Short-answer

[Open text]

Appendix C

Semi-Structured Interview Schedule

Intro: Thank you for meeting with me today. You have been asked to participate in this interview on museum educator learning to understand better the types of activities you personally enjoy and how you see those activities impacting your professional growth. I will be recording our conversation for reference within this research project. Do I have your permission to record our conversation?

I: First, can you tell me a little bit about your background as a museum educator.

II: Let's talk about learning opportunities that primarily involve peer learning. Tell me about your experiences.

> Optional prompt 1: What draws you to participate in those particular activities?
> Optional prompt 2: What types of things do you prefer to learn this way?

III: What about learning moments with volunteers and museum visitors?

> Optional prompt 1: In what ways do these reflect your approach to teaching?
> Optional prompt 2: What types of things do you prefer to learn this way?

IV: Thinking about when you're off learning by yourself—what types of things are you doing?

> Optional prompt 1: What draws you to these particular activities?
> Optional prompt 2: What types of things do you prefer to learn this way?

V: Now tell me about times where you've been primarily concerned with learning or applying new material. What does that look like for you?

> Optional prompt 1: In what ways do these reflect your approach to teaching?
> Optional prompt 2: What types of things do you prefer to learn this way?

VI: One last question - if you had to select only one, between activities you've done by yourself, activities that have involved peers, and activities where you learned from visitors or volunteers, which one do you feel has shaped you the most as a museum educator and why?

Thank you for meeting with me today. I have enjoyed our discussion. I will be transcribing our conversation in the next few days and would like to send you a copy for verification that it is accurate. Would that be ok with you? Thank you again, have a great day.

Appendix D

Sample Coded Interview Transcript (Extract)

CB: I'd like to talk about learning opportunities that primarily involve peer learning. Tell me a little bit about your experiences in this area.

"Dawn": That is rather encompassing. In some cases, <Mentorship> <Employer Support> I find just being given the opportunity to watch my peers delivering a similar program to be valuable. </Mentorship> But, beyond just being given the time to watch them, there is also the opportunity to evaluate or coach those programs. That has sometimes been done in a peer-to-peer context. <Self-Assessment> <Mentorship> So, instead of management performing the evaluation or coaching it is your peers that fill out the form and then talk about it together. </Self-Assessment> </Mentorship> <Conferences-Courses> <Peer Conversations> There are some times that it has been suggested that if someone goes to other facilities or go to a conference that they prepare a presentation on what they observed and share that with the group. </Conferences-Courses> <Peer Conversations> </Employer Support> Usually it's done fairly quickly. That is what is more immediately coming to my mind, but I'm sure I'm probably forgetting something.

CB: (opt prompt) So are there particular types of things do you prefer to learn this way?

"Dawn": <Convenience> <Peer Conversations> Everyone comes with such diverse interests and backgrounds that my peers will tend to investigate some knowledge or technique more than I do, so when there is that opportunity for them to present or share that knowledge I appreciate it and tend to find it valuable. </Convenience> </Peer Conversations> <Self-Assessment> But when it comes to program development and delivery, <Peer Conversations> our peer to peer coaching/evaluations I find are rewarding for both of us who participate in that process. </Peer Conversations> </Self-Assessment>

CB: Ok great. So, this next question is very similar, but I would like you to tell me about learning moments with any volunteers at the museum or the museum visitors directly.

"Dawn": The volunteers in some cases have more face time with visitors than I do. They tend to have more volume of interactions that a are two-way, whereas my program delivery tends to be a lot of that 'sage on the stage' kinda thing where there isn't that much two-way conversation. <Learner Feedback> Our volunteers tend to be one-on-one with our visitors, so I feel they're able to report a little bit more on the nuance of how visitors see a particular exhibit or issues that our visitors face that we need to address from a visitor experience point of view, having more of those conversations that help us to better understand where our audiences are coming from. I feel like that's what I pick up more from our volunteers. </Learner Feedback> The volunteers tend to look at me more as a source of information as opposed to someone who can learn stuff from them. So it's kinda interesting. I sometimes struggle with that. I'm like "tell me about the things you know" and they're like "oh no no, you know all the things." We do have some volunteers that were veterinarians in the past, or school teachers, or massive dorks about insects, that kind of thing. So sometimes volunteers do provide that resource-specific information, but for the most part – at least with my interactions with them – it tends to be a bit more of them giving us

information about how our audiences feel about a particular topic or how they interact with different displays or exhibits. <Learner Feedback> I do appreciate the times when I get to speak one-on-one with our visitors. They can tell me more about what they experience from their worldview and it helps me to be more responsive to how to tailor information towards them. I feel that's generally how my audience interactions tend to be. Understanding them so I can make the content I'm trying to get across most relevant to them. </Learner Feedback>

CB: (opt prompt) I want to pause on that for a moment. You mentioned that a lot of your programs tend to be more traditional didactic, one-way, but you also said that you appreciate being able to interact and tailor the information to the audience. Those sound like very different approaches. Which is your preference as an educator and how do you get that preference across in your teaching?

"Dawn": Within interpretation, there is certainly the one-way form of communication, but now there's more and more of a push toward that two-way – some people call it constructivism, some people might base it on inquiry learning, and <Self-Directed Exploration> <Self-Reflection> it's something that I've been more interested to explore lately solely because of where we as a culture have moved towards with increased access to information online </Self-Directed Exploration>, you can watch TED talks, that sort of thing. <Mindset> So, I feel like [in order] for our organizations to not lose our relevance, it's important that we are able to define ourselves as separate than just being able to google something, or look it up on Wikipedia or hear it on a TED talk. We need to have that two-way sort of interaction with our audiences to remain relevant to them. </Self-Reflection> <Mindset> Right now at the aquarium with some of our shows and programs [it's not that way]. We can't make a dolphin show very two-way for example. There are 400 people there. I can't as of yet see any other way to approach that. However, <Mindset> I am very interested in our organization increasingly offering two-way opportunities for our visitors. I don't know in what format yet, but for example, we don't offer tours right now. We used to in the past but they weren't overly successful. Maybe we just need to approach them in a different way. I would be interested in us having that opportunity to explore more of that to ensure that our site stays relevant. </Mindset>

I am a certified interpretive trainer for the National Association for Interpretation, and their course for the certified interpretive guides is quite focussed on that more traditionalist approach where you develop a theme at the start of your program and you develop it and support it through this relatively one-way [presentation]. Of course, you can have engagement strategies sprinkled throughout, but the idea is that you come into the conversation with the theme already developed, whereas <Mindset> with constructivism you speak with the visitors and then you determine what the theme is based on what your visitors have to say. It's something I'm interested in and would like to see more of. </Mindset>

Appendix E

Tables of Analyses

1. Frequency of participation in PD activities

Activity	n	Never	>1/yr.	6-12mo.	4-6mo.	1-3mo.	<1/mo.
Q6	151	5	45	61	21	13	6
Q7	153	11	19	31	21	22	49
Q8	150	28	26	36	17	24	19
Q9	150	53	35	21	14	7	20
Q10	139	20	24	16	18	12	49
Q11	138	63	27	20	6	10	12
Q12	134	5	9	21	14	33	52
Q13	135	20	17	28	16	24	30
Q14	132	22	36	25	24	16	9
Q15	132	10	13	11	24	30	44
Q16	131	12	20	21	26	23	29

2. Employer support by type for PD activities

Activity	n	None	Financial/ Sched. Accom.	Facility Resources	Org on staff behalf	Public programs
Q6	152	13	110	57	39	41
Q7	153	58	46	34	10	35
Q8	151	50	64	31	16	27
Q9	150	68	31	31	18	19
Q10	138	68	25	34	14	NA
Q11	139	69	15	27	17	NA
Q12	134	20	37	52	54	NA
Q13	135	32	33	51	33	NA
Q14	134	40	56	36	20	21
Q15	132	44	43	45	14	22
Q16	131	40	39	41	15	24

3. Perceived levels of personal cost and benefit for PD activities

	Cost Factors			Benefit Factors			
Activity	Finance	Time	Energy	Skill Dev.	Job Adv/ Security	Interest	Enjoy Format
Q6	2	3	3	4	3	4	4
Q7	2	3	3	3	2	3	3
Q8	2	3	3	3	2	3	3
Q9	2	4	4	4	3	4	4
Q10	1	3	3*	4	2	3	3
Q11	1	4	4	3	2	3	3
Q12	1	3	3	3	2	3	3
Q13	1*	4	4	4	2	4	3
Q14	2	4	3	3	2	3	3
Q15	2	3	3	3	2	3	4
Q16	2	3	3	3	2	3	3

Notes: 1=None; 2=Low Level; 3=Medium Level; 4=High Level. * multiple modes exist, lowest mode is listed.

4. Relationships between PD participation rates, employer support, and personal cost/benefit factors[a]

Activity	Empl. Support[b]	Finance	Time	Energy	Skill Dev.	Job Adv/ Security	Interest	Enjoy Format
Q6	0.211†	-0.204*	0.072	0.052	-0.001	0.033	-0.089	-0.008
Q7	0.096	0.246†	0.040	-0.038	0.241†	0.026	0.345‡	0.274†
Q8	0.475‡	-0.270†	-0.002	0.081	0.027	-0.057	0.044	0.095
Q9	0.490‡	-0.113	-0.046	0.006	0.096	-0.035	0.035	0.089
Q10	0.271†	-0.212*	-0.156	0.028	0.304‡	0.189*	0.201*	0.151
Q11	0.562‡	-0.098	-0.031	-0.084	0.058	0.290†	0.241†	0.301‡
Q12	0.392‡	0.115	-0.037	0.064	0.077	0.085	0.101	0.006
Q13	0.466‡	0.090	0.047	0.062	0.114	0.067	0.185*	0.190*
Q14	0.296‡	-0.137	-0.083	-0.106	0.110	-0.051	0.157	0.178*
Q15	0.373‡	0.076	0.007	0.002	0.236†	0.089	0.224†	0.332‡
Q16	0.253†	-0.210*	-0.022	-0.027	0.078	-0.076	0.121	0.107

Notes: [a] Spearman's r. *b.* Absolute value applied. * $p \leq 0.05$; † $p \leq 0.01$; ‡ $p \leq 0.001$.

5. Cost and benefit factors predicting participation in PD activities[a]

Activity	b	Emp	F	T	E	SD	JA	I	EF	r	adj r²	F sig
Q6	0.422	0.754	-0.239	0.163	0.028	0.332	0.147	-0.010	-0.165	0.418	0.122	0.002
Q7	1.495	-0.062	-0.311	0.381	-0.501	0.115	-0.279	0.304	0.613	0.457	0.161	>.001
Q8	1.945	0.957	-0.414	-0.068	-0.022	0.287	-0.139	0.339	0.180	0.491	0.192	>.001
Q9	-0.133	1.143	-0.096	-0.593	0.337	0.512	0.088	0.313	-0.218	0.490	0.184	0.001
Q10	-0.182	0.348	-0.278	-0.158	-0.049	0.653	0.229	0.721	-0.214	0.601	0.309	>.001
Q11	-0.540	1.289	-0.435	0.128	-0.302	0.187	0.177	0.227	0.424	0.598	0.305	>.001
Q12	1.215	0.979	-0.077	-0.214	0.045	0.038	0.139	0.725	-0.190	0.449	0.148	0.001
Q13	-0.393	0.898	-0.238	0.058	0.287	-0.584	0.125	0.768	0.327	0.493	0.188	>.001
Q14	-0.949	0.715	-0.195	0.205	-0.180	0.219	-0.203	0.521	0.314	0.488	0.183	>.001
Q15	-0.960	0.542	0.106	0.216	-0.323	0.347	-0.350	0.245	0.916	0.585	0.296	>.001
Q16	0.693	0.247	-0.384	0.684	-0.747	-0.026	0.051	0.309	0.618	0.468	0.161	0.001

Notes: Emp – Employer support; F – Financial costs; T – Time costs; E – Energy costs; SD – Skill Development benefits; JA – Job Security/Advancement benefits; I – Personal Interest benefits; EF – Enjoy Format benefits. [a] Linear regression of all factors.

6. Cost and benefit factors predicting participation in PD activities[a]

Activity	b	Emp	F	T	E	SD	JA	I	EF	r	adj r²	F sig
Q6	0.444	0.758	-0.237	0.172		0.331	0.149		-0.170	0.418	0.135	<.001
Q7	1.530		-0.302	0.377	-0.495		-0.240	0.361	0.604	0.455	0.171	<.001
Q8	1.898	0.908	-0.446					0.305		0.481	0.213	<.001
Q9	-0.186	1.143		-0.641	0.361	0.657				0.481	0.205	<.001
Q10	-0.290	0.341	-0.301	-0.175		0.613	0.218	0.587		0.593	0.320	<.001
Q11	-0.517	1.305	-0.413		-0.186	0.259	0.204		0.542	0.594	0.314	<.001
Q12	1.166	1.049		-0.175				0.666		0.435	0.170	<.001
Q13	-0.394	0.930	-0.217		0.324	-0.522		0.840	0.286	0.489	0.198	<.001
Q14	-0.607	0.703	-0.169				-0.167	0.598	0.344	0.480	0.197	<.001
Q15	-0.720	0.527		0.273	-0.342	0.369	-0.323		1.078	0.580	0.302	<.001
Q16	0.828	0.281	-0.376	0.649	-0.688				0.876	0.462	0.178	<.001

Notes: Emp – Employer support; F – Financial costs; T – Time costs; E – Energy costs; SD – Skill Development benefits; JA – Job Security/Advancement benefits; I – Personal Interest benefits; EF – Enjoy Format benefits. [a] Backward linear regression of factors relevant at F sig ≤.001.

7. Relationships between PD participation, age, educational background, and years of experience[a]

Activity	Age	Exper.	Dip	Bachelor	Master	Doctor	P. Cert	Other	PED
Q6	-0.085	-0.098	-0.116	-0.005	-0.074	0.082	-0.033	0.039	0.103
Q7	-0.026	-0.057	-0.170*	0.112	-0.082	0.058	0.103	0.006	0.011
Q8	-0.010	-0.025	-0.169*	0.017	-0.129	0.129	0.154	-0.018	0.158
Q9	-0.065	-0.106	-0.134	0.033	0.218†	0.106	-0.157	-0.081	0.262
Q10	-0.134	-0.181*	-0.113	-0.031	-0.086	0.037	-0.007	0.200*	0.052
Q11	-0.076	-0.068	0.023	0.021	-0.197*	0.027	0.134	-0.008	-0.101
Q12	-0.108	-0.062	-0.046	-0.082	-0.138	-0.018	-0.049	0.059	0.291
Q13	-0.200*	-0.145	-0.181*	0.028	-0.002	0.032	-0.026	-0.053	0.106
Q14	-0.029	-0.032	-0.237†	-0.060	-0.106	-0.016	0.050	0.106	-0.051
Q15	-0.128	-0.120	0.035	0.126	0.086	-0.040	-0.024	0.094	0.030
Q16	-0.175*	-0.300‡	-0.084	-0.037	0.028	-0.073	0.054	0.016	0.209

Notes: [a] Spearman's r. * $p \leq 0.05$; † $p \leq 0.01$; ‡ $p \leq 0.001$.

8. Age, education, and years of experience predicting participation in PD activities[a]

Activity	b	Age	Education	Yrs. Exp.	r	adjusted r^2	F sig
Q6	1.013	-0.027	0.005	0.010	0.151	0.001	0.365
Q7	0.919	0.015	0.001	-0.019	0.072	-0.016	0.866
Q8	0.957	-0.043	-0.006	0.034	0.051	-0.019	0.949
Q9	0.442	0.024	0.067	-0.018	0.170	0.007	0.267
Q10	0.833	0.025	0.010	-0.038	0.111	-0.011	0.662
Q11	0.802	-0.056	-0.055	0.035	0.154	0.000	0.387
Q12	1.036	-0.024	-0.011	0.012	0.118	-0.010	0.630
Q13	0.888	-0.029	0.042	-0.033	0.237	0.033	0.065
Q14	0.985	-0.050	-0.013	0.008	0.131	-0.007	0.553
Q15	0.917	-0.003	0.020	-0.019	0.136	-0.006	0.525
Q16	0.847	0.013	0.026	-0.025	0.134	0.007	0.536

Notes: [a] Linear regression of all factors.

9. Age, education, and years of experience predicting participation in PD activities[a]

Activity	b	Age	Education	Yrs. Exp.	r	adjusted r^2	F sig
Q6	1.029	-0.020			0.130	0.010	0.138
Q7	0.919	0.015	0.001	-0.019	0.072	-0.016	0.505
Q8	0.957	-0.043	-0.006	0.034	0.051	-0.019	0.650
Q9	0.478		0.064		0.163	0.019	0.106
Q10	0.833	0.025	0.010	-0.038	0.111	-0.011	0.503
Q11	0.700		-0.049		0.119	0.006	0.193
Q12	1.036	-0.024	-0.011	0.012	0.118	-0.010	0.437
Q13	0.828		0.045	-0.047	0.277	0.036	0.023
Q14	0.946	-0.043			0.123	0.007	0.215
Q15	0.910		0.021	-0.021	0.135	0.002	0.270
Q16	0.833		0.024		0.101	0.002	0.454

Notes: [a] Backward linear regression.

10. Relationships between participation rates across PD activities[a]

	Teacher-Teacher				Teacher-Self		Teacher-Student		Teacher-Content		
	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16
Q6	1	0.302‡	0.372‡	0.298‡	0.332‡	0.100	0.136	0.272†	0.412‡	0.233‡	0.052
Q7		1	0.391‡	0.303‡	0.231†	0.065	0.222‡	0.124	0.277‡	0.108	0.040
Q8			1	0.203*	0.121	0.160	0.219*	0.221†	0.273†	0.150	-0.003
Q9				1	0.283‡	0.090	0.136	0.255†	0.100	0.030	0.061
Q10					1	0.297‡	0.078	0.481‡	0.336‡	0.224†	0.305‡
Q11						1	0.233†	0.279‡	0.132	-0.035	0.219*
Q12							1	0.222†	0.279‡	0.040	0.145
Q13								1	0.184*	0.113	0.307‡
Q14									1	0.221†	0.200*
Q15										1	0.223‡
Q16											1

Notes: [a] Pearson's Phi; * $p \leq 0.05$; † $p \leq 0.01$; ‡ $p \leq 0.001$.

Appendix F

Joint Display and Reporting Frame

Interaction Category	Survey Description	Quantitative Findings	Qualitative Findings
Teacher-Teacher			
Conferences and Courses	"This category includes professional conferences, hands-on workshops, academic courses, and similar in-person events which focus on improving museum teaching practice through formal knowledge sharing or instruction."	High participation rate at moderate frequency. Medium cost with high benefit perceptions. Strong positive correlation between participation and Employer Support.	Activities described: Conferences, certification programs, workshops, short presentations, case studies, structured courses. Events were both peer developed and association based. Local, regional, national, and international in scope.
Informal Groups	"This category includes online and in-person activities such as reading clubs, social networking sites (e.g. LinkedIn, Facebook), discussion groups, and similar types of social resource groups through which your knowledge of museum teaching practice is enhanced informally through discussion or resource sharing."	High participation rate at high frequency. Low financial cost, medium time and energy cost, and high benefit perceptions. Limited employer support.	Activities described: Casual in person meet-ups, listservs, blogs, online forums, online reading clubs. Due to the range of programs offered by associations, some activities overlap with Membership-based Groups category.
Membership-based Groups	"This category includes online and in-person activities such as reading clubs, social networking sites (e.g. LinkedIn,	Moderately participation rate at low frequency. Medium cost and medium benefit perceptions. Low to	Activities described: Membership in one or multiple professional associations.

	Facebook), discussion groups, and similar types of social resource groups through which your knowledge of museum teaching practice is enhanced informally through discussion or resource sharing."	moderate employer support, often in the form of financial/schedule accommodation.	Access to both social (e.g., special interest sub-groups) and material resources (e.g., newsletters, reports) were described.
Mentorship	"This category includes job shadowing, observing, modelling, or directly seeking practice advice/feedback from experts or more advanced peers."	Low participation rate at moderate frequency. Low financial cost but high time and energy cost perceptions; high benefit perceptions. Least frequently supported activity by employers. Participation was strongly correlated with Employer Support.	Activities described: Peer coaching and evaluation, observation, peer teaching, expert advice. Comments suggested a preference for non-hierarchical mentorship relationships. Experts may be sought for advice but were typically described as peers.
Peer Conversations	N/A	N/A	Activities described: Brain-picking, debriefing, casual conversation, and deliberate meetings. Often described in combination with other activities.
Teacher-Teacher Self-reflection	"This category includes journaling, critical reflection, and similar activities focusing on personal introspection of your teaching attitudes or approaches."	Moderate participation at moderate frequency. Minimal financial but medium time and energy cost perceptions; low benefit to job advancement, high	Activities described: Reflection through contemplation, reflection through conversation. Despite fewer direct comments for this activity than for other activities,

		other benefit perceptions. Low employer support. Strong positive correlation between participation and Employer Support.	participants appeared generally self aware.
Self-assessment	"This category includes activities in which you attempt to objectively evaluate your teaching practice. For example, by reviewing video recordings of your lessons, or by comparing your knowledge or behaviours against checklist, rubric, or scorecard (either created by you or using an established template)."	Low participation rate at low frequency. Minimal financial cost, but high time and energy cost perceptions; low benefit perception for job advancement but medium other benefit perceptions. Low employer support. Strong positive correlation between participation and Employer Support.	Activities described: Peer evaluation, personal knowledge gap assessment. Often tied with program development activities, comments suggest this type of activity is not uncommon.
Teacher-Student Post-visit Feedback	"This category includes collecting and reviewing visitor/volunteer response to their learning encounter (e.g. satisfaction surveys, verbal comments), in order to monitor your teaching practice or program designs."	High participation rate at high frequency. Minimal financial cost and moderate time and energy cost perceptions; moderate benefit perceptions. Low perception of benefit to job security/ advancement. High level of employer support. Strong positive correlation between participation and Employer Support.	Activities described: Conversations, second hand (e.g., from docents), observing. A very common activity among participants, both observational and anecdotal feedback techniques were described.

Praxis	This category includes testing out new techniques and adjusting your teaching strategies based on how students/visitors are responding to the experience, and then using results from these modifications to continually refine your teaching philosophy or approach to museum teaching.	Moderate participation rate at moderate frequency. Minimal financial cost but high time and energy cost perceptions; high benefit perceptions with exception of Job Security/Advancement. Moderate level of employer support. Moderate correlation between participation and Employer Support.	Activities described: Talking and interacting with learners, reframing. Docents who were former school-teachers were often seen as expert resources for museum educator learning.
Teacher-Content Self-study/Online	This category includes self-paced courses, lectures/webinars, and similar formats which maximize attention on the subject matter while minimizing interaction between classmates or the instructor.	Moderate participation rate at low frequency. Low financial cost but high time cost perceptions; medium benefit perceptions. Moderate employer support.	Activities described: Webinars, online research, video, first-hand experience, distance education, association learning programs, lectures. Accessibility and affordability were strong motivators for using online resources.
Professional Reading	This category includes reviewing scholarly papers or topical books, watching instructional videos or documentaries, or listening to podcasts or other audio recordings.	High participation rate at high frequency. Low financial but medium time and energy cost perceptions; medium benefit perceptions. Moderate employer support.	Activities described: Blogs, industry magazines, e-newsletters, books, association resources, book clubs, online resources and research. Sometimes used as part of a larger learning cycle, rather than as a stand-alone activity.
Self-directed Investigations	This category includes activities in	High participation rate at moderate	Activities described: Visitations, online

	which you independently seek, review, and reflect on multiple learning resources related to a single teaching issue or knowledge gap you are currently facing. These activities may be spontaneous or may involve articulating specific learning goals, strategies, or deadlines ahead of time.	frequency. Low financial cost but medium time and energy cost perceptions; medium benefit perceptions. Moderate employer support.	resources, human resources, critical analysis. Participants frequently used a combination of strategies (e.g., webinars plus casual discussion) in addressing a practice question/issue.

Appendix G

Budget

This research project required the following financial resources:

- Reach Conferencing: $0 additional cost
- SPSS software: $0 additional cost
- NVivo software: $183 CAD
- Participation incentive: 2 Visa Gift Cards x $50 CAD

Total budget: $283

Research grant funding to offset the above expenses was secured through the Athabasca University Graduate Student Research Fund.

Appendix H

Museum Communities of Practice

The following professional groups and institutions were contacted for assistance in communicating a call for volunteers for this study among their members, staff, or extended networks.

Group Name	Contacted	Confirmed
Canadian Heritage Information Network	✓	✓
Alberta Museum Association	✓	✓
Annapolis Royal Historic Gardens	✓	
Art Gallery of Montreal	✓	
Assiniboine Park	✓	
Association Heritage New Brunswick	✓	
BC Museum Association	✓	✓
Beatty Biodiversity Museum	✓	✓
Butchart Gardens	✓	
Canadian Art Gallery Educators	✓	
Canadian Association of Science Centres	✓	✓
Canadian Association of Zoos and Aquariums	✓	✓
Canadian Botanical Association	✓	
Canadian Educational Researchers' Association's Special Interest	✓	✓
Canadian Museum of History & National War Museum	✓	✓
Capital Museum Professionals Network (CMPN)	✓	✓
Community Museums Association of PEI	✓	✓
Devonian Botanic Garden	✓	✓
Group of Ontario Emerging Museum Professionals (GOEMP)	✓	✓
Hamilton-Area Museum Educators (HME)	✓	✓
Interpretation Canada	✓	✓
Inuit Heritage Trust (Nunavut)	✓	
Living Prairie Museum	✓	
Manitoba Museum	✓	✓
Manitoba Museum Association	✓	✓
Museum and Art Gallery Educators Collective of Durham (MAGEC)	✓	✓
Museum Education Monitor	✓	✓
National Gallery of Canada	✓	✓
NL Museum Association	✓	✓
Northwest Territories	NA	
Nova Scotia Museum Association	✓	✓
Ontario Museum Association	✓	✓
Ontario Science Centre	✓	✓
Parks Canada	✓	✓

Quebec Museum Association	✓	
Ripley's Aquarium	✓	✓
Royal Botanical Gardens	✓	✓
Royal Ontario Museum	✓	✓
Royal Tyrrell Museum	✓	
Saskatchewan Museum Association	✓	✓
Space for Life (Biodome, Insectarium, Botanical Garden,	✓	✓
Toronto Botanical Garden	✓	
Toronto Museum Educators' networking group (they need a name!)	✓	✓
Toronto Zoo	✓	
Vancouver Aquarium	✓	✓
Vancouver Art Gallery	✓	✓
VanDusen Botanical Garden	✓	
Yukon Museum Association	✓	✓

Appendix I

Letter of Information

Individual and institutional factors affecting the professional development activities of Canadian museum educators

DATE

Principal Investigator (Researcher):
Chett Bradley
chettb@yahoo.com

Supervisor:
Dr. Debra Hoven
debrah@athabascau.ca

You are invited to take part in a research project entitled 'Individual and institutional factors affecting the professional development activities of Canadian museum educators'.

This form is part of the process of informed consent. The information presented should give you the basic idea of what this research is about and what your participation will involve, should you choose to participate. It also describes your right to withdraw from the project. In order to decide whether you wish to participate in this research project, you should understand enough about its risks, benefits and what it requires of you to be able to make an informed decision. This is the informed consent process. Take time to read this carefully as it is important that you understand the information given to you. Please contact the principal investigator, Chett Bradley if you have any questions about the project or would like more information before you consent to participate.

It is entirely up to you whether or not you take part in this research. If you choose not to take part, or if you decide to withdraw from the research once it has started, there will be no negative consequences for you now, or in the future.

Introduction

My name is Chett Bradley and I am a Master of Education student at Athabasca University. As a requirement to complete my degree, I am conducting a research project about the perceptions, motivations, and decision-making processes of Canadian museum educators with regard to their professional development activities. I am conducting this project under the supervision of Dr. Debra Hoven.

Why are you being asked to take part in this research project?

You are being invited to participate in this project because of your educational leadership role within a Canadian museum, art gallery, zoo, science centre, botanical garden, national/provincial park, or similar not-for-profit community-oriented institution dedicated to the conservation, research, and promotion of cultural, historical, or natural heritage. For the purposes of this study, eligible participants have decision-making authority over the design or delivery of programming aimed at fostering visitor or community learning. Participants may or may not be members of staff at their institution.

What is the purpose of this research project?

The purpose of this study is to clarify how perceptions of personal investment, institutional support, and personal interest contribute to Canadian museum educators' decisions to pursue various forms of ongoing professional learning.

What will you be asked to do?

This study includes a survey component and an interview component. You may choose to participate in one or both of these components.

As a participant of this study, you are asked to complete a one-time, online survey (required time: approximately 10 minutes) at any time convenient to you between October 24, 2016 and November 13, 2016. By default, your survey responses will be anonymous. However, if you are willing to participate in the interview component of this study, you will be asked to provide a contact telephone number or email address at the end of the survey. As a result, if you choose to be interviewed your survey will no longer be anonymous.

Interviews will take place by telephone and will be arranged at a date and time that is convenient for your schedule (required time: approximately 15 minutes) between November 15, 2016 and November 30, 2016. Your interview will be recorded and transcribed, and you will be asked to confirm the accuracy of the interview transcript and any preliminary interpretations by email.

What are the risks and benefits?

Some questions in the survey and interview will ask you to describe your perceptions or experiences of employer support for your ongoing professional learning. Because of this, it is expected that museum employers may have interest in the study findings. All anecdotes arising from the interviews will be published in anonymized form, however due to the small number of institutions of certain museum types in Canada it is possible that a museum employer may suspect or recognize details of their institution being described. Every effort will be taken to ensure that potentially identifiable personal and institutional details will be withheld or anonymized prior to publication.

The results of this study can be used to support local advocacy efforts and the development of relevant professional development resources, decision-making tools, or programs for museum educators. Results may also help to inform future research related to teaching theory and practice.

Participants of the survey component will have the option to be entered into a draw for a $50 VISA gift card to be drawn on November 14, 2016. Participants of the interview component will have the option to be entered into a second draw for a $50 VISA gift card to be drawn on December 1, 2016.

Do you have to take part in this project?

As stated earlier in this letter, involvement in this project is entirely voluntary. Due to the anonymous nature of the survey, once your survey responses have been submitted they cannot be withdrawn unless you indicated your willingness to be interviewed and provided your contact

details at the end of the survey. Survey participants who provided their contact information with their survey responses that no longer wish to participate and wish to withdraw their responses may contact Chett Bradley on or before November 13, 2016.

Interview participants who no longer wish to participate and wish to withdraw their responses may contact Chett Bradley on or before November 30, 2016.

How will your privacy and confidentiality be protected?

All information will be held confidential, except when legislation or a professional code of conduct requires that it be reported.

Only the principal investigator and the research supervisor will have access to the research data. All study documents will be kept on a private, password protected hard drive accessible only to the principal investigator. No printed versions of the study data are expected to be produced.

How will my anonymity be protected?

Every reasonable effort will be made to ensure your anonymity; you will not be identified in publications without your explicit permission.

Survey results will be analysed and reported in aggregate form only. If you provided your contact information with your survey response, this information will be removed prior to data analysis and will not be publicly disclosed.

All interview transcripts will be anonymized of personally or institutionally identifying details upon receiving confirmation from the participant of the transcript's accuracy.

How will the data collected be stored?

All original study data, including survey response records and interview transcripts, will be anonymized and migrated to an off-line, password-protected private database for a duration of 5 years following submission of the final study report to Athabasca University. During this time, only myself (the primary researcher) and my supervisor will have access to the original study data. After 5 years, all study data will be destroyed.

If you provided your contact details with your survey responses, this information will be removed and held separate until completion of the second prize draw on December 1, 2016. After this date, all submitted contact information will be destroyed.

Secondary use of this data in later research projects is not anticipated.

Who will receive the results of the research project?

Aggregate or anonymized study data will be included in the final research paper to Athabasca University. The existence of the research will be listed in an abstract posted online at the Athabasca University Library's Digital Thesis and Project Room, and a full-text version of

the final research paper will also be publicly available through this channel.

Study data may also appear in aggregate or anonymized form in academic presentations, posters, or papers related to this study. Dissemination of study findings may be pursued through scholarly outlets including, but not limited to, conferences and academic journals related to the fields of community education, distance education, museum education, and professional education.

Who can you contact for more information or to indicate your interest in participating in the research project?

Thank you for considering this invitation. If you have any questions or would like more information, please contact me, (the principal investigator) by e-mail at chettb@yahoo.com or my supervisor by email at debrah@athabascau.ca or by telephone at 1 866-441-5517. If you are ready to participate in this project, please proceed to review the following consent and complete the survey.

Thank you.

Chett Bradley

This project has been reviewed by the Athabasca University Research Ethics Board. Should you have any comments or concerns regarding your treatment as a participant in this project, please contact the Research Ethics Office by e-mail at rebsec@athabascau.ca or by telephone at 1-800-788-9041, ext. 6718.

Appendix J

Recruitment Poster Template

PARTICIPANTS NEEDED FOR
RESEARCH IN MUSEUM EDUCATOR PROFESSIONAL LEARNING

We are looking for volunteers to take part in a study of the professional development patterns of Canadian museum educators.

As a participant in this study, you would be asked to fill in an online survey questionnaire. Survey participants may also choose to be contacted for a follow-up telephone interview.

Your participation is **entirely voluntary** and survey completion would take up approximately 10 minutes of your time. Telephone interviews will also take up approximately 15 minutes of your time, and will be held between November 15 and November 30, 2016. By participating in this study you will help us to better understand the factors that impact Canadian museum educators in their pursuit of lifelong learning.

In appreciation for your time, survey participants will be entered to win a $50 Visa gift card. Participants selected for interview will be entered to win a further $50 Visa gift card. Draws will take place on November 14 and December 1, 2016.

To learn more about this study, or to participate in this study,
please click the link below:

https://rsurvey.athabascau.ca/limesurvey/index.php?sid=71479&lang=en

Principal Investigator:
Chett Bradley
chettb@yahoo.com

This study is supervised by:

Dr. Debra Hoven
1 866-441-5517
debrah@athabascau.ca

This study has been reviewed by the Athabasca University Research Ethics Board.

Appendix K

Ethical Approval and Renewal

Athabasca University
RESEARCH CENTRE

CERTIFICATION OF ETHICAL APPROVAL

The Athabasca University Research Ethics Board (AUREB) has reviewed and approved the research project noted below. The AUREB is constituted and operates in accordance with the current version of the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (TCPS) and Athabasca University Policy and Procedures.

Ethics File No.: **22332**

Principal Investigator:
Mr. Chett Bradley, Graduate Student
Centre for Distance Education\Master of Education in Distance Education

Supervisor:
Dr. Debra Hoven (Supervisor)

Project Title:
Individual and institutional factors affecting the professional development activities of Canadian museum educators

Effective Date: October 20, 2016 **Expiry Date**: October 19, 2017

Restrictions:

Any modification or amendment to the approved research must be submitted to the AUREB for approval.

Ethical approval is valid *for a period of one year*. An annual request for renewal must be submitted and approved by the above expiry date if a project is ongoing beyond one year.

A Project Completion (Final) Report must be submitted when the research is complete *(i.e. all participant contact and data collection is concluded, no follow-up with participants is anticipated and findings have been made available/provided to participants (if applicable))* or the research is terminated.

Approved by: **Date:** October 20, 2016

Susan Moisey, Acting Chair
Centre for Distance Education, Departmental Ethics Review Committee

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Athabasca University Research Ethics Board
University Research Services, Research Centre
1 University Drive, Athabasca AB Canada T9S 3A3
E-mail rebsec@athabascau.ca
Telephone: 780.675.6718

Athabasca University
RESEARCH CENTRE

CERTIFICATION OF ETHICAL APPROVAL - RENEWAL

The Athabasca University Research Ethics Board (AUREB) has reviewed and approved the research project noted below. The AUREB is constituted and operates in accordance with the current version of the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (TCPS) and Athabasca University Policy and Procedures.

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Mr. Chett Bradley, Graduate Student
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Approved by: **Date:** October 20, 2017

Joy Fraser, Chair
Athabasca University Research Ethics Board

Athabasca University Research Ethics Board
University Research Services, Research Centre
1 University Drive, Athabasca AB Canada T9S 3A3
E-mail rebsec@athabascau.ca
Telephone: 780.675.6718