EXPERIENTIAL LEARNING IN UNDERGRADUATE PHARMACY CURRICULUM: A CASE STUDY OF CO-OPERATIVE EXPERIENCE OF PHARMACY STUDENTS

by

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A thesis submitted in conformity with the requirements for the degree of Doctor of Philosophy
Department of Curriculum, Teaching and Learning
Ontario Institute for Studies in Education
University of Toronto

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Abstract

This research study explores the co-operative experience of undergraduate pharmacy students with a focus on its influence on the students’ professional and personal development. The data was collected through semi-structured interviews and focus groups with 19 pharmacy students from the first graduating class in this program, 12 co-op employers, and 12 faculty members. The impact of experiential learning on the professional and personal development of undergraduate pharmacy students during their co-op experiences was multi-dimensional. While students believed that they gained self-confidence and achieved self-discovery and career-related discovery after their co-op placements, their professional and personal development could be driven by their own motivation and personality. Co-op employers and the co-op sites did play a role in influencing students’ individual development. Despite the unstructured and inconsistent nature of co-op, it was evident that co-op offered students the opportunity to explore the diversity of the pharmacy profession. Students should take ownership of their learning and faculty should supplement students’ learning by using teaching moments at school to reinforce and re-align the knowledge and skills acquired in the classroom and those gained during real-world practice.
Based on my research, I was able to propose a model of co-op experience integrated in the four stages of Kolb’s experiential learning cycle. I concluded that a hybrid of both structured and unstructured experiential learning for pharmacy students might be an ideal curricular model.
Acknowledgments

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My dissertation would not be possible without the support from my friends and colleagues at the Leslie Dan Faculty of Pharmacy, University of Toronto, and the Institute for Safe Medication Practices Canada. They have kindly covered my work responsibilities when I took time off to complete my dissertation.

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Chapter 1
Introduction

1.1 Background

As a practicing pharmacist in Ontario for almost 20 years, I have observed and experienced several key changes in the profession. First, pharmacy is no longer a product-oriented occupation. Pharmacists need to embrace and practice patient-centred care. In other words, we need to communicate, have dialogues with our patients and their caregivers, before we can make any clinically relevant decisions for the best of their care. We can no longer hide or stay behind the high-dispensing counter in the pharmacy. In fact, in most pharmacies today, the physical barriers are removed and patients can easily access and speak with the pharmacy staff in the dispensary. Private patient counselling areas or consultation rooms that are separated from the dispensing area can be found in a lot of pharmacies in order to facilitate pharmacist-patient interactions.

Secondly, pharmacists, when executing their full scope of practice, are stepping out of their silos. They are now collaborating interprofessionally with prescribers, such as family physicians and nurse practitioners, to monitor their patients’ medical conditions by, for instance, making recommendations or therapeutic substitutions for optimal medication therapy management, ordering laboratory work for patients, and prescribing for minor ailments in some provinces in Canada. Many pharmacists are now trained and certified to give immunization to patients. Their expanded skills and scope of practice have proven to be a significant contribution to the Canadian health care system, especially in the promotion and administration of the influenza vaccines to citizens during the flu season.
Last but not least, pharmacists are not limited to practice in the community or hospitals. Their career options can be quite versatile, ranging from being a frontline primary care clinician, an educator in a post-secondary institution, to an entrepreneur, or an analyst or informatics specialist in a pharmaceutical company or an institution, just to name a few. Nevertheless, pharmacy remains a self-regulated profession. Regardless of where a pharmacist practices, there is always a provincial or territorial regulatory body that sets the standards of practice and governs the self-regulation of the profession. In other words, pharmacists practice according to the standards of practice.

Similarly, pharmacy students, in order to be educated and be ready for entry-to-practice, must also meet a list of educational outcomes and professional competencies that are corresponding to the current standards of practice of the profession. To cope with the evolution of the profession, it is not surprising to see significant changes in the undergraduate pharmacy curriculum in Canada, especially in the past 10 years.

1.2 Purpose of my Research

Pharmacy has evolved from a dispensing or product-focused to a patient-oriented health care profession over the last decade. The educational outcomes and professional competencies that were expected from pharmacy graduates at entry-to-practice were traditionally measured by in-class exams and skills labs during the students’ academic semesters. With the expanded scope of practice in pharmacy in recent years, it is important to ensure that training of new graduates in this profession is well-balanced in both clinical and interpersonal skills through in-class and real-world practice.

The concept of co-op experiential learning in Canadian undergraduate pharmacy program was relatively new in Canada. The first pharmacy co-op program in Canada was founded in 2007.
and students were admitted to the program in 2008. Little research had been done on co-op experiential learning in undergraduate pharmacy schools.

My research explores the co-operative (co-op) learning experience of undergraduate pharmacy students in Ontario, Canada, with a focus on its influence on the students’ professional and personal development.

1.3 Significance of the Research

At the beginning of the 20th century, there were no requirements for pharmacists to obtain neither an educational degree nor experiential training prior to practice (Cox, 2012). Currently, in the United States, experiential programs make up more than one-third of most pharmacy curriculums (Cox, 2012). Since pharmacists are now expected to be good communicators and collaborators with patients and other health care professionals, it is obvious that more and earlier exposure for students to real-world pharmacy practice, while they are still in school, is necessary to better prepare and equip them for entry-to-practice.

Today, the undergraduate pharmacy curriculum was quite different from 20 years ago. Students have expanded opportunities to gain hands-on, practice-based, and even real-life experiences in pharmacy practice prior to graduation. At the same time, our scope of practice has expanded and evolved from a product-focused to a patient-oriented health care profession over the past 10 years.

While co-op experiential learning in higher education or structured experiential education in pharmacy or other health care professional training is not uncommon, the concept of co-op education, integrated throughout a four-year Bachelor of Science in Pharmacy (BScPhm) program in an undergraduate pharmacy curriculum is a relatively new and unique concept in Canada. My research is based on first-hand knowledge and experience from the first graduating
class of students from the only undergraduate pharmacy program in Canada that incorporates a co-op component.

Interestingly, my study could potentially be the first attempt to explore and report on the undergraduate pharmacy co-op phenomenon in Canada. One might critique that my background and my prior learning experience and practice might bias the interpretations and findings in my study; yet, I would argue that if this is meant to be first-hand information and experience from the first graduating class of students from the only undergraduate pharmacy program in Canada that offers a co-op component, then what could be better than being captured by an “insider” who was once a pharmacy student, and now a practicing pharmacist, and a pharmacy educator.

The findings from this case study will add to our understanding of the efficacy, challenges and barriers of incorporating experiential learning within pharmacy curricula in the Canadian context. Though not generalizable, the findings will inform pharmacy curricula in the future.

1.4 Background of the Researcher

I grew up in a traditional Chinese family in Hong Kong. My parents basically made most decisions for me for my first 15 years of life. By the time we reached Form 3, which was equivalent to Grade 9 in Canada, most students were required to make a choice between the arts and the sciences streams in the curriculum. I simply asked my father who suggested that I chose the sciences stream. I never gave a second thought to why I chose sciences back then, as it was typical in the Chinese culture for parents in the 1980s to make such decisions for their children with respect to education. I finished my secondary education (equivalent to Grade 11) in Hong Kong and then immigrated to Toronto, Canada, with my parents.
I still remember that the counsellor at the high school I attended for one year in Toronto asked me about the courses that I would like to take for Grade 12. I did not have any idea and simply let the counsellor choose the courses for me. In fact, due to the limited types of courses that I had taken in the sciences stream secondary school in Hong Kong, I eventually took primarily mathematics and sciences courses in my one-year high school education in Canada.

My four-year undergraduate pharmacy education was uneventful, as I was a typical pharmacy student who spent most of my time studying at home and who participated in limited extracurricular activities. In hindsight, I believed I have missed having a lot of fun, attending interesting events, and taking advantage of other opportunities with my peers on campus.

In essence, in the first 25 years of my life, I was very used to having things arranged for me and I was satisfied with undergoing a structured educational program, likely because I had little else against which to compare with and I believed that this was the norm. It was not until I graduated and had the opportunity to work in different practice settings as a pharmacist that I realized my visual field with respect to pharmacy education and pharmacy practice was quite narrow.

I was very fortunate to have the opportunity in the past 20 years to work in various community pharmacies, a national corporate office of a pharmacy chain, a provincial pharmacy association, a provincial regulatory body of pharmacists and pharmacies, and recently in higher education for the training of new pharmacy graduates. This experience did open my eyes to the versatility of the profession. Of all these pharmacy practice experiences, I found that I was most happy and I truly enjoyed my time when I was interacting with my pharmacy students.

I have been a part-time pharmacy educator with undergraduate pharmacy training in Ontario since 2008. What current pharmacy students go through are quite different from what I underwent in the 1990s. The undergraduate pharmacy curriculum in the early 1990s was very
structured. The traditional undergraduate pharmacy curriculum that I went through had a strong emphasis on students’ clinical knowledge and skills. It included limited experiential components that took place primarily during the last or the fourth year of the program. Although I did work part-time at a community pharmacy during school in the second, third, and fourth year of the curriculum, my responsibilities were mainly technical duties similar to tasks that would be assigned to a pharmacy assistant.

I believe that the 32-week studentship and 16-week internship that were mandatory components for licensure in Ontario, Canada, afforded me most of the hands-on and practice-based learning opportunities I had before getting licensed. The studentship and internship were structured and overseen by the Ontario College of Pharmacists, the registering and regulating body for the profession of pharmacy in the province of Ontario, and they were not part of the academic requirements of my four-year BScPhm program.

There were some modifications of the pharmacy curriculum several years after I graduated. Although more practical components were introduced to the BScPhm program, such real-life exposure for students in pharmacy practice, typically with the majority of the practice-experience hours scheduled immediately prior to graduation, the program remained very structured and centrally administered and monitored by the faculty.

From 2008 to 2014, I was one of the adjunct faculty members at the UW School of Pharmacy. My teaching responsibilities included the delivery of lectures in the areas of drug information, evidence-based medicine, and medication safety. I was at an arm’s length from the experiential program where the co-op component of the BScPhm curriculum was administered. Owing to my own experience as a student in a traditional pharmacy program with real-life exposures or opportunities to pharmacy practice mainly occurred at the end or the last year of the curriculum, I was very much fascinated by the variety and versatility of the co-op experiential
components that were integrated throughout the four-year pharmacy program at the UW (Figure 1). As a graduate from a pharmacy program in Canada that did not offer a co-op component, in hindsight, having early exposure to the real-world pharmacy practice or the various workplace settings in the profession would definitely be beneficial not only to the students’ clinical skills development, but also to their personal growth in multiple dimensions and their career planning.

Being a part-time adjunct teaching faculty at the University of Waterloo (UW) School of Pharmacy, I observed the change in behavior and confidence in students before and after their co-op work terms over the past few years. Focusing my doctoral dissertation on a case study of the co-op experience of the first graduating class of pharmacy students at the UW was a valuable opportunity for me to learn more about the influence of co-op experiential learning, in particular, on pharmacy students’ professional and personal development.

Furthermore, based on Guba and Lincoln’s (2005) alternative inquiry paradigms, my approach to this research study fit into the philosophical stance of constructivism where multiple perspectives from different participants (that is, pharmacy students, co-op employers, faculty members) were taken into consideration for the ultimate interpretation and, if possible, the generation of theory. My understanding and my current and past experience in the field of pharmacy was intertwined with constructions and reconstructions of participants’ views. Trustworthiness and authenticity were considered as the quality criteria for this study (Guba & Lincoln, 2005).

However, I do have to acknowledge or disclose that my constructivist lens in this study came with a caveat. My prior learning experience in pharmacy school and my practice as a pharmacist in the last 20 years are surrounded by pre-defined and pre-conceived notions of educational and professional competencies as well as the standards of practice set by the provincial regulatory body of pharmacists. In other words, the worldviews of positivism and
post-positivism are rooted in my previous years of schooling and professional practice in pharmacy where evidence and objectivity are essential for knowledge inquiry and knowledge claims (Creswell, 2003). Another caution that I need to take is that, as a pharmacist, I was trained in basic, natural, and clinical sciences in my undergraduate education, so I have the tendency to consider quantitative research, which is more familiar to me (Anderson, 2010), but unfortunately, not too appropriate for studying the co-op experience of pharmacy students in this case.

Overall, since my research was likely the first exploratory study in the field of co-op experiential learning in undergraduate pharmacy programs in Canada, it was relatively more appropriate to be open-minded and be considerate of what could be informed or learned through a constructivist lens. Essentially, in order to fully explore, understand, and interpret the stories and rich narratives of the pharmacy students’ co-op experience in my research, I have been constantly reminding myself to be nonjudgmental, broad-minded, and aligned with the constructivist stance throughout the planning and implementation of my research and analysis of my findings to the best of my ability.

1.5 The School of Pharmacy at the University of Waterloo

The School of Pharmacy at the University of Waterloo (UW) in Ontario, Canada, was founded in January 2007. It is currently the only undergraduate program among the 10 faculties and schools of pharmacy in Canada that comprises a co-op component in its curriculum (About the School of Pharmacy, n.d.). Hence, blinding the name of the school in my dissertation is not necessary.

The findings presented in my dissertation were based on my viewpoints and did not represent the view of the UW School of Pharmacy. In addition, I received administrative consent
from the Hallman Director and Professor of the UW School of Pharmacy to conduct my research (Appendix A).

The UW School of Pharmacy BScPhm program consisted of four mandatory 16-week experiential co-op work terms that are integrated throughout the four-year curriculum (Figure 1).

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
</tr>
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<tbody>
<tr>
<td>AT (Jan to Apr)</td>
<td>AT (May to Aug)</td>
<td>WT1 (Sep to Dec)</td>
<td>AT (Jan to Apr)</td>
</tr>
<tr>
<td>AT (May to Aug)</td>
<td>AT (May to Aug)</td>
<td>WT2 (Sep to Dec)</td>
<td>AT (May to Aug)</td>
</tr>
<tr>
<td>AT (Jan to Apr)</td>
<td>AT (May to Aug)</td>
<td>WT3 (Sep to Dec)</td>
<td>AT (Jan to Apr)</td>
</tr>
<tr>
<td>AT (May to Aug)</td>
<td>AT (May to Aug)</td>
<td>WT4 (Sep to Dec)</td>
<td>AT (May to Aug)</td>
</tr>
</tbody>
</table>

AT = Academic Terms
WT = Work Terms

Figure 1. Distribution of academic terms (AT) and co-op or work terms (WT) in the undergraduate pharmacy curriculum at the University of Waterloo

Typically, all co-op programs at the UW are centrally managed by the Co-operative Education and Career Services (CECS) office. During the co-op or work terms, UW students serve as paid employees for their employers. Subsequently, at the completion of a work term, students are expected to submit a work report to the CECS field coordinator in order to receive a work-term credit (Co-op student manual work reports, n.d.). In essence, the work report is a documentation of the work and experience that the student has acquired during the work term. However, at times, the link between the learning and training during the academic terms and the work terms may not correspond, depending on the job placements of the students. As a result, when the School of Pharmacy was established, a proposal was made to CECS to take into account the fact that for undergraduate pharmacy training, a number of practice-based competencies that are congruent with the standards of practice are necessary to be achieved by
the students upon graduation. As such, the co-op component of the UW BScPhm program is mainly administered directly by the School of Pharmacy, with support from the CECS.

Within the pharmacy profession, there are a number of existing documents that outline the expected pharmacy educational outcomes and professional competencies at entry-to-practice, such as, the *Accreditation Standards for the First Professional Degree in Pharmacy Programs* from the Canadian Council for Accreditation of Pharmacy Programs (CCAPP, 2013), the *Association of Faculties of Pharmacy in Canada (AFPC) Educational Outcomes for First Professional Degree Programs in Pharmacy (Entry-to-Practice Pharmacy Programs) in Canada* (AFPC, 2010), the *National Association of Pharmacy Regulatory Authorities (NAPRA) Professional Competencies for Canadian Pharmacists at Entry to Practice* (NAPRA, 2007), and the *Structured Practical Training Studentship/Internship Competencies* from the Ontario College of Pharmacists (OCP, n.d.), which is the registering and regulating body for pharmacists in the province of Ontario, Canada.

Consequently, it is critical to have not only documentation (such as the student work report), but also some sort of assessment within the co-op component to serve as evidence to support the accomplishment of all the necessary learning outcomes and practice-based competencies. Of the above competency documents, the UW School of Pharmacy Professional Learning Outcome Tracker (PLOT) was primarily based on the AFPC and NAPRA education outcomes and professional competencies. In fact, the *AFPC Educational Outcomes for First Professional Degree Programs in Pharmacy (Entry-to-Practice Pharmacy Programs) in Canada* (AFPC, 2010) was the core document for accreditation purposes of this new pharmacy program at the UW upon the first graduating class of students in August 2011.
1.5.1 Professional Learning Outcome Tracker (PLOT)

The PLOT was a documentation tool for students to track their learning outcomes throughout their four mandatory co-op work terms at the UW School of Pharmacy. It was developed and implemented in the fall semester of 2008 when the very first co-op work term took place for the first admitted class of students in the BScPhm program. The PLOT presented a very comprehensive and well-defined framework for the learning outcomes and competency elements (with practical examples provided) that students needed to address and achieve upon graduation and at entry-to-practice of the pharmacy profession. It consisted of four main constructs – patient care; drug distribution; drug information, education, and health promotion; and management and leadership in pharmacy practice.

The PLOT also served as a tool to facilitate student’s self-assessment (with practical examples or evidence extracted from student’s work report or experience log that was maintained by the student throughout the work term), employer’s assessment (again with employer’s comments and practical examples or situations observed by the employer), and also student’s revised self-rating with rationale after discussion with the employer. Throughout the work term, the student and the employer were encouraged to discuss their PLOT ratings and experience. Submission of the PLOT to the School of Pharmacy at the end of the work term was required for students to receive the work-term credit.

The Ontario College of Pharmacists recently adopted the NAPRA Model Standards of Practice (MSOP) for Canadian Pharmacists (2009) in January 2010. This document stated four main standards: expertise in medications and medication-use; collaboration; safety and quality; and professionalism and ethics. The students’ documentation in the PLOT might not necessarily capture an all-round picture of skills development and acquisition during their co-op experience.
in preparation for their entry-to-practice to the pharmacy profession. In particular, the constructs of collaboration, professionalism and ethics were not explicitly or easily measured in a classroom setting, nor addressed in the documentation and self-assessment in the PLOT.

In other words, since day one, both faculty and students in a pharmacy program, like any other health profession programs, were already aware of the educational outcomes and professional competencies that were expected for students to accomplish upon graduation. The NAPRA MSOP for Canadian Pharmacists (2009) and the PLOT constructs were pre-defined and pre-conceived goals for pharmacy students at the UW. The students’ clinical and therapeutic knowledge and skills were, by default, measured and captured by the school’s assessments. However, the students’ four, 16-week co-op work terms included rich stories and narratives of their own, individual development and experience – personally, interpersonally, and professionally. Hence, while exploring the cooperative experience of pharmacy students, I specifically aimed at exploring how co-op experiential learning influenced students’ professional and personal development in my research.

Traditionally, when a new program or discipline was introduced to an institution of higher education, the focus would primarily be on how the new program aligned with the curricular requirements, or, in this case, the accreditation of the new pharmacy undergraduate program as per the AFPC Educational Outcomes for First Professional Degree Programs in Pharmacy (Entry-to-Practice Pharmacy Programs) in Canada (AFPC, 2010). As illustrated in the four main constructs of the PLOT, the tracking or documentation of the new pharmacy program at UW placed an emphasis on the development of students’ therapeutic knowledge, clinical skills, and medication-use expertise. Yet, I believe that education and advancement of students’ professional and personal development were equally as important as the training and performance of the scientific or therapeutic knowledge in the pharmacy discipline. The stories
and narratives of the students’ co-op experience should be able to inform me of the human development of their personal and professional aspects.

In addition, the primary interest of a co-op program, especially with a new undergraduate degree program seeking accreditation, was typically on its link to classroom teaching and learning, that is, how students applied, demonstrated, or transferred their learning from classroom to their co-op placement and vice versa. The notion of how co-op experiential learning influenced the students’ professional and personal behaviour or development – the research focus of my thesis – was unlikely of immediate priority and interest to the UW School of Pharmacy during the first round of delivery of the BScPhm curriculum between 2008 and 2011, but would be of value, perhaps, for the revision and fine-tuning of the curriculum in subsequent years of the program.

1.6 Research Questions

My thesis was a qualitative research study that examined the co-op learning component of the undergraduate pharmacy program at the University of Waterloo. I explored the following research questions:

1. How does co-op experiential learning influence the professional and personal development of undergraduate pharmacy students at the UW School of Pharmacy?

2. What are the perspectives of pharmacy students, co-op employers, and faculty members towards the impact of co-op experiential learning on students’ professional and personal development?

1.7 Theoretical Framework

Since the early 1980s, Kolb’s experiential learning theory has been adopted in various disciplines and professions, as it provides a model that integrates experience, reflection on
experience, educational theory and abstract concepts with ongoing practice and testing of
c Kenneth, 1984). Kolb’s four-stage experiential learning cycle is also
recognized as a guiding principle for training and continuing professional development. Kolb
perceived that experiential learning could nicely assimilate an individual’s education, work, and
personal development (Kolb, 1984). In Chapter 2, I illustrate how Kolb’s experiential learning
cycle can be applied to the co-op component of the UW School of Pharmacy curriculum.

In addition, Kolb’s experiential learning theory fits well in the philosophical stance of
constructivism, which is the worldview that I applied in my data collection and data analysis.
Therefore, Kolb’s four-stage experiential learning cycle is the theoretical framework for my
study and it also facilitates the analysis of my research findings.

1.8 Scope and Limitations of my Research

The scope of this study was limited to one class of students – the vanguard or the first
graduating class of students – who graduated in August 2011, in a pharmacy school in one
university, Ontario, Canada. Hence, the following limitations were expected with respect to the
interpretation of findings from this qualitative, exploratory descriptive case study.

My preconceptions and my previous experience of studying in a pharmacy school
without a co-op component, likely and unconsciously, shed some bias when I viewed the
comments from students, co-op employers, and faculty members in this study. Yet, after being in
the profession for almost 20 years and interacting with different pharmacy students and interns in
various work settings, I was very much aware and cautious during the interpretation of my
findings so as to increase my objectivity when constructing the pattern of information derived
from my data. In addition, I adopted several procedures in order to improve the trustworthiness
of my research, such as, triangulation, audit trails, and reflexivity, which I elaborate on in Chapter 3.

Since I was a part-time adjunct teaching faculty at the UW School of Pharmacy when I was conducting my research, I might know some of the participants, particularly, students, in this study. This clearly might impose some ethical implications to a certain degree and have a potential for perceived coercion. As a result, I arranged a research assistant (BM) to recruit and invite the student participants and to conduct the semi-structured interviews on my behalf.

It was assumed in my study that pharmacy students did develop some skills during their co-op work terms. Since this preconceived notion was directly associated with the validity and reliability of the data collected for my study, triangulation using data sources from co-op employers and faculty or teaching staff improved the trustworthiness and authenticity, and hence the quality of the final interpretation of my findings.

My research involved a purposive sample (Patton, 2002), that is, a selected class (or group) of 19 students from the first graduating class of the BScPhm program who graduated in August 2011 (often referred to as the Rx2011 class) and completed their four, 16-week co-op work terms at the time of my data collection. Without random sampling, my findings could not be generalized to the population of pharmacy students. However, this was the first cohort of students who underwent the only co-op experiential learning model in an undergraduate pharmacy curriculum among the 10 schools of pharmacy in Canada; there was potential value in looking at how this type of curriculum affected students’ professional and personal development. My research might find out more conditions or contexts that, perhaps, might contribute to Kolb’s experiential learning theory. Based on the data and findings generated, readers from the pharmacy profession might decide on the relevance of my study to their own environment or contexts.
In summary, my research was situated in the first and only undergraduate pharmacy program in Canada that consists of a co-op experiential curriculum. There was not any pre-existing benchmark or comparison available for this study. Instead, findings from my research would be able to serve as a baseline or proposal for future studies in this respect.

1.9 Brief Outline of my Dissertation

In Chapter 2, I describe my literature review with respect to experiential learning, co-op education in health and other professions as well as in undergraduate pharmacy curriculum, in particular, the limitations of studies in the Canadian context and the common themes generated from my literature search findings.

In Chapter 3, I explain my research design and methodology, my data analysis plan, and underlying assumptions and anticipated limitations of my study.

In Chapter 4, I present my data analysis and research findings, in addition to a description of the study site and participants in my study.

In Chapter 5, I address my research questions and present my research implications. In addition, based on my findings, I offer a proposed model of co-op experience, which illustrates the influence of co-op experiential learning on the professional and personal development of undergraduate pharmacy students. I conclude my dissertation with my suggested contribution to Kolb’s experiential learning theory and a brief note on recommendations for future research in experiential learning of undergraduate pharmacy students.
Chapter 2
Review of the Literature

2.1 Literature Search Strategy

With respect to the social sciences and educational literature, I searched the Education Resources Information Center (ERIC) database using the following keywords – constructivist theory, constructivism, cooperative education, higher education, experiential learning, student experience, student development, Kolb’s experiential learning cycle, professional education, pharmacy education, health profession education; and related authors’ searches on David A. Kolb and John Dewey. I also consulted the university librarian who assisted me to perform a search in the Canadian Business and Current Affairs (CBCA) Education database on co-op education, pharmacy, and health science.

In addition, I did a search in medical sciences related database, PubMed MEDLINE http://www.ncbi.nlm.nih.gov/sites/entrez, using the following Medical Subject Headings (MeSH terms) and text words respectively – pharmacy, pharmacy practice, health profession education, experiential learning. The university librarian also helped me perform searches in two other major biomedical and pharmaceutical databases – EMBASE (Excerpta Medica Database) and International Pharmaceutical Abstracts (IPA) database – on cooperative education.

With the above search strategies, I did not limit to any specific timeframe. This was due to the fact that the co-op model at the UW School of Pharmacy was the first and the only co-op pharmacy program in Canada (About the School of Pharmacy, n.d.). I decided to expand and cover my search beyond the scope of Canada or even North America.

As expected, the above searches did not yield any specific information pertaining to co-op experience in Canadian undergraduate pharmacy education. The closest match would be a
few studies in the United States, the United Kingdom, Finland, Australia, and Malaysia, which I elaborate on later in this chapter.

2.2 Experiential Learning

2.2.1 Experiential Education in Contrast to Experiential Learning

In the literature, it is not uncommon to find that experiential education is often being used interchangeably with experiential learning. However, for the purpose of my research, it is important to distinguish the subtlety of these two terms, as my focus was on the experiential learning of undergraduate pharmacy students. Itin (1999) provided a clear differentiation and stated that:

Experiential learning is best considered as the change in an individual that results from reflection on a direct experience and results in a new abstractions and applications. Experiential learning rests within the student and does not necessarily require a teacher. Experiential education will certainly seek to take advantage and maximize the opportunities for experiential learning. However, any definition of experiential education must include or make clear the transactive component between teacher and learner which is absent from the definition of experiential learning. (p. 92)

Within the realm of experiential education and/or experiential learning, the work by John Dewey at the beginning of the 20th century was of utmost importance. Essentially, Dewey set the cornerstone for a brand new perspective towards education and experience. Dewey (1929) first defined that education should be autonomous and it should also be iterative, that is, constantly involving the stage of problem-solving, learning, changing, yearning, and so on, in a non-stop, cyclical manner. Later, Dewey (1938) further emphasized and consolidated the relationship and the role of experience in education. In other words, experiential learning involved not only knowing the subject matter, but also the continuous cycle of understanding and reflecting on the acquired knowledge through the act of doing.
Winn (1959), in John Dewey: Dictionary of Education, summarized that “education may be defined as a process of continuous reconstruction of experience with the purpose of widening and deepening its social content, while, at the same time, the individual gains control of the methods involved” (p. 32) and also stated the following:

When we experience something we act upon it, we do something with it; then we suffer or undergo the consequences. We do something to the thing and then it does something to us in return: such is the peculiar combination. The connection of these two phases of experience measures the fruitfulness or value of the experience. Mere activity does not constitute experience. (p. 38)

The above echoed what Itin (1999) considered for learning – an individual experience. It also concurred with the interpretation of experiential learning, based on Chickering (1976) and Stehno (1986), which involved a continuous cycle of events within an individual, including “1) action that creates an experience, 2) reflection on the action and experience, 3) abstractions drawn from the reflection, and 4) application of the abstraction to a new experience or action” (p. 91).

Even if we traced back to the ancient Greek perspectives on experiential learning, Stonehouse, Allison, and Carr (2011) confirmed that “Aristotle as a progenitor of the experiential learning cycle [italics added]” (p. 18) and “in Aristotelian terms, experiential learning can create opportunities for students and educators to develop their phronesis [practical wisdom]” (p. 24).

2.2.2 Kolb’s Experiential Learning Theory

Kolb (1984) introduced the concept of a four-stage learning cycle in the early 1980s. Since then, this conceptual framework had been applied in various disciplines – business (Ahn, 2008), geography (Ives-Dewey, 2008), early childhood and adult education (Baptiste, 1996; Kreber, 2001), medicine (Maudsley & Strivens, 2000), as well as continuing professional development (Daley, 2000). Very often, Kolb’s experiential learning theory was referred to as
the standard model for training and continuing professional development. In essence, Kolb’s experiential learning model consolidated several concepts that were identified by previous researchers, like Vygotsky (1978) and Schön (1983), where students’ learning was dependent on personal experience, reflection on ones practice while the event is occurring, after it occurred, and for the purpose of planning for future actions, and taking into consideration of the human resources (peers, preceptors, or employers), social, and cultural context within the environment where experiential learning took place. Later, Moon (1999) also supported the fact that the quality of reflection was a significant element in student learning and professional development.

Experiential learning could be considered as a bridge that linked education, work, and personal development (Kolb, 1984). The adoption of Kolb’s experiential learning cycle in the co-op component of the UW School of Pharmacy curriculum was illustrated in Figure 2.

![Conceptual Model of Kolb’s experiential learning cycle incorporated into the co-op component of the UW School of Pharmacy Program (Kolb, 1984)](image-url)

*Figure 2. Conceptual Model of Kolb’s experiential learning cycle incorporated into the co-op component of the UW School of Pharmacy Program (Kolb, 1984)*
I made the assumption in my research that pharmacy students did achieve a certain
degree of skills development in each of their four, 16-week co-op work terms, and this
assumption was supported by Fletcher (1991) and Ting et al. (2009) where positive feedback
with respect to skill acquisition from pharmacy students was obtained after their first-year work-
based learning. Through the required completion of work report and reflection exercise by the
School of Pharmacy, students reflected on their practical experience (Stage 1) and experiential
learning during co-op (that is, Stage 2 – Reflection on experience). When students returned to
school in between co-op work terms, they shared their experience and discussed with their peers
and faculty members or prospective employers to further consolidate any theory or abstract
concepts that they had encountered during their experiential learning (that is, Stage 3 – Theory
and abstract concepts).

By the time students were ready for their next co-op work terms, they could then test and
apply new knowledge acquired in class and practice concepts that they had left off from previous
work terms for further development (that is, Stage 4 – Practice and testing of concepts). With
ongoing self-assessment and reflection, pharmacy students internally underwent iterations of
Kolb’s experiential learning cycle throughout their undergraduate training at the UW School of
Pharmacy, which would also well prepare them for their personal continuing professional
development and lifelong learning in their future pharmacy career.

Furthermore, Kolb’s experiential learning cycle was nicely incorporated within the
worldview of constructivism, as proposed by Baptiste (1996) and Daley (2000). A constructivist
view of experiential learning was made possible by integrating and connecting the contexts of
classroom teaching and learning, students’ co-op experience, and interdisciplinary professional
practice (Daley, 2000). Therefore, I perceived Kolb’s four-stage experiential learning cycle as
the theoretical framework for my study and the sensitizing concept to facilitate the analysis of my research findings.

2.3 Cooperative (Co-op) Education

Cooperative education implied not only work experience, but also on-the-job training that is off-campus, out-of-classroom experience (Lupton, 1979). Lupton defined cooperative education as “experiential programs where work or job-training is essential, usually paid, and usually (but not always) career-oriented in terms of the student’s major field of study” (p. 142) and it was conceptually different from six other common types of experiential programs, namely, practicum, public-service internships, service-learning programs, international experiences, student self-designed experiences, and comprehensive programs. Since the area of interest in my dissertation was the cooperative experience of pharmacy students, my review of the literature in this chapter placed an emphasis on cooperative education where possible, and did not necessarily cover the other six types of experiential programs.

Swanson et al. (1982) further explained that cooperative education is an educational philosophy that was “built upon the cooperation of employers and educators to develop an integrated educational program for the student” (p. 165). Therefore, despite my research focused on the cooperative experience of pharmacy students, it was relevant to also seek the perspectives not only from the students, but also from the co-op employers and faculty members of the UW School of Pharmacy.

Swanson et al. (1982) identified that students typically could self-discover their strengths and weakness from their co-op experience, and this could then help with their choice and application of subsequent co-op placements. Essentially, this internal ongoing self-assessment
and reflection in students with respect to their individual strengths and weaknesses through cooperative education supported Kolb’s experiential learning cycle (Figure 2).

Most educators would not argue with the fact that students learned best through experiential learning, that is, when they were fully engaged and working in the field, the real-world environment. Even better would be the case that experiential learning was coupled and enriched by action and ongoing reflection, integrating and connecting past experiences with new learning (Burnard, 1996; Rogers, 1996; Weinstein, 1999). Again, this conveyed the fundamental aspects of Kolb’s experiential learning theory (Figure 2).

Fletcher (1991) perceived that the outcomes of cooperative education typically involved personal development, career development, and academic achievement, but the conditions, variables, or processes of how these outcomes could be achieved were yet to be determined. My dissertation intended to look at how co-op experiential learning influenced the professional and personal development of undergraduate pharmacy students and, hopefully, my findings might address some of Fletcher’s concerns.

2.3.1 Health Professions and Other Disciplines

Most of the health care professional curricula were packed with heavy course work and on-campus skills labs. To incorporate additional co-op work experience for students had always been a challenging task for administrators and educators. However, Krishnan (2010) was able to demonstrate and identify a co-op model, which was deemed to be an invaluable component for a biomedical engineering program in Boston, United States. Although Packman and Krackov (1993) did not explicitly called their work as co-op education for medical students, what they had implemented for the third-year Medicine Clerkship at the University of Rochester, New York, United States, did show an appreciation for practice-based education; although unpaid, medical
students were actively involved in “the real-life immersion in the daily practice of internal medicine” (p. 195).

In the United Kingdom (UK), Wilson and Pirrie (1999) explored and reported on perceptions of health care clinicians in general medicine, dentistry, accident and emergency, obstetrics and gynecology, and laboratory medicine on work-based learning in 10 health care organizations in Scotland. They determined that the relationship between work experiences and learning could be affected by various factors, such as, team dynamics in the practice setting, opportunities for the learners to apply knowledge and practice skills in a safe environment, transparent and open communication within and inter-professions, as well as support for ongoing feedback and self-reflection (Wilson and Pirrie). Maudsley and Strivens (2000) highlighted experiential learning as an important complement to the traditional undergraduate medical education, as it enhanced medical students’ professional knowledge acquisition, critical appraisal skills, clinical problem-solving capabilities, and prepared them for lifelong learning in their professional career. Another study in the UK, reported by Owens and Gibbs (2001), although not necessarily a co-op experiential learning model, raised the importance of early engagement of second-year medical students in the community as a source of learning; and in this case, “an early appreciation of the community pharmacist as a professional colleague [by medical students] may result in a more interdisciplinary approach to patient care in the future” (p. 308). As such, if pharmacy students were engaged in co-op experiential learning in the early years of their curriculum, they would then not only have a better understanding and appreciation of the roles and responsibilities of other healthcare professionals, but also learn about the importance of inter-professional collaboration in the delivery of quality patient care. Of interest, Owens and Gibbs concluded that their work incorporated an activation of prior learning experience, students’ self-reflection, shared feedback and discussion with their peers of what they
experienced at the community pharmacy, which echoed Kolb’s four-stage experiential learning cycle (Figure 2) to some extent.

Laschinger (1992), adapting Kolb’s experiential learning theory, presented a descriptive, exploratory study in Ontario, Canada, and sought nursing student perceptions of their real-life practice environments, their skills and competencies, and the contribution of different learning/practice environments to the development of their skills and competencies, at various stages of their curriculum. Laschinger’s work also supported the research design of my dissertation of involving one class of pharmacy students at the UW School of Pharmacy, as Laschinger’s study “was exploratory in nature, [hence] one school of nursing was considered appropriate to ensure relative homogeneity of student experiences with regard to curricular focus, organizational climate and culture, and clinical learning opportunities” (p. 109). In addition, there were many similarities between pharmacy and nursing professions, in which person-environment interaction was critical in the personal and professional development of the individuals in these two professions where they were expected to excel in both people-oriented skills and the application of scientific knowledge (Laschinger).

Most often, student application of scientific knowledge and skills in learning/practice environments was measured and captured by school-administered or required assessments, for instance, PLOT in the case of the UW School of Pharmacy co-op program, therefore the focus of my research was on the personal and professional development of pharmacy students; in other words, the human-oriented skills and human relations where applicable.

Linn (1993) shared a work/study undergraduate psychology curriculum at the Antioch College in Ohio, United States; again using Kolb’s experiential learning cycle as the theoretical framework and reiterating that experiential learning is imperative to student development. Linn also highlighted the spirit of co-op education, in which:
Experiences in the world of work generate learning very broadly defined: how to find your way in a new city, how to budget your salary to eat and pay the rent, how to fit in to a group of workers … a lot of ‘knowing how’, when usually we think of a college education as ‘knowing that.’ (p. 3)

Linn (1993) reported that students perceived their co-op experiences had significantly impacted their values, intellectual development, social development, and career development; particularly, students reported “both positive career development (that is, ‘this is what I want to do’) and negative career development (‘this is what I don’t what to do’)” (p. 10). Linn concluded that work was an important component in the training of new psychologists. Noting that Linn’s study took place in the early 1990s and extrapolating her findings, it appears that work (or co-op education) does have a role in the training of new pharmacists in the 21st century.

Although the work by Martin (1998) in Melbourne, Australia, focused on the conception of work placement by academic staff and faculty who were involved in work-based programs in four areas of study – electronic engineering, accounting, youth work, medical laboratory science – and not necessarily on how students perceived their experiential learning, it did present some interesting implications pertaining to students:

Students do not learn because they have skills. They learn because they conceive of a problem and engage with it in a particular way…. Students develop in the workplace, not because supervisors provide the opportunity for them to develop skills, but because they provide an opportunity to engage in relevant and significant problems as a professional would. (p. 204)

Martin (1998) also mentioned that “there is a direct relationship between … the satisfaction of students and employers with the placement and staff’s conceptions of the work placement” (p. 198). Therefore, to some extent, it was rational to consider the viewpoints of co-op education by faculty or staff members who taught pharmacy students from the vanguard or first class at the UW School of Pharmacy in my research.
The rationale for Ieva, Ohrt, Swank, and Young (2009) in Florida, United States, to conduct their qualitative study on 15 master’s level counselors-in-training was two-fold: there was limited information regarding counseling students’ perceptions of how experiential learning influenced their personal growth and professional development; and an understanding of the students’ perspectives was vital for better design and delivery of the experiential element of the counselor education program. Similar circumstances could also be applied to the pharmacy profession, and hence the focus of my research was also on how co-op experiential learning influenced the professional and personal development of undergraduate pharmacy students at the UW School of Pharmacy. Ieva et al. (2009) explained the use of qualitative methodology in order to illustrate a rich description on students’ experiences; and this also supported the qualitative approach in my dissertation.

In addition, some of the assumptions made by Ieva et al. correspond to those that I made for my research – experiential learning was beneficial to the students; and students acquired some skills and knowledge during the work experience. In fact, Ieva et al. concluded that all students reported personal self-awareness and development (that is, gaining an insight of an individual’s strengths and areas for improvement), professional development (that is, acquiring skills and attributes that were required for being a professional counselor and experiencing the linkage from classroom lecturers to real-world counseling), and other skills development (such as, communication, interpersonal relationships, empathy, and appreciation of group dynamics).

Spector (1980) described his personal experience of spending a year clerking in different law firms, with various legal positions, before beginning his third year of law school in Atlanta, United States. Despite this was a student self-designed experience, Spector highlighted the value of experiential learning and co-op education early in the curriculum of a professional degree:
My experience has opened my eyes to the practice of law and changed what I thought would be the areas of law in which I would be interested. This knowledge has helped me revise my curriculum for the third year of law school and left me anxious to begin my studies. I suspect that because of this experience my third year will also be easier for me than it would have been otherwise. The fifteen months I clerked gave me the opportunity to refresh my mind and bank account and I suspect that as a result of my experience I will be a more appealing candidate to offer an associateship than I would have been without that experience. (p.527)

Applying Spector’s experience in pharmacy, it would be a fair assumption that the four, 16-week co-op work terms at the UW School of Pharmacy would likely offer students the opportunity to find out the areas of pharmacy practice they would be interested (or not interested), to inform them of their selection of elective courses in the third year and fourth year of their program, and to support them emotionally and financially when they returned to their academic semesters after completing each of the work terms (Figure 1).

In the sciences, technology, engineering, and mathematics (STEM) disciplines, experiential learning also played a significant role in the undergraduate curriculum. Although Thiry, Laursen, and Hunter (2011) placed an emphasis on research experiences in STEM undergraduates, they did touch on the essence and benefits of out-of-class work experiences, while interviewing students from four liberal arts colleges in Colorado, United States. Thiry et al. (2011) elaborated that:

Work experiences, such as internships and the clinic program, offered students the opportunity to take ownership of a real-world project, clarify future career goals, and begin to develop an identity as a professional. Clinic students described developing teamwork skills as they collaborated closely with peers on an authentic task. Research students reported gains in understanding and developing the temperament and identity of a scientist. (p. 383)

In other words, the gains in co-op education were evident in the personal and professional development of students, as the real-world exposure at work created an authentic opportunity for students to explore and learn more about their strengths and weaknesses; and in the case of
health care profession training, it helped shape the student’s identity of a professional early on in their program.

Even in the non-science discipline, experiential learning, for instance, in the form of internships, was not uncommon. Schenbeck (1996) presented a four-stage music-industry internship program at the Georgia State University, Atlanta, United States. This four-stage model substantiated the theoretical concept proposed by John Dewey with respect to experience and education, as well as Kolb’s experiential learning theory; according to Schenbeck (1996):

In order to reap the greatest benefit from an education, the student must be exposed not only to cognitive learning, but also to experiential learning. If an institution postpones internship experience until just prior to graduation, no time is left to reintegrate this experience with what was learned in classes….the best education would be one in which the internship experience was integrated into all four years of undergraduate education [italics added]. The student would then bring each period of experiential learning back into the classroom so that transformation of the new knowledge would take place based not only on his personal and social experience, but also on the personal, social, and previous academic experiences of his teachers and peers, thus broadening the scope of knowledge. (p. 101)

The four, 16-week co-op work terms at the UW School of Pharmacy, similar to the music-industry internship four-stage model, where students were often employed by different practice sites at their subsequent work terms, were also integrated into all four years of the undergraduate pharmacy curriculum (Figure 1). Schenbeck (1996) reported that the music-industry students, after completing the four-stage internship program, had demonstrated not only psychological and cognitive growth, but also improved interpersonal skills. Based on this, I speculate that students who underwent the four work terms at the UW School of Pharmacy might very likely experience similar individual personal growth and acquire comparable skills as the music-industry students. The real-life work experiences offered students an invaluable “process of learning, transforming, and constantly reintegrating one’s knowledge with thought processes
and life experience [that] provides students with tools for lifelong growth” (Schenbeck, 1996, p. 106).

2.3.2 Pharmacy

My search and review of the literature did not retrieve any specific information pertaining to co-op experience in Canadian pharmacy education. The closest match would be a few studies on experiential learning, but not necessarily related to co-op education, in the United States, the United Kingdom, Finland, Australia, and Malaysia.

The American Council of Pharmaceutical Education (ACPE) accreditation standards for Doctor of Pharmacy degree programs in the United States expected that introductory and advanced pharmacy practice experiences were part of the core curricular areas in pharmacy education; the practice experience program (PEP) curriculum then expanded beyond the traditional externships in the 1970s and clerkships in the late 1970s (Campagna et al., 1994). These introductory and advanced pharmacy practice experiences were usually unpaid and structured with defined goals and learning objectives for pharmacy students.

Typically, most pharmacy programs put their emphasis on practice experience at the end of the curriculum, such as, an internship or clinical rotation after the last year of academic work and prior to licensure (Pitka, Lofhjelm, Passi, & Airaksinen, 2014). The ACPE proposed a major reform in the pharmacy curriculum in mid-1990s by mandating a practical component early in the pharmacy programs – Introductory Practice Experiences (IPE) or introductory pharmacy practice experiences (IPPE) – for the purpose of integrating experiential activities and increasing students’ exposure to pharmaceutical care (Beck, Thomas, & Janer, 1996).

Subsequently, a survey research was conducted by the Midwestern University College of Pharmacy in Glendale to study the implementation of IPE by schools and colleges of pharmacy
in the United States in 2002; it was found that the ACPE mandate of IPE was met, but with a wide range of interpretation among different schools and colleges, which warranted ongoing discussion and fine-tuning of such program in the pharmacy academia (Peters & MacKinnon III, 2004). For instance, an introductory pharmacy practice experience (IPPE) course was implemented in Year Three of the pharmacy curriculum in the College of Pharmacy, University of Georgia (Chrisholm, DiPiro, & Fagan, 2003) and the School of Pharmacy, University of Colorado Health Sciences Center (Turner, Altiere, Clark, Dwinnell, & Barton, 2004) in the United States. The findings were positive and encouraging such that pharmacy students enjoyed the practical experience as well as acquired knowledge in direct patient care activities and experience in working with other health care professions, like physicians and nurses.

While pharmacy students in the United States were expected to be exposed to clinical activities with anticipated positive outcomes like the ones mentioned above during their ACPE-mandated, usually unpaid and structured, pharmacy practice experiences, such as IPPE, Nathan et al. (2011) took the initiative to find out more about the paid, relatively less structured internships by surveying the hospitals in New York. Pharmacy student internship programs most often took place outside of the Doctor of Pharmacy curriculum in the United States and each state might have a different set of requirements for internships (Skledar, Martinelle, Wasicek, Mark, & Weber, 2009). Nathan et al. (2011) discovered that pharmacy interns, although performed various pharmacy-related functions at the hospitals, were primarily involved in technical, non-clinical activities. Nathan et al. believed that if a pharmacy intern was being used and delegated with clinical tasks similar to those of a licensed pharmacist, then the intern would “have a better understanding of the function of the pharmacy department and the health care organization, … use the knowledge gained in school, and increase job satisfaction” (p. 168).
In Pennsylvania, United States, pharmacy students could complete their internships, which might be up to 750 hours outside of the Doctor of Pharmacy curriculum, in a flexible manner. For instance, “internships may be completed longitudinally throughout a student’s years of pharmacy school as summer learning opportunities or as full-time training in the summer and part-time during the academic year” (Skledar et al., 2009, p. 1561). Skledar et al. (2009) described how the University of Pittsburgh Medical Center (UPMC), took advantage of such flexibility and implemented a structured, hospital-based, pharmacy internship program, involving students longitudinally from all four years of the pharmacy program, with a dual purpose of creating an early hospital pharmacy practice experiential learning opportunity for students as well as executing a recruitment and retention strategy for potential pharmacists at the UPMC. The deployment of the pharmacy internship positions at the UPMC, to some extent, was very similar to co-ops at the UW School of Pharmacy, where students were presented with job descriptions and salary expectations and they had to apply and complete for such opportunities.

Clark (2007) presented another example of a paid, summer full-time (that is, 40 hours per week during the summer months) pharmacy internship program outside of the Doctor of Pharmacy curriculum at the John Hopkins Hospital, in Baltimore, Maryland, United States. Similar to the UPMC internships, pharmacy students in all four years of the pharmacy program could apply for the internships at the John Hopkins Hospital and candidates were selected after a formal application process, including interviews (Clark, 2007). Clark implied that this was a structured program with learning objectives, ranging from participation in journal club, development of career goals and leadership skills, to the implementation of medication safety initiatives. Pharmacy students expressed that their preferred experiences of this program, which included the engagement in journal club discussions where they could improve on their literature review skills, and the shadowing of pharmacists in various practice settings from which they
could recognize and be exposed to the various career opportunities in institutional pharmacy practice (Clark, 2007).

Alternatively, Smith, Barnette, and Maffeo (2000) shared a successful, cost-effective experience with a paid, regular part-time (i.e., 20 hours per week) pharmacy student internship program at a primary care clinic operated by the University of Colorado Hospital in Denver, United States, where two or three part-time pharmacy student interns, guided by a protocol, managed the prescription refill program at the clinic by reviewing and updating the medication history of patients, ordering laboratory tests or procedures for patients when necessary, recommending patient follow-ups, and identifying and resolving drug related problems. Smith et al. (2000) reviewed the outcomes of this structured internship program and reported that:

An added bonus of the refill program is that Pharm.D. [Doctor of Pharmacy] students are afforded an excellent opportunity to develop problem-solving skills and apply therapeutic knowledge in a clinical setting. The pharmacy interns experience real-world exposure to patients and can observe and interact with all members of the health care team, including pharmacists, physicians, nurses, social workers, and support staff. Under the guidance of the protocol, the interns develop clinical judgment in a protected environment that does not jeopardize patient care. (p. 759)

In the United Kingdom (UK), Shah (2004) reported favourable outcomes pertaining to student communication and clinical skills by incorporating work placements in an undergraduate pharmacy curriculum at one school. However, Brown et al. (2005) pointed out that “the training of UK pharmacy students is almost unique among the health professions in that there is no specific and universal requirement that they should undergo practice-based training before graduating” (p. 144). Despite this, it was well known that students were often engaged in pharmacy-related jobs during their summer holidays, or the so-called vacation placement/experience schemes in the UK (Brown et al., 2005). Therefore, Brown et al. surveyed the entire pharmacy student population of the University of Portsmouth, in Hampshire, UK, in order to learn more about students’ out-of-class work experiences.
Overall, students’ perception of experiential learning was positive and they preferred that such real-life experiences be integrated into their four-year undergraduate pharmacy education, because such experiences were complemented with various advantages – early exposure to the profession that would facilitate their career planning, development of generic and transferable skills like communication, problem-solving, and teamwork, as well as financial support for their tuition if it was a paid position, just to name a few (Brown et al., 2005). Brown et al. (2005) concluded with a comprehensive summary of pros and cons of out-of-class work experiences based on perceptions from pharmacy students, work placement employers/providers, and the school of pharmacy. This summary could serve as a reference for my research findings from pharmacy students, co-op employers, and faculty members of the UW School of Pharmacy.

The study conducted by Pitka et al. (2014) at the University of Helsinki, Finland, perhaps had the most similarities to the co-op education model at the UW School of Pharmacy. The European Union (EU) directive on the recognition of professional qualifications with respect to pharmacy education was recently updated to reflect that the required 6-month internship in pharmacy practice could take place either during or at the end of the professional program at the university. At the University of Helsinki, the 6-month internship, paid by the sites where the internship took place, was broken down into two 3-month periods, integrated in the curriculum, with the first internship period at the end of the second year of study, and the second internship period during the spring semester of third year; and this model had several pedagogic advantages, as identified by pharmacy students, university faculty and staff, and preceptors at the internship sites (Pitka et al., 2014):

The practice of integrating the internship into the curriculum is beneficial and supportive of the learning process. Students are able to explore real professional work in community or hospital pharmacy settings early [italics added] on in their studies…. Other advantages of the Finnish internship system include feedback [italics added] students acquire from preceptors after the first internship period, which results in experiences they can share
with other students. In addition, encouraged *self-reflection* [italics added] between the two internship periods is also an essential, beneficial part of the system. (p. 5)

I perceived that the above pedagogic advantages were related to some of the elements in Kolb’s experiential learning cycle (Figure 2). The main difference between the Finnish paid internships and the co-ops at the UW School of Pharmacy was that the former was very structured, where “the key learning objectives [and core contents] of the internship are determined by a collaboration between universities and the training pharmacies” (Pitka et al., 2014, pp. 2-3). In other words, the learning objectives of the 6-month internship for pharmacy students in Finland were very much set and pre-determined, while the co-ops at the UW School of Pharmacy were not as structured.

Other differences between the two schools included the duration of the experiential learning (6-month internship in Finland compared with four, 16-week co-op work terms at the UW School of Pharmacy) and the flexibility of training sites – pharmacy students in Finland were restricted to either community or hospital pharmacy practice sites for their internships, while students at the UW School of Pharmacy could work at non-direct patient care sites, such as government agencies, medical information, consulting firms, etc.

In Australia, pharmacy educators, while recognizing the pivotal role of experiential learning in undergraduate pharmacy education, conducted the “Experiential Placements in Pharmacy” research project with the objectives to document current practice of experiential placements in Australian university pharmacy schools and offer recommendations to improve the learning design of such programs (Owen & Stupans, 2009). Similar to the United States, Owen and Stupans found that there was a wide range of experiential placement programs in Australian pharmacy schools with various degree of impact on the undergraduate pharmacy curriculum. As a result, three recommendations were made, based on a collaborative effort among pharmacy
students, faculty, and professional regulatory representatives, towards the establishment of a central repository of experiential learning and assessment tasks; development of a set of professional competency descriptors for early and advanced pharmacy practice experience; and setting up of quality assurance indicators for pre-, during, and post- experiential placements (Owen & Stupans, 2009). However, this study placed an emphasis on experiential program improvements rather than students’ perception on experiential learning.

Ting, Wong, and Thang (2009) recognized that little was known regarding experiential learning in the early stages of undergraduate pharmacy education and conducted a mixed method study to explore first year pharmacy students’ perceptions of their informal, optional, and usually unpaid work-based learning that took place during their summer vacation in Malaysia. Despite the fact that the experiential learning was unstructured and with a wide range of duration (from three to 90 days), pharmacy students found that the real-life experience was very positive and valuable with acquisition of skills that pertained to pharmacy professional competencies and transferable skills, such as people skills, communication, stress management, etc., that could not be effectively learned in a classroom setting (Ting et al., 2009).

2.4 Summary

In this chapter, I first differentiated the meaning of experiential learning and experiential education, of which I focused on the former in my dissertation. Then, I explained that co-op education was conceptually different from six other common types of experiential programs, including practicum, public-service internships, service-learning programs, international experiences, student self-designed experiences, and comprehensive programs. My resulting search and review of the literature did not yield any specific information on co-op education in Canadian undergraduate pharmacy programs. Therefore, I expanded my search and reported on
experiential learning in other disciplines, such as, biomedical engineering, general medicine, dentistry, accident and emergency, obstetrics and gynecology, nursing, psychology, electronic engineering, accounting, youth work, medical laboratory science, counseling, law, STEM, and music industry.

With respect to the pharmacy literature, I was able to locate several studies on experiential learning, but not necessarily co-op related, in the United States, the United Kingdom, Finland, Australia, and Malaysia. Yet, none of these studies could be fully applied or generalized to the contexts of the UW School of Pharmacy where its co-op model, while offering students a paid and relatively unstructured work experience, was mandatory with a pre-defined duration of four, 16 weeks, and integrated into all four years of the undergraduate program (Figure 1) instead of the traditional practicum or internship that took place at the very last year of academic work just prior to licensure. For example, the Malaysian study (Ting et al., 2009) supported the work-based learning early in the undergraduate pharmacy curriculum, but findings were limited to an optional and unstructured experiential learning in either hospital or community pharmacy settings. This was very different from the UW School of Pharmacy where the mandatory four, 16 weeks co-op work terms were integrated throughout the four-year curriculum and students could practice in direct-patient-care settings (like hospital or community pharmacies) or non-traditional placements, such as pharmaceutical industry, government agencies, or professional associations.

Despite the limited number of publications in co-operative education in Canadian or even North American undergraduate pharmacy programs, one common theme was consistently emerged from my review of the literature – the adoption of Kolb’s experiential learning cycle as the theoretical framework and the sensitizing concept of which I used to facilitate the analysis of my research findings. In addition, the use of a qualitative, descriptive, and exploratory approach
in my case study with a single cohort was supported by Laschinger (1992) and Ieva et al. (2009), because this would help maintain the homogeneity of student experiences. Finally, the idea of seeking multiple perspectives from pharmacy students, co-op employers and faculty members of the UW School of Pharmacy in my research was substantiated by previous work of Swanson et al. (1982), Martin (1998), and Brown et al. (2005).

Within the UW co-op model, from a broader perspective, students were generally constantly going through Kolb’s four-stage experiential learning cycle (Figure 2), in which ongoing self-assessment and reflection helped students liaise their academic learning and real-world practical experience. In my study, through theoretical sampling and information sources collected from pharmacy students from the vanguard or first graduating class of the BScPhm program at the UW School of Pharmacy, often referred to as the Rx2011 class, who already completed their four co-op work terms, co-op employers, and faculty members, I attempted to explore the cooperative experience of pharmacy students and find out how co-op experiential learning affected pharmacy students’ professional and personal development. I expected that, within the realm of co-op experiential learning in Canadian undergraduate pharmacy education that was not vastly reported in the literature, some unique elements or conditions might be identified in my research and incorporated to the existing framework of Kolb’s experiential learning theory (1984).
Chapter 3
Research Design and Methodology

This was an exploratory descriptive case study of the vanguard or the first graduating class of undergraduate pharmacy students at the UW School of Pharmacy who graduated in August 2011. In this chapter, I will summarize the research design, the participant design, data collection and analysis and some limitations.

3.1 Research Design

In order for me to gain an insight into the cooperative experiences of pharmacy students, and, in particular, how such experiences influenced their professional and personal development, I adopted qualitative research in my study. This was because qualitative research could facilitate me as the researcher “to access the thoughts and feelings of research participants, which can enable development of an understanding of the meaning that people ascribe to their experiences” (Sutton & Austin, 2015, p. 226). Anderson (2010) pointed out that education often involved complex situations and human interactions, therefore qualitative research could provide a deeper understanding of the educational issues and related contexts. Furthermore, participants often shared their viewpoints liberally during common data collection methods in qualitative research, such as, interviews and focus groups, which might help elucidate why and how their experiences, thoughts, and feelings affected their behaviours (Sutton & Austin, 2015).

A case study approach was selected based on the fact that a case study of a single cohort would not only warrant homogeneity of student experiences to some extent (Laschinger, 1992), but also allow me to gain a deeper understanding of the phenomenon, that is, the cooperative experience of pharmacy students, being studied (Creswell, 2003). In order to explore how pharmacy students’ professional and personal development were influenced by the phenomenon
of co-op experiential learning, interview data were the primary source of information, from which thematic implications were generated (Creswell, 1998) and proposed to Kolb’s experiential learning theory.

3.1.1 Constructivism

Of the four world views or alternative knowledge claims defined by Creswell (2003), constructivism was the lens that I used to explore how co-op experiential learning influenced the professional and personal development of undergraduate pharmacy students at the UW School of Pharmacy. Creswell (2003) defined that social constructivism appreciated the interactions among people whose subjective meanings and interpretations of the world were not being provided, but derived from social discussions and negotiations with other individuals. Social constructivism offered a perspective on knowledge claims through an inductive approach with an attempt to generate a theory through social interaction with individuals (Creswell, 2003). Because of the limited scope of this case study, no attempt was made to generate theories based on the constructivist approach used. In my research, I approached the data as follows, which aligned well with what Crotty (1998) proposed for constructivism.

- By engaging various groups of participants, that is, pharmacy students, co-op employers, and faculty members of the UW School of Pharmacy, I allowed them to freely express their viewpoints during their interviews and focus group sessions.
- Being a practicing pharmacist for almost 20 years and a member of the adjunct teaching faculty at the UW School of Pharmacy, I interpreted the findings from this study based on my review of the literature, my current and past experience of the pharmacy profession.
- An inductive approach was applied in identifying themes and developing an understanding based on the data collected in this study (Creswell, 2003).
3.2 Site and Participant Selection

The co-op curriculum at the UW School of Pharmacy was the first of its kind in Canada. Therefore, it was critical to capture first-hand information and experience from the first graduating class of students who had completed the four, 16-week co-op work terms – hence, a purposive sample, in this case. Other groups of individuals who were involved in this first-round implementation of the co-op program – co-op employers and faculty at the UW School of Pharmacy – were also participants of my study. Alternatively, this could be considered as theoretical sampling, as my approach of seeking perspectives not only from pharmacy students, but also from co-op employers and faculty members of the UW School of Pharmacy in my research, was inspired by previous studies by Swanson et al. (1982), Martin (1998), and Brown et al. (2005). Furthermore, triangulating multiple sources of data from pharmacy students, co-op employers, and faculty members helped to substantiate the credibility of my research findings, which I elaborate later in this chapter.

All 88 students from the vanguard or first graduating class of the BScPhm program at the UW School of Pharmacy, often referred to as the Rx2011 class, were invited to participate in the semi-structured interviews of my study. Since I was a part-time adjunct teaching faculty at the UW School of Pharmacy and I might know some of the students from lectures that I previously taught this class, I asked a research assistant (BM) to recruit participants on my behalf. BM distributed recruitment and information-consent letters (Appendix B) to the student participants during class time in the summer of 2011. Interested student participants were asked to contact BM.

In addition, co-op employers who hired a student from the Rx2011 class between 2008 and 2010 were invited to participate in semi-structured telephone interviews of my study. I
obtained the co-op employers’ contact information from the UW School of Pharmacy’s Assistant Director, Experiential Learning. Recruitment and information-consent letters (Appendix C) were emailed to this group of participants in the summer of 2011.

I also invited faculty members who taught the Rx2011 class to participate in the faculty focus groups of my study. Similarly, recruitment and information-consent letters (Appendix D) were emailed to this group of participants in the summer of 2011.

3.3 Data Collection and Recording

Glaser and Strauss (1967) defined theoretical saturation as the point at which a theme or category was saturated and no additional data could be found to further contribute or add to the theme. Alternatively, data saturation could be considered as the point where all variations or factors of the phenomenon had been captured and represented in the emerging theory (Guest, Bunce, & Johnson, 2006). Guest et al. (2006) recommended that twelve interviews should be sufficient for reaching data saturation and thematic discovery provided that the research objective was to understand a common perspective or experiences among a group of relatively homogenous participants. In fact, Guest et al. (2006) stated that for higher-level thematic generation, a sample of six interviews would be enough for deriving meaningful interpretations.

Since my objective was to explore the common perception of co-op experiential learning from a group of homogenous pharmacy students, a target of 12 semi-structured face-to-face interviews with students from the Rx2011 class was considered sufficient for the purpose of reaching data saturation and thematic discovery using an inductive approach in my data analysis. The case study approach was a good one for this study as I have knowledge and preconceptions in the field of pharmacy practice and pharmacy education that might colour my interpretation of the data. The student interviews were conducted by BM (who signed a confidentiality statement
– see Appendix H) on my behalf. Face-to-face interviews were chosen because this class of students was on campus during the summer of 2011 before they graduated in August. My interview guide is included in Appendix E. BM audio-recorded the interviews (with participants’ consent), and transcribed them; we coded the interview data using NVivo qualitative research software respectively.

Semi-structured telephone interviews, with 12 co-op employers, were also conducted. Telephone interviews were used for this group of participants due to logistical constraints, as these co-op employers were distributed throughout Ontario, Canada. My telephone interview guide is included as Appendix F. Similarly, the interviews were audio-recorded (with participants’ consent), transcribed, and coded using NVivo qualitative research software.

I was not able to ask the students and the co-op employers to validate their own transcripts due to logistical reasons. By the time the interview data were transcribed, students had already graduated and left the School of Pharmacy. If I had to approach the co-op employers again through the Office of Experiential Learning to validate their interview transcripts, it would post a logistical and administrative burden to the staff at the office. Furthermore, Carlson (2010) cautioned researchers on several traps and concerns in member checking. Therefore, I decided to apply other measures to establish credibility in my study.

I hosted two focus group discussions with a total of 12 faculty members at the UW School of Pharmacy. With respect to the three types of participants in my research, faculty, which comprised of 30 members, was the smallest group. Similar to students, faculty members were easily accessible at the school. The dynamics of a focus group with a small number of faculty members generated rich discussion among the participants. My focus group discussion guide is included as Appendix G. Since I asked a series of pre-determined open-ended questions, the discussion during the focus group session allowed me to explore participants’ knowledge,
attitudes, and experiences, and investigate what, how and why they perceived students’ experiential learning (Kitzinger, 1995). However, even though I was not in any line relationship with any of the participants, my presence during the focus groups, which was inevitable, may have influenced the faculty members’ responses and discussion (Anderson, 2010). Again, the focus group sessions were audio-recorded (with participants’ consent), transcribed, and coded using NVivo qualitative research software.

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Sources of Data</th>
<th>Data Collection Methods</th>
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<tbody>
<tr>
<td><strong>Research Question #1:</strong> How does co-op experiential learning influence the professional and personal development of undergraduate pharmacy students in Canada?</td>
<td>19 students from the Rx2011 class at the UW School of Pharmacy</td>
<td>19 semi-structured face-to-face interviews</td>
</tr>
<tr>
<td></td>
<td>12 co-op employers who hired students from the Rx2011 class between 2008 and 2010</td>
<td>12 semi-structured telephone interviews</td>
</tr>
<tr>
<td></td>
<td>12 faculty members who taught the Rx2011 class between 2008 and 2010</td>
<td>Two focus groups</td>
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</tbody>
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**Research Question #2:**
What are the perspectives of the following groups of individuals towards the impact of co-op experiential learning on students’ professional and personal development?
- Students
- Co-op employers
- Faculty

*Figure 3.* Data sources to answer my research questions

Triangulation of the three sources of qualitative data, from pharmacy students, co-op employers, and faculty members, respectively, by comparing and contrasting themes generated from them helped improve the trustworthiness and authenticity of my research findings. I summarized the data sources for answering my research questions in Figure 3.
3.4 Establishing Credibility

3.4.1 Trustworthiness

Sutton and Austin (2015) noted that in qualitative research, there were no statistical methods that could be used to test validity or reliability as in quantitative research, and an alternative was to establish trustworthiness in my study. Trustworthiness, according to Carlson (2010), referred to “how much trust can be given that the researcher did everything possible to ensure that data were appropriately and ethically collected, analyzed, and reported” (p. 1103). It was often interchangeably known as authenticity, or credibility (Carlson, 2010). However, several other methods, such as triangulation of data sources, audit trails and reflexivity supported the credibility of the findings.

3.4.1.1 Triangulation

Anderson (2010) suggested that validity could be supported by a number of techniques, such as triangulation, that is, the use of “two or more methods to study the same phenomenon” (p. 2). Carlson (2010) asserted that, for the purpose of triangulation, data collection could be acquired from different people or groups; or from different methods, such as interviews, questionnaires, etc. In my study, I tried to convey trustworthiness and authenticity by gathering data from multiple sources that were derived from interviews of pharmacy students, interviews of co-op employers, and focus groups of faculty members at the UW School of Pharmacy. In addition, I also employed triangulation in my data analysis, during which I worked with two other researchers (BM and AK) and conducted the analysis, first individually, followed by a comparison of our findings and interpretations (Carlson, 2010).
3.4.1.2 Audit Trails

During my data analysis, I asked another researcher (AK), who was external to my study, to code the transcripts and share his views on theming in order to improve the credibility of my findings (Sutton & Austin, 2015). This aligned with what Carlson (2010) referred to as having an external auditor, as in audit trails, which was one of the common procedures to increase trustworthiness in qualitative research, to review my findings.

3.4.1.3 Reflexivity

I also attempted to utilize reflexivity as another method to support the trustworthiness of my study (Carlson, 2010) by upfront being transparent in Chapter 1: Introduction and disclosed the potential and unavoidable biases that I might have due to my prior learning experience in a pharmacy school without a co-op component and my practice as a pharmacist in the last 20 years with a set of pre-defined and pre-conceived notions of educational and professional competencies that are embedded in my mind unconsciously.

3.4.2 Content and Face Validity

My research was likely the first exploratory study in the field of co-op experiential learning in undergraduate pharmacy programs in Canada. Therefore, when seeking content validity for my interview guide for pharmacy students (Appendix E), my telephone interview guide for co-op employers (Appendix F), and my focus group discussion guide for faculty members (Appendix G), respectively, I relied primarily on concepts that I found in my review of the literature and selected elements from the NAPRA MSOP for Canadian Pharmacists (2009) (such as, collaboration, safety, professionalism, and ethics) and the PLOT constructs (for example, patient care, health promotion, management and leadership), which were pre-defined and pre-conceived goals for pharmacy students at the UW School of Pharmacy.
While exploring the co-op experience of pharmacy students, I intended to find out more about their professional and personal development. With respect to the content validity of professional development, Hall et al. (2012) posited that patient-centred care, which was expected in current pharmacy practice, required not only clinical practice skills, but also critical thinking, decision-making, and collaborative interpersonal skills; Austin, Marini, Macleod-Glover, and Croteau (2005) also asserted that “workplace [experiential] learning as a primary vehicle for CPD [continuous professional development]” (p. 29) for pharmacists in Ontario, Canada. Consequently, I perceived that pharmacy students, through their co-op or workplace experience, would acquire some of the skills suggested by Hall et al. and Austin et al. (2005), and hence included these skills as probing questions in my interview and focus group discussion guides.

Regarding the validity of students’ personal development, I believed that, if a co-op program at a college could educate gifted secondary students as a whole person with “cognitive, emotional, and social development….and honor each student as an active maker of meaning who needs a rich set of experiences from which to generate an adequate understanding of self and world” (Keen & Howard, 2002, p. 133), then the co-op program at the UW School of Pharmacy would have influenced personal development of pharmacy students to some extent. In order to better understand the co-op experience of pharmacy students and their personal development, I sought viewpoints regarding some of the aspects identified by Keen and Howard (2002) from pharmacy students, co-op employers, and faculty members respectively and, hopefully, corroboratively.

To establish the face validity of my instruments for data collection, I pilot tested the semi-structured interview questions with three pharmacy students who were not from the Rx2011 class at the UW School of Pharmacy, but who had also undergone some of their co-op
work terms. I asked them to comment on the clarity of the questions and whether or not the wording or sequence of questions was leading in any way. Based on their input, I revised the interview questions before passing the discussion guide on to my representative (BM, the Research Assistant) who then conducted the interviews with students from the Rx2011 class on by behalf.

Similarly, I pilot tested the semi-structured telephone interview questions with three co-op employers and subsequently fine-tuned the questions based on their feedback and suggestions. I also asked three faculty members to review my focus group questions. Revisions to my focus group discussion guide (Appendix G) were made accordingly.

### 3.5 Data Analysis

I used NVivo qualitative research software for coding and thematic generation of the data collected from interviews and focus groups. During my data analysis, I asked another researcher (AK), who was external to my study, to code the transcripts and share his views on themes identified. In general, I worked with two other researchers (BM and AK) and conducted my data analysis, first individually, then followed by a comparison of our findings and interpretations (Carlson, 2010). Iterative review of the transcripts led to thematic analysis for the three sources of data, from students, co-op employers, and faculty respectively. Constant comparison analysis was helpful in triangulating, coordinating, and interpreting the overall findings of my study. At the same time, key words and key phrases were derived from the free nodes or tree nodes during coding in NVivo. In the case of new key words or key phrases being identified, I used them to refine my search strategies and incorporated these new findings into my discussion and recommendations for future research.
3.6 Methodological Assumptions

The philosophical stance for data collection and analysis that I used for my study allowed me to incorporate my prior learning experience and practice in the pharmacy profession into my research findings. It was assumed that through the integration of my personal views and open contribution from different groups of participants in this qualitative study, new knowledge or concepts could be constructed and reconstructed in undergraduate pharmacy curricular development, particularly, the value and impact of co-op experiential learning on the professional and personal development of students.

Another assumption that I made in my research pertained to the accuracy of the participants’ self-reported perceptions. The co-op curriculum at the UW School of Pharmacy was the first of its kind in Canada. Participants in my study allowed me to capture first-hand information and experience from this new co-op program, as the students were the first cohort completing the four, 16-week co-op work terms; and the co-op employers and faculty members were the ones who engaged in the first-round administration of the program. There was not any pre-existing benchmark or comparative information available in the literature to challenge or defend the accuracy of the data collected from my participants.

At the beginning of my study, I made an assumption that students would develop certain skills (regardless of clinical, personal, or interpersonal skills) during their four, 16-week co-op work terms. Although this assumption was supported by previous studies conducted by Fletcher (1991), Ting et al. (2009), and Ieva et al. (2009), this preconceived notion was directly associated with the trustworthiness of my study. Hence, triangulating the three sources of data from pharmacy students, co-op employers, and faculty helped justify the credibility of the final interpretations in my study. In addition, I also applied triangulation in my data analysis, during
which I worked with two other researchers (BM and AK). We conducted the analysis, first individually, and then we compared our codes and themes before arriving at my findings and interpretations (Carlson, 2010). In general, we agreed on most of our codes and themes; through iterative discussions and negotiations, we were able to make modifications to our themes and finally arrive at a consensus.

3.7 Limitations

A common limitation of qualitative case study is the lack of generalizability of research findings to other domains or settings. Yet, generalizability is typically not the intention of qualitative research (Glesne & Peshkin, 1992; Sutton & Austin, 2015). In this case study, I used a purposive sample in a particular school of pharmacy, and no claims of generalizability are made based on my research findings.

Owing to my affiliation with the UW School of Pharmacy, I was not able to personally conduct the semi-structured interviews with the students. Instead, I relied on a representative (a research assistant [BM]) to collect for me the data generated by the students. A possible limitation of this process was that, as the researcher, I missed the first-hand knowledge of the facial expressions and body language of my participants (that is, students) when they responded to the interview questions. Yet, this was the only way to avoid potential ethical implications and perceived coercion, as I might have known some of the students because I taught these students between 2008 and 2010.

In addition, my leading of the faculty focus groups, which was unpreventable, might have affected the faculty members’ responses to some extent. However, since I had not been, was not at the time, and would likely not be in a line relationship with any of the faculty participants, it is reasonable to assume that this was not a strong limitation.
Finally, there were potential and unavoidable biases that I might have during the planning, implementation, and data analysis of my research due to my prior learning experience in a pharmacy school without a co-op component and my practice as a pharmacist in the last 20 years with pre-defined notions of educational and professional competencies embedded in my mind unconsciously. Therefore, I urge readers to use their own discretion when determining the relevance of my research findings to their specific contexts or practice settings.

3.8 Ethical Issues or Considerations

This study served as my Ph.D. dissertation at the Ontario Institute for Studies in Education at the University of Toronto; and since the site of this study was at the School of Pharmacy, University of Waterloo, I obtained ethics review approval from both institutions before carrying out my research. In addition, the following information was communicated to participants via the recruitment and information-consent letters (Appendices B, C, and D).

Because of the uniqueness of the UW pharmacy program, in that it is the only undergraduate pharmacy program in Ontario that incorporates co-op experiential learning, it was not possible to anonymize the study site university. All participants are identified by code only (e.g., S for students; F for faculty, and E for employers); all coded lists are kept confidential and secure and only the Research Assistant has the list linking codes to the participating students’ names.

Participation in this study was absolutely voluntary. Participants were informed that they were free to decline to answer any questions that they did not wish to answer, and they could withdraw their participation by letting the Research Assistant or me know. Withdrawal was possible only until the data were aggregated and input from interviewees could be deleted if the participants withdrew before the data were aggregated. In the case of the focus group
discussions it was not possible to delete any input of individual participants prior to the withdrawal. None of the participants asked to withdraw.

There were no known or anticipated risks from participation. Any information that the participants provided was kept confidential and secure. The data collected, with no personal identifiers, were maintained on a password-protected computer in a restricted access area at the UW School of Pharmacy. They were electronically archived after completion of the study and will be maintained for five years and then erased. All information collected from participants was aggregated and coded. Thus, their names will not appear in any report, publication, or external presentation resulting from my study. Data were kept secure and were only accessible by me and the other two researchers (BM and AK) who had signed a confidentiality statement (Appendix H).

3.9 Summary

In this chapter, I described my research design and methodology, the site of my research, and explained my participant selection and data sources to answer my research questions. In order to establish credibility and trustworthiness for my study, I used the procedures of reflexivity, triangulation, audit trails, during the planning, implementation, and data analysis of my research, respectively. I also addressed how I obtained the content and face validity of my instruments for data collection, namely, my interview guide for pharmacy students, my telephone interview guide for co-op employers, and my focus group discussion guide for faculty members. I worked with two other researchers (BM and AK) when conducting my data analysis, first individually, and then followed by a comparison of our findings and interpretations. I concluded this chapter with a reminder to the readers regarding the assumptions that I made in my
methodology, limitations that were inevitable in my study, and the ethical issues that I had considered for my research.

The role of pharmacist evolved and expanded in last decade. The NAPRA *MSOP for Canadian Pharmacists* (2009) clearly stated that pharmacists must have both clinical and interpersonal skills. To ensure that new graduates were well equipped with competencies and skills for patient-centred care, it was important that pharmacy students were offered the opportunity to develop their skills in a well-balanced manner. Incorporating experiential learning into the pharmacy curriculum was one way to do so, and this was supported by various studies. Using an exploratory descriptive case study of the first graduating class at the UW School of Pharmacy, my research attempted to use a constructivist lens and explore the co-op experience of undergraduate pharmacy students in Ontario, Canada, with a focus on its influence on the students’ professional and personal development. Findings of my study identify conditions or contexts that might contribute to Kolb’s experiential learning theory.

Next, in Chapter 4, I present a description of my study site, my participants – pharmacy students, co-op employers, and faculty members of the UW School of Pharmacy together with my data analysis and research findings.
Chapter 4
Presentation of Findings

My dissertation was an exploratory descriptive case study of the first graduating class of undergraduate pharmacy students at the UW School of Pharmacy who graduated in August 2011, often referred to as the Rx2011 class. The purpose of my research was to learn more about the cooperative experience of pharmacy students.

The co-op curriculum at the UW School of Pharmacy was the first of its kind in Canada (About the School of Pharmacy, n.d.). In order to capture first-hand knowledge from the Rx2011 class of students who had completed their four, 16-week co-op work terms, I used a purposive sample in my study. Other groups of individuals who were involved in the first-round implementation of the co-op program – co-op employers and faculty at the UW School of Pharmacy – were also participants of my study. Alternatively, one might view that I used theoretical sampling, as my approach of seeking perspectives from co-op employers and faculty members in addition to pharmacy students in my research, was inspired by previous studies by Swanson et al. (1982), Martin (1998), and Brown et al. (2005). Regardless, triangulating multiple sources of data from different types of participants would help substantiate the credibility of my research findings.

4.1 Description of the Study Site and Participants

The University of Waterloo (UW) is located in Kitchener-Waterloo, southwestern Ontario, Canada. Since its inception in 1957, it has established six faculties and 10 faculty-based schools, of which the School of Pharmacy is under the Faculty of Science; currently it has 30,600 undergraduate, and 5,300 graduate students, as well as 1,139 full-time and 322 international faculty members (About Waterloo, n.d.). UW is universally recognized for its computer science,
mathematics, and engineering programs. In addition, it is “the largest post-secondary co-op program of its kind in the world” (Co-operative education, n.d.) with 19,000 co-op students enrolled in more than 122 programs. Today, over 5,000 employers hire co-op students from the UW (Co-operative education, n.d.).

The School of Pharmacy was founded in 2007. It is situated in downtown Kitchener, Ontario, Canada, and is part of the Health Sciences Campus of the University of Waterloo, adjacent to the Waterloo Regional Campus of the McMaster University’s DeGroote School of Medicine and a family health team. Therefore, pharmacy students have the geographic advantage of being very close to a real clinical practice site where they can provide care to patients together with an interdisciplinary team of health care professionals (About the School of Pharmacy, n.d.). Each year the School of Pharmacy admits 120 students to the first year class of the four-year undergraduate pharmacy program. Unlike other traditional undergraduate programs that start in September, the UW pharmacy co-op program starts in January of the first year and finishes in August of the fourth year in order to accommodate the sequencing of the academic and co-op work terms and the subsequent admission cycles (Frequently asked questions, n.d.).

The UW School of Pharmacy is currently the only undergraduate program among all schools of pharmacy in Canada that comprises a mandatory co-op component integrated throughout the four-year curriculum (Figure 1; About the School of Pharmacy, n.d.). The first cohort of pharmacy students (i.e., the Rx2011 class) was admitted to the program in January 2008 and students graduated in August 2011 with a BScPhm co-op degree designation. There were 88 students in the Rx2011 class.

Nineteen (22%) students from the Rx2011 class responded to my invitation and participated in semi-structured face-to-face interviews with my representative, Research Assistant (BM) (Figure 4). Sixteen of those who responded were female students, and only 3
were male students. The ages of the respondents ranged from 19 to 37 years old, with an average age of 27. Majority of them had six to eight years of university studies prior to their admission to the UW School of Pharmacy. Their co-op experience included a mix of community and hospital pharmacy practice settings, as well as primary care in family health teams or community health centres, and non-traditional workplaces such as pharmaceutical industry, government agencies, and professional associations. While students’ co-op experiential learning took place primarily in community pharmacies, this reflected the real pharmacy job market where most pharmacists were practicing in community settings (Ontario College of Pharmacists, 2014).

Twelve co-op employers participated in the semi-structured telephone interviews (Figure 4). The majority (n=8) of them were female pharmacists. Most of these co-op employers who agreed to be interviewed practiced in primary care clinics and non-traditional sites.

I recruited 12 faculty members from the UW School of Pharmacy to participate in two focus group meetings (Figure 4). The first focus group consisted of five faculty members (three male and two female faculty members) with an average of 4.6 years of teaching experience in higher education. They taught students of the Rx2011 class on a variety of courses, including biomedical sciences and pharmacy practice. Three of them were full-time faculty members. They did not employ any pharmacy students as co-op students at the UW School of Pharmacy. The second focus group consisted of seven faculty members with an average of 6.7 years of academic teaching. The expertise of this group, with two males and five females, was on clinical pharmacy practice and the therapeutic use of medications. They were clinicians and had direct patient care practice off-site in addition to their academic appointments at the UW School of Pharmacy. Hence, most of them were familiar with and had experience with hiring pharmacy co-op students at their clinical practice settings. Figure 4 depicts the distribution of study participants.
4.2 Perspectives of Students

Pharmacy students (S) self-reported several behavioural changes as a result of co-op experiential learning. These behavioural changes were associated with non-clinical skills, such as their confidence in being assertive, taking control of a task, and recognizing the importance of professionalism and ethics in real-world practice; for example, student S3 perceived that “what I learned about professionalism and ethics is that it’s a very personal thing and every pharmacist approaches it differently. It was very helpful to see different pharmacists in different scenarios” (S3).

4.2.1 Confidence

After completing the four, 16-week co-op work terms, students felt that they were exposed and engaged in various aspects of pharmacy practice and they were confident that they left each co-op with certain skills acquired. For instance, student S15 shared that “I feel more
comfortable now going out into pharmacy now, than I would have without co-op” (S15) and student S6 stated that:

I think the co-op definitely gave me the confidence to go into an interview and say ‘this is what I've done.’ I have 16 months of pharmacy experience; eight in each [of community and hospital pharmacy practice]. I've seen a bit of everything. I think they expect that you'll learn from seeing on the job. And that's the same as with any co-op. You don't come in with all the skills, but you leave with them [italics added]….The intent is that by the time you've completed it, you'll be comfortable in your surroundings. (S6)

Another student S4 also found that “my comfort level with patients surprised me after a while, and that comes with confidence” (S4). Similarly, student S2 believed that “I got more confident in my therapeutics [and] my collaboration quality improved considerably” (S2).

Students also perceived that the skills they acquired from co-op were transferable and this was reflected by what student S10 shared with us, “I have the confidence to know what I'd need to learn or to re-direct my practice to fit into these settings. That's why I chose to go to Waterloo” (S10).

The above findings substantiated the assumptions that I made at the beginning of my study where students would develop certain skills (regardless of clinical, personal, or interpersonal skills) during their four, 16-week co-op work terms.

4.2.2 Self-discovery

Students commented that co-op experiential learning provided them with an opportunity to explore and learn more about themselves – both personal and career-related discovery. For example, student S19 stated that “I'm not scared to try anything new, because co-op has given me that confidence. But if I have to choose, I'd be more comfortable in a retail setting or a non-traditional role” (S19); student S8 believed that “after four co-op placements, you know where your line is. You know what's right and wrong. Some things are black and white, but you know where you stand on the grey” (S8); student S7 stated that “I really, honestly did not learn a whole
bunch about drugs on my co-op work terms. I learned a lot about life and life skills” (S7) and student S3 agreed that throughout her self-discovery journey:

I think I learned more about myself than I did about pharmacy as a whole. I had very diverse co-op experiences, so I developed a new skill set and learned new things about myself along the way. Such as what patient groups I felt comfortable, what groups I didn't feel comfortable with. What sort of an environment I want to work in when all is said and done. (S3)

Students perceived that co-ops helped them pave their career path or at least offered them the opportunity to explore the various roles that pharmacists could play in the health care system. Student S1 thought that what was “good about this program and co-op [is that] it's impossible to know everything, but you can know where to go” (S1). Another student S5 echoed that:

I didn't know when I started pharmacy what all the career options would be. With all these co-op experiences I know I want to have a clinical position. I don't want to have a community position, I don't want to dispense. (S5)

On the other hand, student S19 believed that co-ops gave her the options to explore the different fields in pharmacy practice:

I had already had exposure to community … before I entered pharmacy. So it was through co-op that I got exposure to non-traditional roles such as government and office jobs that I was involved with that I wouldn't have been willing to go to on my own as a career. So co-op gave me that four-month period to sort of 'try out' the job. (S19)

Student S2 discovered that personal growth and maturity would logically come with more real-life work experiences, as illustrated in the following comment:

When you work in a job from when you're so young, you have a lot of immaturities that can sort of fly when you're a student. But as you wanna [want to] mature and want people to have a different perspective of you; you need to change how you talk, how you act, and even how you dress. (S2)

However, at the same time, student S2 also recognized some personal limitations and areas of improvement and admitted that “I have an inherent flaw for the profession. I am a multi-tasker and I have poor attention to detail. So those are two issues. I mean I'm aware of them, so I'll be able to troubleshoot for them” (S2). Meanwhile, student S18 shared a similar perception:
I don't think I'm a bad communicator, but I had a lot of chances to interact with patients. There were a few times where I had a few ‘interesting’ interactions with patients and I would then go back to my office and reflect on those encounters. What factors might have caused things to not go well. Was it me, something external I could maybe work with some of the things that happen, prevent them from happening again? I had a chance to fix things. (S18)

On the other hand, student S17 learned about being open-minded and embracing a positive attitude towards the unpredictable nature of co-ops:

I think a lot of it was just always being open to everything around you. I know things might be a bit competitive here. But just being flexible with every job you get and being open to new opportunities. Not being depressed that you didn't get the job you wanted, but just being on the look-out for a new opportunity. I think learning is everywhere. Just go for the opportunity and learn everything you can. (S17)

Furthermore, student S14 was surprised about how much she learned about herself and this was evident from the following quote:

[It] was also a nice surprise because I never thought of myself as being very people-oriented; I'm very shy as well. To sort of bring out more, just confidence or something. Having people listen to you and seek your advice, it feels pretty good. (S14)

Essentially, co-op experiences offered students an invaluable venue to delve into their personal discovery while recognizing their strengths and weaknesses for individual growth and future career planning.

### 4.2.3 Career-related Discovery

Students appreciated the significance of interprofessionalism – collaborating with other health care professionals – in real practice settings and how effective communication played a positive role in patient-centred care. This was demonstrated in the following statement by student S5:

I think it was definitely a good practice being in co-op. It's one thing working with the students in your class, people who studied all the same material as you. When you're out there and you say something and everyone says ‘Oh, I didn't think of that.’ Or...Say for example the physiotherapist might be involved in a stroke case and they have a really good idea that you know nothing about. So it's an opportunity to learn about them and
their scopes of practice. So, I guess in all the placements I worked at, collaboration was a big part of the process. (S5)

Student S13 also found that although “I think I set out to get clinical experience… I think I got more interpersonal relationships is what I got from it [co-op]” (S13).

The real-world experience during co-ops made students aware that effective communication with patients came with practice. This was supported by a quote from student S1:

I think really just communication skills more than therapeutics. Like, you do learn about therapeutics on the job - drugs and that stuff. But how to interact with patients, how to communicate with them, you do learn a lot of that. More so than anything else, if you do a lot of counselling you do learn to pick up on those cues, that a patient is missing something or not getting it. (S1)

Students realized that for any tasks, including patient counselling, the more you did, the more you would be good at it. For instance, student S7 believed that “I learned a lot about making things relevant to other people [through practice]” (S7) and student S4 asserted that:

It's easy to learn the therapeutics and medications in school, through textbooks and that. But when you hear patients come up with questions and interpretations of treatments that you've never heard of; it's something you can't prepare for in school. So that's where co-op prepares you very well: dealing with the subtleties of patients but also the random stuff they come up with. (S4)

In addition, through co-ops, student S8 confirmed the type of professional career that she would like to involve; she shared that:

I've always wanted to be a community pharmacist. Some people may think I don't dream big enough, but I want to come into work and know who you are. I watched your kids grow up and you know who I am and you trust me to make recommendations. And when they do get it, when that light bulb goes off, they come back to thank me. That's what I want from my professional life, that's what I want. I want to be able to see their smile; I want them to be able to understand. Even if I get yelled at for 10 hours because patients aren't always the nicest, that one person will make it worth it for. That's what I want. (S8)

4.2.4 Constructive Feedback on Co-op Experience

Students expressed mixing feelings against the use of the PLOT to document their co-op experiential learning. Some used the PLOT to set their learning objectives for their co-op work
terms; some used it as a reflective tool. Students found that they had minimal opportunities to take on management and leadership roles during co-op, hence not very likely to achieve such competencies or learning outcomes as stated in the PLOT. For example, student S7 critiqued that:

It [PLOT] just wasn't user-friendly. I'm a big fan of reflecting and journaling, and when I look back on those old PLOT entries I'm like ‘whoa, I forgot I did that.’ But I didn't use it effectively. So as far as the PLOT it goes - for me, when I tried to apply it, I used it to set goals for the term. So I could say that ‘this is what I need’ from that semester. So with the [PLOT] in mind I could work to address that somehow in that term. I think every pharmacist was very receptive to that. (S7)

Students also speculated that the reality of the job market might not be the same as what they expected. In other words, co-op experiential learning might not always guarantee the diversities of employment opportunities or practice settings in real-world practice. This concern was supported by the following quote from student S4:

Well, I guess the job process in itself can be a little flawed in that it supports the same stream. So, if you get a hospital co-op early, it's likely that you're going to get another, because you have the experience; whereas if you get a job in community early on, and want to go to hospital, you're out of luck. So that gears people really early on. (S4)

However, students could potentially work with pharmacists and non-professional staff in a variety of work settings and in different geographical regions in Canada during their co-ops. For instance, student S7 mentioned that:

I thought that co-op was an absolutely vital part of this education. I couldn't imagine it any other way. It gave me a source of income. I moved to new a city that I otherwise wouldn't have gone to...It allowed me to explore new places in Canada. (S7)

In general, the variety and the unstructured nature of co-op were positively perceived by students. Students could try and experience various aspects of the job itself. This was best summarized by a quote from student S6:

One thing I liked about the co-op is you didn't have a defined role, so you could really do a bit of everything. One day you could go up to psych [psychology ward]. The next you
could follow the purchasing guy around. So I kind of like maybe not having a defined set of education goals you had to get. (S6)

In addition, student S10 found that “the biggest thing that co-op has given me is that motivation to keep learning because I see the benefits” (S10) and that “the different co-op experiences I've had really opened my eyes to the different industries in the profession” (S10); student S4 highlighted that “I learn a lot more from negative role models than positive. So, I guess I'm glad I had those experiences” (S4); and student S11 reflected that:

I learned from all of them. Looking back, I'm glad for all the experiences that I had. I would still do the same co-ops if I could go back. Looking back, all my experiences may not have been positive but I can turn them into positives. (S11)

4.2.5 Class Instruction Compared with Practice (or “the Real World”)

Students recognized the challenges in real practice setting during co-op experiential learning and contrasted what they learned in the classroom. They realized that co-op offered them the opportunity to not only apply what they learned in class, but also reinforce their understanding of patient-centred care and effective communication. For example, student S15 recognized that “school is good to actually learn the specifics, but co-op is good to learn how to actually transfer that to the patient” (S15) and student S9 shared a scenario of how classroom knowledge was nicely integrated into and substantiated by co-op experience:

[Co-op] increased my expertise by enforcing the principles I learned in school. Like, I saw 10 patients with diabetes. I spent one weekend cramming for a test, but after 10 patients, I don't even need to look up some of this stuff anymore. So maybe I memorized BG [blood glucose] targets for a test, but after 10 MedsChecks [comprehensive medication review with patients] I know it. (S9)

At the same time, students also realized that there was so much more to learn when they were out in real-world practice. For instance, through co-ops, student S12 was aware that “I should be comfortable with what I learned and that I'm not going to know everything” (S12) and student S19 discovered that:
When [you] go into co-op you think you know everything and then you realize how little you know. So when you come back as a student you're better prepared … and you ask better, more relevant questions [in class]. I think you're definitely a more involved student after co-op. (S19)

4.3 Summary of Student Perspectives

Two other researchers (BM and AK) and I reviewed 19 transcripts of student interviews. Data saturation was achieved after analyzing seven to eight transcripts; after that, the themes generated became repetitive. Overall, pharmacy students found that co-op experiential learning influenced their professional and personal development through increasing self-confidence, assertiveness, and their sense of responsibility. This finding was consistent with what Clouder (2009) discovered in a study of a BSc (Hons) physiotherapy program at Coventry University in the UK where students had two, 15-week practice-based learning that was integrated in between second and third year. Clouder (2009) posited that students’ “increased responsibility was … associated with increased levels of confidence, which [was] developed through patient contact, increased knowledge and increased independence” (p. 296).

Pharmacy students also recognized the importance of professionalism, ethics, and communication in real-world practice and during their interactions with other health care professionals when delivering patient-centred care. Co-op experiences offered them a unique opportunity to explore and learn more about themselves, whether it is personal or career-related. In a study of social work students from a graduate college in Texas, United States, Taylor and Cheung (2010) stated that self-awareness was an aspect of self-discovery and “self-awareness is the key to facilitate effective communication with clients [patients]” (p. 161). Through self-discovery, students should be able “to fulfill the multifaceted expectations of the profession (Taylor & Cheung, 2010, p. 171). Similarly, pharmacy students realized the difference between classroom learning and real-world practice where co-ops reinforced their classroom knowledge
and reaffirmed their understanding of patient-centred care. While acknowledging the flexibility, versatility, and the relatively unstructured nature of co-ops, students were ambivalent towards the application process for jobs available for their work terms and the PLOT documentation required during their work terms.

4.4 Perspectives of Co-op Employers

Co-op employers (E) were interviewed subsequent to data collection from students in the fall of 2011. Since they resided in different geographical regions in Ontario, telephone interviews were conducted for logistical reasons. Two other researchers (BM and AK) and I reviewed the co-op employer transcripts independently and compared our findings against the thematic analysis of the students’ interview data. We identified two main themes or open coding (Glaser & Strauss, 1967) – individual growth and mismatch between expectations of co-op and curriculum – to represent our findings from co-op employers.

It was important to note that this group of co-op employers primarily practiced in primary care clinics and non-traditional sites, such as, pharmaceutical industry, government agencies, or professional associations. Hence, they were not an ideal representation of the pharmacy workforce where majority of pharmacists practice in community settings (Ontario College of Pharmacists, 2014).

4.4.1 Individual Growth

4.4.1.1 Professional and Personal Growth

Co-op employers found that depending on the students’ motivation and personality, some might take on more initiatives and want to be more involved in various tasks at the job. However, some students might need more directions from the employers. A co-op employer E1 shared an
experience where the student had a quiet personality and required a bit more assistance and encouragement from the employer for inter-professional collaboration:

The student I had was probably a little bit more quiet, a little bit more…not so outgoing. So I think some of the tasks I gave…to focus on that collaboration, some education sessions I had them do, working with the doctors…all kind of help to improve that a bit. (E1)

Another co-op employer E10 noticed that students “realized that they must work hard to move forward as well. Out of seven [students], two of them were average development but still they have improved significantly during the rotation” (E10).

The degree of students’ professional and personal development varied, as this was very individualized, according to the co-op employers. Some students could be very motivated and self-directed, but some could be quite reluctant to learn and reflect. For example, co-op employer E2 recalled that:

We had six to eight students that worked with us. Two of them may not have gained a lot of skills. One of them did what they were asked to do but did not go further. We found that we had to assign low-level typed tasks. She didn’t operate at a higher level. The other person was resistance to feedbacks. They may not have the insight to see that feedbacks could be positive and they might be able to improve if they thought about the feedbacks. Other students who when you gave them feedback, you could clearly see they have incorporated and changed the ways they were doing things and tried to improve. (E2)

Co-op employer E10 also provided the following example:

One of my students was a bit lazy and he just worked eight-to-four shift. Basically we had heavy discussion….if you want to be a factory worker, you can work in a factory. When you take care of patients, you basically have to do until you have nothing to do [with them] and then go home. It’s an issue in professional development and I see improvement in patient care. He’s no longer four o’clock rings and leaves. He starts taking responsibility as a pharmacist for what’s happening. I saw improvement. (E10)

Co-op employers perceived that the degree of autonomy students had would impact how much they learned and experienced during their co-op work terms. Co-op employer E2 shared her experience and commented that:
In terms of pharmacy practice, they all gained exposure….It depends on the students how autonomous [italics added] they could be because there is one student who never went beyond to what was assigned but another student was like when I asked her if she could do this but she said that she did it yesterday because she was thinking ahead and predicting what it needed to be done. (E2)

On the other hand, co-op employer E12 also had a similar perception and recognized that:

It's really up to the student to try to get an understanding of the whole profession. It's a different working environment. The co-op program offers the students a different opportunity. You get to know; get to learn the practical side of pharmacy, not just the textbook application. With the many [co-op] terms, it gives you a chance to really go farther and get a sense of what the profession is about. (E12)

### 4.4.1.2 Intellectual Growth and Soft Skills

In general, employers suggested that co-op experiential learning offered a reality check for students and stimulated their intellectual growth and development of soft skills, such as project management, communication, teamwork, and collaboration. What was unique regarding the co-op model was that, employers could usually observe the change or growth in students in a four-month work term. For example, co-op employer E8 observed that students “students develop a keen awareness of pharmacy….they really leave here with a greater sense of where the pharmacy profession is going and the challenges that lie ahead” (E8); and co-op employer E3 recognized that:

There is definitely personal growth by the time they leave. I think they leave feeling they've accomplished something. I think they gain self-confidence. Because in school, it's all bright colours. You come out thinking you'll be the messiah of pharmacy, I know I did. It all changes once you hit the real world, not negatively but differently. It's a reality check [italics added]; one thing they learn is reality. They have a live patient, not an actor. (E3)

In addition, co-op employer E9 justified that the extent of intellectual growth of students during their co-op work terms might depend on their baseline aptitude:

To push them [students] from a 50% to 75% is relatively easy compare with from 99% to 100% and that one incremental percent is difficult. So yes I do see intellectual growth. So some students who may not start with a high intellectual capacity might benefit from the [co-op] rotation….Some students they will come in and I tell him that and two days later
they will get it and that will be it. Other students will take longer time. It is those students you will see more tangible growth. (E9)

Throughout a four-month period, students could also achieve a variety of soft skills with respect to patient-centred care, such as, patient counselling, documentation, evidence-based practice, and communicating in lay person language with real patients. This was supported by quotes from co-op employer E8, “the focus on writing skills, and communication skills. I've seen real growth in those areas” (E8); co-employer E10, “the skills that [students] developed were interpersonal skills, drug information skills, and communication skills with the team. I made them to do some projects, so they also developed organizational skills” (E10); and co-op employer E2, respectively:

Over the four months, she got better at doing the follow-up and monitoring and all the different tasks associated with their [patients’] stay including writing counsels, documenting concisely and clearly, supporting with evidence, developing and implementing clear monitoring plans and writing discharge reports and preparing medication information for patients at a language level they could understand. (E2)

On the contrary, co-op employers perceived that it was relatively challenging to identify such changes in students in a four-week rotation, which was a traditional model of structured experiential learning, offered by other schools of pharmacy in Canada. One co-op employer E3 mentioned that “[I preferred the co-op to the Structured Practical Experiential Program (SPEP)] because it's so hands on. I think the courses are so much more geared to help them [students] when they're actually working…. maybe it's because it's not as structured” (E3). Another co-op employer E10 shared a similar perception when comparing co-op with the traditional SPEP, “I find they [co-op students] are ready to work in a working environment compare to SPEP students in which I have to hold by their hands and tell them to do everything” (E10). Last but not least, co-op employer E12 echoed that “the co-op and its arrangement from an employer sort of perspective is a lot better than the traditional program” (E12).
4.4.2  Mismatch between Expectations of Co-op and Curriculum

4.4.2.1  Employers’ Expectations in Contrast to School’s Expectations

It was obvious that there was a discrepancy between the employers’ and the school’s expectations with respect to students’ co-op experiential learning. The school expected students to seek employment opportunities in various practice settings and provide care to different patient populations during each of their co-op work terms. However, employers preferred returning students in subsequent work terms, as this would save their costs and time in training new students. For instance, co-op employer E3 emphasized that:

I think co-op is good. What I’d like to see more is [students] returning a second time. Because you get more bang for your buck, so to speak….He [the student] knows the pharmacy. It's not like you have to re-train him again. He just walks in and takes over from where he left off. (E3)

Co-op employer E12 also suggested that the school should consider “how to structure the co-op program to make it more financially feasible for the students and the co-op employers” (E12), as there was no guarantee from the school that he would be matched with a student despite he posted a job description for hiring a co-op student for a specific work term; this could significantly impact his human resource management at his pharmacy.

4.4.2.2  Co-op is Unstructured

Co-op employers recognized the unstructured nature of co-op experiential learning and appreciated the flexibility and capability of assigning various tasks to the students who were technically paid employees and they were expected to carry out tasks assigned by their employers regardless. To some extent, employers believed that the student’s co-op experiential learning was reciprocally a realistic gain to them, as one employer E4 perceived that “when I
look at co-op, I think it [is] experiential – it works at both ends. So I think both the student and the employer get something out of it” (E4).

Some co-op employers also commented that it was easier for them to seek financial support from senior management for a four-month co-op position due to return-on-investment when compared to the traditional model of structured experiential learning, such as, Structured Practical Experiential Program (SPEP). For example, co-op employer E5 perceived that:

The advantage I see [for co-op students] is that you get a lot more gains back to the hospital than with the SPEP. So the SPEP is more theoretical kind of training, more scheduled. There's projects you can't assignment to an SPEP student that you can assign to a co-op student. (E5)

Despite the diversity of jobs available in JobMine, a database where students looked for and applied for co-op placements, the school was not able to assure that a student would end up having different types of co-op experiences in their four, 16-week co-op work terms. This was evident from a quote by co-op employer E7:

[The] ordering of [co-op] experiences is an important thing to look at. If someone does community all the way through and they don't get any hospital exposure [then] that's not the best thing. So maybe there's another way other than a co-op term to get that kind of exposure. (E7)

Furthermore, some co-op employers found that the school’s required tracking of students’ competencies and learning outcomes achieved during co-op was very much confined by the use of a relatively structured PLOT. This might not be an optimal way to capture the unstructured nature of students’ co-op experiences. Employers found that a more flexible and open-ended documentation tool might offer a better reflection of students’ professional or personal development during their co-op experiential learning. For instance, co-op employer E11 critiqued that “in terms of patient care and drug distribution, that’s not really applicable and the same with drug information, education, and health promotion. It’s really indirect [in my co-op practice setting]” (E11); and co-op employer E7 reflected that:
It's kind of hard for me because a lot of the PLOT doesn't really apply to my [co-op] setting…. some settings have patient care and non-patient care tools, and maybe that's something that could be explored, because it [the PLOT] much more applies to the patient care setting. (E7)

4.5 Summary of Co-op Employer Perspectives

Two other researchers (BM and AK) and I reviewed 12 transcripts of co-op employer telephone interviews. Similar to the student interview data, saturation was achieved after analyzing seven to eight transcripts. However, this group of co-op employers, unfortunately, did not really represent the pharmacy workforce in Ontario, Canada, where majority of pharmacists practice in community settings (Ontario College of Pharmacists, 2014); and in fact, most of the time, students’ co-op experiential learning took place in community pharmacies as well.

Co-op employers perceived that there was definitely professional, personal, and intellectual growth in pharmacy students during and at the end of each of their four, 16-week co-op work terms. However, such individual growth was related to the student’s personality, motivation, and autonomy. Likewise, different personality traits might account for “different, individual specific learning styles” (Austin, 2004, p. 13). Austin (2004), in a study of 166 Canadian pharmacists for possible associations between learning styles, using Kolb’s Learning Styles Inventory and the Pharmacists’ Inventory of Learning Styles, career choices, roles in pharmacy practice, and preferences of teaching modes, asserted that there was a statistically significant correlation between a pharmacist’s learning style and teaching method preferences. In addition, one-on-one teaching and coaching, which was commonly found in experiential learning, seemed to be well received by pharmacists regardless of their learning styles (Austin, 2004). Essentially, the extent of individual growth of pharmacy students as a result of their co-op experiences might be related to their personality, their learning styles, as well as the dynamics
and interactions among the student, the employer, the environmental contexts, and the overall nature of the student’s co-op placements.

Although appreciating the unstructured nature of co-ops and the flexibility of assigning various tasks to the students, co-op employers’ expectations, sometimes, were not aligned with the school’s curricular intentions. From a financial point of view, co-op employers preferred the same students returning to their workplace in subsequent work terms, as this would avoid the cost of training. They also would like the school to ensure the employment of a student whenever they posted a co-op position for the sake of budgeting and human resource management. On the other hand, the school encouraged students to seek different types of co-op placements for each of their four, 16-week co-op work terms. While a co-op employer might not be matched with a co-op student through the school’s hiring process, students were not guaranteed to be employed by different types of practice settings in each of their co-ops either. Co-op employers recognized that the sequence of co-op experiences for students and the financial sustainability of the co-op program for both the employers and students might be worth further exploring. In addition, co-op employers found the PLOT that was required by the school for documentation of students’ co-op learning outcomes was not flexible or comprehensive enough to fully reflect students’ professional or personal development during their co-op experiential learning.

4.6 Perspectives of Faculty

I conducted two focus groups with 12 faculty members – five participated in the first focus group (FG1) and seven in the second focus group (FG2) – during the summer of 2011. Similarly, two other researchers (BM and AK) and I reviewed the faculty focus group transcripts independently and compared our findings against the thematic analysis of the students’ interview data. We generated four main themes or open coding (Glaser & Strauss, 1967) from the data to
represent our findings from the faculty members. With a small number of participants in each of
the two focus groups, the faculty members generated rich discussion. However, I had to admit
that, being a colleague of my participants, my presence during the focus groups, which was
unavoidable, might affect the faculty members’ feedback to my questions to a certain degree
(Anderson, 2010).

4.6.1 Integration of Knowledge between Classroom and Work

Placements

4.6.1.1 Pros and Cons of Co-op

Faculty members shared their viewpoints on the impact of co-op experiential learning in
students’ integration of knowledge acquired from classroom and work placements. Faculty
members from the first focus group had a generally positive attitude towards co-op. They
believed that classroom learning was re-enforced during co-op placements where students:

Have the background knowledge when they're in co-op…. then they bring that learning
back to us when they write their jurisprudence exam. So it's really good to have them
learning everything here, then going out there and seeing how all the puzzle pieces fit….I
really see that as a whole when they come back because they really work a lot better.
(FG1)

On the other hand, co-op experiential learning increased the quality and quantity of class
participation. Faculty found that co-op did increase students’ confidence to participate in class.
One faculty member commented that, “you can see that with people [students who had been] in
their co-op, they tend to ask with a sort of more questions related to patient care and so on. You
can definitely see that in a change” (FG1); another faculty member noticed that “their [students’]
co-op experiences provide a lot of opportunity to teach in class” (FG2). When it came to hands-
on activities, such as lab work at the school, a faculty member realized that co-op did make a
difference in the students’ competencies and skills:
When I see these guys [students] in first year and they go into a compounding lab section they don’t have a clue. They’re burning their hands on hotplates and they’re breaking beakers….In the end when you see them taking what they’ve learned, the jump I see in third and fourth year is huge. And it’s more than I would expect to see come out of traditional, course-based learning. Some of that obviously has to come out of their co-op experiences. (FG1)

However, faculty members from the second focus group provided a slightly different view of the co-op model. They expressed concerns that some students might have picked up “bad habits” from certain employers or preceptors and the school might need to “reset” or “de-program” some of these undesirable skills that students adopted during their co-op work terms. For example, one faculty member provided the following example:

I had a co-op student who essentially because of her previous co-op work terms I think I had to spend a lot of time un-teaching her stuff. I think that's one of the risks and problems with a[n] [unstructured] co-op program. When you look at some of the other university programs because there so much more structured. (FG2)

Another faculty member also raised a similar concern that “I reach the point sometimes where I'm scared of what the students are learning on co-op. We can't guarantee the quality of the precepting, or I guess, supervising is the right word…that these students are getting” (FG2).

Correspondingly, one faculty member cautioned that “we [faculty] don't necessarily have control over what knowledge they're gaining. So it could be good or bad knowledge” (FG2). At the same time, faculty believed that sometimes students did require some guidance and directions during their co-ops, especially when it came to patient-centred care. One faculty member shared the following experience and recalled the conversation that he once had with a co-op student:

It's been hit and miss. Some students have come in with a pretty good head on their shoulders with regards to these issues, but…. they're still too drug-focused. I've said to students, ‘You know, it sounds silly, but you're too drug-focused. You're not focused on the patient.’ I said, ‘You need to forget about the drugs upfront when you're looking at a patient. You'll get to the drugs.’ (FG2)
4.6.1.2 Co-op Experiences are Preceptor- and Site-Dependent

Faculty members acknowledged that students’ professional and personal development was, to some extent, preceptor-dependent. For instance, one faculty member perceived that “depending on the site or the preceptor, the attitudes [of students] could be pro or con. Again I’ve seen some students who have gain really poisoned attitudes” (FG2). Another faculty member shared the following example:

In first year, [a faculty member] set up what she calls a ‘shopper exercise.’ What the students do is they go to a pharmacy with a minor ailment and they ask the pharmacist for help with a product available for self-selection….There are some pharmacists out there not practicing at the level we want to train our students for. So if you consider that those are the people mentoring our students on patient care during their co-op experiences, then you’ve got to temper your expectations a little around what they’re gonna [going to] get out of that experience…. And we can't train those people [pharmacists], so it really comes down to who's hiring. (FG1)

Students’ co-op experiences were also site-dependent. The environment where students had their co-ops might influence the type of skills they acquired. A faculty member believed that:

It [student’s co-op experience] depends on where they work….Some people [students] come back, and in my professional practice class we talk about patient assessment. So some people [students] have some experience and have already seen these things so they can contribute. Other people [students] who may have worked at head office somewhere have developed different skills; they don't necessarily see all the patient care skills that other students have…. I think it depends a lot on where they go and how they're used. (FG1)

4.6.2 Unstructured Nature of Co-op

Faculty members realized that due to the unstructured nature of the co-op work terms, there was no guarantee that all professional or educational competencies that were expected in an entry-to-practice pharmacy program could be satisfied solely by students’ co-op experiential learning. One faculty member suggested that, “maybe, in time, we should define some of the outcomes we expect out of co-op; like from a preceptor to a student” (FG1).
4.6.2.1 Co-op Experience is Inconsistent

In fact, the inconsistency of co-op work placements, including a diversity of non-standardized co-op employers, might impact the potential and opportunity for students’ learning as well as their professional and personal development, according to faculty members. Once again, faculty members reinforced that students’ co-op experiences were very much preceptor-and site-dependent. In particular, faculty perceived that patient care skills might be better for students to learn and realize through a structured experiential program, such as, the traditional Structured Practical Experiential Program (SPEP):

I think co-op delivers on everything else, except patient care. Not to say that they [students] don’t get any, but compared to an SPEP rotation where you have a structured practical with a pharmacist preceptor teaching you these skills. Students on co-op kind of have to learn on their own, and I think co-op does a disservice to them in this respect. (FG1)

However, faculty members expressed their support to students taking the advantage of co-op to appreciate the diverse nature of the pharmacy profession, despite the fact that the PLOT outcomes did not essentially capture the diversity of the professional competencies. They recognized that it was essential to align teaching and learning between classroom and co-op experiential learning, but not necessarily to modify co-op to become a fully structured experiential model.

4.6.2.2 Debrief by Faculty Members

Recognizing the unstructured nature of co-ops and the inconsistencies of student co-op experiences, faculty members acknowledged the value of having a discussion or a feedback session with students during class, especially after they returned from their co-op work terms. One faculty member often took “a teachable moment [in class] to debrief with the student so that they can integrate” (FG2). Another faculty member echoed that:
I don't think a lecture period goes by that I don't ask, ‘What did you see on co-op regarding whatever? What did you hear the pharmacist telling patients about this on co-op?’ It's just an opportunity to say that was good or that a better or different way to look at that would be. (FG2)

4.6.3 Maturity or Professional Growth

Faculty members found that “[students from the Rx2011 class] are a very mature group and they have a very diverse background in terms of their experiences in co-op. Their experiences are in different practice settings, so that's probably due to co-op” (FG2). Faculty members were pleased to see that students acquired maturity throughout their four, 16-week co-op work terms. A faculty member who had hired pharmacy co-op students at her clinical practice site shared her experience of having a co-op student who demonstrated a progression in maturity and independence throughout her co-op work term. The student was comfortable to practice alone, make appropriate judgements, and counsel patients on sensitive topics in the following scenario:

She [pharmacy student] was placed in an emergency room. The pharmacist was nowhere near her. So she was working alone pretty much. She developed these fabulous interview skills and had a level of confidence that wasn't cocky. Like she knew that this was a dangerous situation, she didn't have a lot of knowledge. So she disciplined herself to go get help when she needed it….I see the maturity. She was able to as a young girl speak to an older gentleman about erectile dysfunction without any discomfort. Part of that was I think the amazing level of autonomy she had in that placement. (FG2)

In addition, faculty members agreed that co-op placements facilitated students’ professional growth. They identified student maturity through observations in the classroom. Students were more confident and proficient in prioritizing clinical decisions at school. As a result of co-op experiential learning, faculty members found that students had improved their organization and time management in performing assigned tasks in class, because students “learn some basic skills like time management, organizing, work-flow, those kinds of things; those extra skills that are non-pharmacy related [during their co-ops]” (FG1).
4.6.4 Ownership of Learning

Faculty members recognized that students had acquired confidence in taking ownership of their learning due to their co-op experience. A faculty member shared that:

I have had a few students say, ‘do you know anyone who wants a volunteer so I can spice my skills up on X, Y, Z?’ So they gain another experience before co-op, not paid, just helping someone connected to the school. I think the only reason they're doing that is because of the co-op. If they didn't have the co-op, they wouldn't know ‘hey, I've got to make these IVs [intravenous solutions]’ or whatever. They know from co-op that they can improve these skills early rather than at the end. (FG1)

At the same time, faculty members recommended that students should be discerned about what they adopted from their co-op experience, that is, less passive about the knowledge and skills acquired from their employers or work placements. In order to reconcile the potential discrepancy between the unstructured, inconsistent, preceptor- and site-dependent nature of student co-op experiences and what was taught in the curriculum, faculty members strongly supported and encouraged students to take responsibility of their learning:

Even though the co-op is really great for them [the students], they learn so much, when they come back they have to know ‘this is my education, I've got to take responsibility for this.’ They need to know what they need to improve on; they should be making a list ‘this is what I need to learn in my next co-op.’ I know they do a lot of reflections, but they have to take responsibility. Y’know [you know], picking up the pace and getting help when they need it. (FG1)

4.7 Summary of Faculty Perspectives

Two other researchers (BM and AK) and I reviewed the two transcripts of the two faculty focus group discussions. The first focus group consisted of five faculty members and the faculty members taught students of the Rx2011 class on biomedical sciences and professional practice. They did not employ any pharmacy students as co-op students at the UW School of Pharmacy. The second focus group consisted of seven faculty members who were also clinicians and had direct patient care practice off-site in addition to their academic appointments at the school.
Hence, most of them had experience hiring pharmacy co-op students at their clinical practice sites outside of the school. I, being a colleague of this group of participants, conducted the focus groups; and my presence might, to some extent, affect the faculty members’ discussion (Anderson, 2010).

Faculty members had mixed reviews of students’ integration of knowledge between classroom and work placements. On one hand, they believed that classroom learning was re-enforced because of students’ co-op experiences and students showed more interest and participation in class after they returned from their co-ops. On the other hand, they also expressed concerns that students might inherit some undesirable skills from their employers and work placements; and when they returned to school, faculty would have to re-train them and guide them back to the right track.

In general, faculty members were aware of the unstructured, inconsistent, preceptor- and site-dependent nature of student co-op experiences. While they recognized that it was essential to align teaching and learning between classroom and co-op experiential learning, it was not necessary to convert co-op into a fully structured experiential model, like the traditional Structured Practical Experiential Program (SPEP) in Canada (Hall, Musing, Miller, and Tisdale, 2012). In fact, they saw the value of having a discussion or a feedback session with students during class, especially after they returned from their co-op work terms. These would serve as invaluable teaching moments with students.

Faculty members were pleased to see the maturity and professional growth in students throughout their four, 16-week co-op work terms. As a result of co-op experiential learning, faculty members found that students had acquired non-pharmacy related skills, such as, self-confidence, prioritization, organization, and time management.
Finally, faculty members perceived that students took ownership and responsibility of their learning due to their co-op experiences, of which they strongly supported and encouraged.

4.8 Summary

The purpose of my research was to learn more about the cooperative experience of pharmacy students through an exploratory descriptive case study of the first graduating class (i.e., the Rx2011 class) of the UW School of Pharmacy. In order to capture first-hand information and experience from students who had completed their four, 16-week co-op work terms, I used three sources of data from key stakeholders of the co-op program, namely, pharmacy students, co-op employers, and faculty members at the UW School of Pharmacy. At the same time, triangulating multiple sources of data from different groups of participants would enhance the trustworthiness of my research findings presented in this chapter.

Data collected from 19 pharmacy students, 12 co-op employers, and 12 faculty members were transcribed, reviewed, and analyzed with iterative discussion among myself and two other researchers (BM and AK). We came to a consensus of a list of open coding categories (Glaser & Strauss, 1967) (Figure 5), of which the categories representing the employers’ data and the faculty’s viewpoints were derived after comparing our findings against the thematic analysis of the students’ interviews.

In summary, I attempted to describe the experiential learning in undergraduate pharmacy curriculum at the UW School of Pharmacy by corroborating sources of information from pharmacy students, co-op employers, and faculty members based on a case study of the first graduating class of the school who had completed the four, 16-week co-op work terms. In essence, the co-op experience of undergraduate pharmacy students was unstructured, relatively inconsistent, and highly dependent on the site and the employer of the student placements. It was
no doubt that students acquired skills, pharmacy- or non-pharmacy related, due to their co-op experiences. Meanwhile, individual growth with respect to professional, personal, and intellectual development in students was also reported.

While the unstructured nature of co-op was generally appreciated, it was important to be aware of the potential discrepancy between what was taught in class and what was being done in real practice. Therefore, personal reflection, self-discovery, being responsible and taking the ownership of learning by students, together with the ongoing guidance and mentorship by the faculty in between student co-op work terms should always be encouraged. Lastly, we should not forget that employers did have a business agenda in mind, and ideally, they would like to see a return-on-investment, if possible, while taking part in the co-op component of the school’s experiential curriculum.

In Chapter 5, I address my research questions and make connections between the above open coding categories (Figure 5; Glaser & Strauss, 1967) through the use of axial coding. In addition, I attempt to create a story line to integrate the resulting axial coding categories (Creswell, 1998). Finally, based on my findings from this study and integrating my personal experience as a previous pharmacy student, a current practicing pharmacist, and a pharmacy educator, I propose model of co-op experience (Figure 7) integrated into the four stages of Kolb’s experiential learning theory. I also explain how my work could serve as a baseline or a benchmark for future research in experiential learning of undergraduate pharmacy students.
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<thead>
<tr>
<th>Source of Data</th>
<th>Main Themes on Open Coding</th>
<th>Subthemes</th>
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</thead>
<tbody>
<tr>
<td><strong>Pharmacy Students</strong></td>
<td>Confidence</td>
<td>Professional and Personal Growth</td>
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<tr>
<td></td>
<td>Self-discovery</td>
<td>Intellectual Growth and Soft Skills</td>
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<td></td>
<td>Career-related discovery</td>
<td>Employers’ Expectations in</td>
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<td></td>
<td>Constructive Feedback on Co-op</td>
<td>Contrast to School’s Expectations</td>
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<td></td>
<td>Experience</td>
<td>Co-op is Unstructured</td>
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<td></td>
<td>Class Compared with Practice (or</td>
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<td></td>
<td>“the Real World”)</td>
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<tr>
<td><strong>Co-op Employers</strong></td>
<td>Individual Growth</td>
<td>Integration of Knowledge</td>
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<td></td>
<td>Mismatch between Expectations of Co-op and Curriculum</td>
<td>between Classroom and Work Placements</td>
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<td>Pros and Cons of Co-op</td>
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<td>Co-op Experiences are Preceptor-</td>
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<td>and Site-Dependent</td>
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<td><strong>Faculty Members</strong></td>
<td>Integration of Knowledge</td>
<td>Co-op Experience is Inconsistent</td>
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<td>Unstructured Nature of Co-op</td>
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<td>Ownership of Learning</td>
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*Figure 5. Summary of open coding categories of data*
Chapter 5
Discussion

In order to explore the central phenomenon of co-op experiential learning and to find out its influence on the professional and personal development of undergraduate pharmacy students, I adopted an inductive approach when analyzing my data with an attempt to connect the open coding categories (Figure 5) and map out the relationship between them while considering the conditions, context, strategies of action or interactions and consequences (Strauss & Corbin, 1997), which I am going to present in this chapter. First, I will close the loop by addressing my research questions.

5.1 Research Question #1: How does co-op experiential learning influence the professional and personal development of undergraduate pharmacy students at the UW School of Pharmacy?

Data to answer this question were derived primarily from the semi-structured interviews of pharmacy students, supported by selected themes generated from co-op employer interviews and faculty focus groups. The unstructured, inconsistent, preceptor- and site-dependent nature of co-op experiential learning presented ample opportunities for pharmacy students to learn more about themselves, from self- and career-related discovery, to improving their confidence, time management, and organizational skills, of which they were not necessarily pharmacy-related. After undergoing the four, 16-week co-op work terms, students were more mature in making professional judgements and clinical decisions when delivering patient-centred care. Although the discrepancies between what was taught in class and what was experienced in real-world practice were unavoidable, the co-op experiences facilitated students to be responsible and
capable of taking ownership of their learning, so that they became self-directed and often took
the initiatives to address their areas of improvement.

Ideally, students would like to have four very different co-op experiences in different
pharmacy practice settings, working with a variety of health care professionals, but there was
really no guarantee that this would happen to all students. Hence, this was another unpredictable
aspect of co-op experiential learning. In essence, students could take control of certain aspects of
coop (such as taking ownership of their learning), but at the same time, their professional and
personal development might be subject to where they practiced and whom they worked with
during their co-op work terms.

Consequently, the role of ongoing personal reflections by students, which is the core
element of Kolb’s experiential learning cycle (Figure 2), and mentorship by faculty members in
between co-op work terms (i.e., Stage 3 of Kolb’s; Figure 2) should not be underestimated in
shaping the ultimate professional and personal development of undergraduate pharmacy students.

5.1.1 Mismatch between Perceptions of Students and Faculty

I heard more than once from faculty members and co-op employers that co-op
experiential learning is unstructured and inconsistent. However, it does not necessarily translate
into a negative experience to the students. Instead, it offers students the opportunity to explore
the diversity of the profession early in their career path. On the contrary, I experienced the
benefits of undergoing a structured experiential program where students were assured with the
opportunity to acquire knowledge and skills based on the required professional competencies and
educational outcomes of entry-to-practice of the pharmacy profession. This concurred with what
the faculty member believed that patient care skills should ideally be acquired through a
structured experiential program.
Being one of the adjunct faculty members at the UW School of Pharmacy between 2008 and 2014, I personally observed changes and progression of pharmacy students after they returned to school from their co-op work terms. In general, I was impressed by their maturity and professional growth, which was confirmed by the faculty focus groups, especially after students completed all of their four co-op placements and came back to their two final academic semesters on campus just prior to graduation (Figure 1).

However, I also recognized that the unstructured and employment nature of co-op might put students at risk of not achieving all the required competencies upon graduation. For instance, students mentioned that they had minimal opportunities to take on management and leadership roles during co-op. Perhaps faculty should be more involved in what students acquired from their co-op experiential learning and secure teaching moments in class in order to reinforce the learning objectives and competencies of the pharmacy profession. As such, a curricular model with structured and complementary unstructured experiential components for pharmacy students should be considered.

Despite the fact that students found themselves more confident in choosing their career path and providing patient-centred care in practice due to their co-op experiential learning, faculty members cautioned that students should also be responsible and take ownership of their learning and be aware of the unpredictable nature of co-op where they might adopt undesirable behaviours from non-standardized preceptors and sites. The reality check in the real world during co-op could be a double-edged sword to students, according to the faculty.

In summary, a take-away point from my findings, I perceived, was that the alignment of classroom knowledge and experiential learning was the responsibility of both students (in taking ownership of their learning) and the faculty (in directing and affirming learning objectives and outcomes prior to and after each and every co-op work term of the students). Perhaps, an ideal
curricular model would be a hybrid of both structured and unstructured experiential learning for pharmacy students.

5.1.2 Mismatch between Perceptions of Students and Employers

Being a current practicing pharmacist in the community, I often experience the tension between being an employer and a preceptor. I sometimes have to switch my “hats” when interacting with my pharmacy students at the workplace. On one hand, I need to ensure that the co-op student fulfilled the assigned tasks from our employers, as they were paid by the organization. On the other hand, I sincerely hope that students could learn and take away “something” – knowledge, skills, or attitude, pharmacy or non-pharmacy related – while being at work. This is based on my understanding that pharmacy is a life-long-learning career and pharmacists should always maintain a positive learning attitude. Therefore, I am delighted to report that students in my study did admit an improvement in their confidence and achieve self-discovery and career-related discovery due to their co-op experiential learning.

While students’ self-discovery was considered as part of their individual and personal growth, employers believed that such development was dependent on the students’ motivation and personality. In other words, there was no absolute guarantee that co-op experiential learning could always result in positive professional and personal growth in students. Even with career-related discovery defined by students, employers found that this could be very individualized. Personal traits, motivation, and individual learning styles might affect the degree of professional and personal development in students.

5.1.3 Mismatch between Perceptions of Faculty and Employers

While faculty members recognized the unstructured nature of co-op and encouraged students to take advantage of this opportunity to explore the diversity of real-world pharmacy
practice, that is, having their co-op experience with a variety of employers and in different work settings; co-employers, from a business point of view, preferred returning students, so that they could avoid the costs associated with new staff orientation and training at subsequent co-op work terms.

5.2 Research Question #2: What are the perspectives of pharmacy students, co-op employers, and faculty members towards the impact of co-op experiential learning on students’ professional and personal development?

My response to this question was drawn from all three sources of data – pharmacy students, co-op employers, and faculty members. While reviewing the perspectives of pharmacy students, co-op employers, and faculty members towards the impact of co-op experiential learning on students’ professional and personal development, I was able to map out the relationship between the main themes (Figure 5) by considering the conditions, context, strategies of action or interactions and consequences (Strauss & Corbin, 1997).

The conditions, as faculty members pointed out during their focus group discussions, were very much dependent on the employers or preceptors and the practice sites. These two factors were fundamental in setting an environment where students could take away a positive or a less desirable learning experience. The unstructured and inconsistent nature of co-op experiential learning might be further complicated by non-standardized employers or preceptors in the field (Ting et al., 2009), which made these conditions fairly unpredictable for students in each co-op work term. Yet, such uncertainty did stimulate students to be more cognizant and be able to take ownership of their co-op experiential learning through ongoing reflections. In other
words, these *conditions* in co-ops – co-op employers and co-op sites – helped strengthen the internalization of Kolb’s experiential learning theory, particularly Stage 1 and Stage 2 (Figure 2), in students as they progressed from their first to their fourth co-op work terms, while alternating between the academic semesters of the program (Figure 1).

The *context* of co-op experiential learning and hence the students’ subsequent professional and personal development was linked to the students’ motivation and personality, as observed by the co-op employers. Although faculty members believed that co-op placements had facilitated students’ professional growth, employers found that such growth was highly individualized and every student’s personal development was unique and likely to be character-driven, or dependent on the individual specific learning styles (Austin, 2004). In general, the extent of pharmacy students’ professional and personal development was associated with their personality, their learning styles, and often involved the interactions among the student, the employer, and the practice environment of the co-op placements. The *context* of co-op experiential learning (i.e., student’s motivation and student’s personality) would affect how and what students might acquire through the integration and consolidation of theory and concepts they encountered in co-ops and applied to practice and planning for their upcoming co-op work terms. Essentially, students’ motivation and personality were instrumental when students were undergoing Stage 3 and Stage 4 of Kolb’s experiential learning cycle (Figure 2).

The *strategies of action* or *interactions* in co-op experiential learning referred to the students’ expected integration of knowledge between classroom and work placements (observed by faculty members) and the reality check between what was learned in school in contrast to what was practiced in the real world (identified by both students and co-op employers). Every time when students went through JobMine, a database where students searched and applied for co-op placements, they not only experienced the competitiveness of the real-world job market,
but also realized their career development options, such as preferred practice sites and patient care areas.

The professional and personal development of undergraduate pharmacy students (i.e., the consequence) was generally identified through students’ self-reporting, faculty members’ observation in class after students returned from their co-op placements, and co-op employers’ observation at the workplace settings. Students discovered more about themselves during co-op and strengthened their self-confidence. This was further substantiated by faculty members who commented that students acquired confidence in taking ownership of their co-op experiential learning. In summary, the consequence of co-op experiential learning featured students’ self- and career-related discovery, as well as students’ confidence and ownership of learning. These factors were expected to be accumulated in Stage 1 (i.e., experience) of Kolb’s experiential learning theory (Figure 2) as students went through their four rounds of co-op cycles.

5.3 Implications for Practice

My research findings were closely connected to my own contexts or experiences – that is, being a previous pharmacy student trained under a program without co-op but with a structured experiential component in the final year of the curriculum; a current practicing pharmacist; and a pharmacy educator. Removing or absolutely dissociating my personal preconceptions was almost impossible. Therefore, during my data analysis, I worked with two other researchers (BM and AK) in order to counteract my personal biases. Using a constructivist lens, I tried my best to incorporate my review of the literature, my prior learning experience and practice in the pharmacy profession into my research findings.

I was able to reveal the perspectives of pharmacy students, co-op employers, and faculty members towards the impact of co-op experiential learning on students’ professional and
personal development when attempting to connect the open coding categories using axial coding (Glaser & Strauss, 1967). I discovered an interesting central phenomenon – “mismatch” – between the different groups of participants in my study (Figure 6).

![Diagram showing the concept of mismatch](image)

Figure 6. A central phenomenon of “mismatch”

5.4 Implications for Theory

Based on my findings and the incorporation of my personal experience as a previous pharmacy student, a current practicing pharmacist, and a pharmacy educator, I consider the central phenomenon of “mismatch of perceptions” in co-op experiential learning (Figure 6), together with the *conditions, context, strategies of action or interactions* and *consequences*, and propose a model of co-op experience with key elements integrated throughout the four stages of Kolb’s experiential learning cycle (Figure 7).
What I learned from the faculty and co-op employers in my study was that co-op experiential learning is subject to several factors – the employers, the co-op sites, the student’s motivation and the student’s personality. The students’ professional and personal development self-reported by students and observed by faculty and co-op employers could be positive or negative, due to the unstructured and inconsistent nature of co-op experiential learning.

After completing a co-op work term (i.e., Stage 1 of Kolb’s experiential learning cycle in Figure 7), students reflect on their experience in Stage 2, where they should recognize that their experiences are very much dependent on their co-op employers and the sites of their co-op placements. In addition, the student’s individual motivation and personality, or perhaps their learning styles (Austin, 2004), might have already pre-determined the contexts or the baseline of how much and to what degree their co-op experiential learning, and consequently their professional and personal development would be. These aspects have direct influence on how...
students incorporate their theory and abstract concepts (in Stage 3) and apply their learning from previous co-ops for planning of future co-ops (in Stage 4). Owing to the employment nature of co-op, students were expected to carry out tasks as assigned by their employers. If students are motivated and self-directed as well as more engaged in their co-op placements to perform beyond their call of duty, it is possible that they may gain more than their peers who are relatively passive and only do what they are told during their co-op experiences.

When students are back to school in between co-op work terms, it is common for them to share their co-op experiences with their peers and faculty members in Stage 3 of Kolb’s framework (Figure 7). However, it is equally important for faculty members to check in with the students and take the opportunity to adjust the alignment of classroom knowledge and students’ co-op experiential learning. Both faculty and students should be fully aware of the non-standardized and unpredictable nature of co-op; and students are strongly encouraged to take ownership of their learning. Eventually, it is expected that students’ accumulated co-op experiences, as shown in Stage 1 (Figure 7), will be an amalgamation of confidence, self- and career-related discovery and ownership of learning.

5.5 Implications for Future Research

The further I explore about co-op experiential learning in undergraduate pharmacy programs in Canada during the course of my research and completing my dissertation, the more I realize that there are so much more for me to learn. Therefore, I recommend the following aspects for future research.

5.5.1 Suggestion for a Longitudinal and a Follow-up Study

Laschinger (1992) suggested that “a longitudinal study following [nursing] students through their educational program would be valuable in studying … perceptions of the
contributions of different types of learning environments to the development of these competencies [adaptive competency skills]” (p. 113). In hindsight, I administered my research at the final stage of the co-op curriculum for one class of pharmacy students who completed all four, 16-week co-op work terms. In other words, when I asked for their co-op experience and its influence on their professional and personal development, it was mainly based on their response and reactions at one point in time, that is, during the interviews. It was possible that students’ comments were based on recollections of their most recent co-op work terms; or there might be recall biases to a certain degree. A possible way to attenuate this potential bias is to conduct a longitudinal study where the researcher would follow the participants from the beginning of the curriculum, check in with the participants after each of the four, 16-week co-op work terms, document the findings, and analyze the results for the entire four-year undergraduate pharmacy program.

Linn (1993), when concluding her study of the role of work in an undergraduate psychology curriculum, mentioned that long-term effects of experiential learning might be “different in kind or strength” (p. 13). Therefore, a follow-up study could be conducted after my research with the Rx2011 class to see if their co-op experiences have any influences on their continuous professional development and career development.

5.5.2 Suggestion for an Experimental Study

One assumption that I made in my research was about the accuracy of the participants’ self-reported input. The co-op curriculum at the UW School of Pharmacy was new in Canada and there was not any pre-existing information available in the literature about co-op experiential learning in Canadian pharmacy schools. While my findings could serve as a baseline or benchmark, I suggest that some experimental studies would be worth exploring in the future.
Considering co-op experiential learning as the intervention, one option is to conduct a pre- and post-co-op experimental study of the same group of pharmacy students. Essentially, the same cohort of students will serve as the control and the experimental group. Students will be asked about their views on, for example, their professional and personal development as outcomes, prior to any co-op experiences; and they will then be surveyed or interviewed again after their co-op experiences. However, given the diversity of co-ops, it may be better to stratify students into pre-defined groups associated with the types of co-op placements they are engaged; it is also important to be aware of the various extraneous variables in this type of research, such as, student’s motivation and student’s personality (Figure 7).

Another type of experimental study would be comparing two different groups of pharmacy students, one who underwent a curriculum without a co-op component, and one with co-op, that is, similar to the co-op model at the UW School of Pharmacy. However, in the current Canadian undergraduate pharmacy landscape, almost all pharmacy schools have an experiential component in the curriculum. Although the experiential components in these pharmacy schools are not co-ops, students are expected to acquire certain skills, pharmacy-related or non-pharmacy-related, through these real-life, practice-based, and often structured opportunities. Such expectations are supported by previous studies by Fletcher (1991), Ting et al. (2009), and Ieva et al. (2009). Therefore, if this type of experimental study is carried out, the researcher needs to be highly cognizant of the underlying confounders, as it might be quite challenging to isolate the causal effects or the study outcomes, depending on what they are, due to students’ co-op experiences.
5.5.3 Research on Student Learning Styles and Co-op Experiences

In my proposed model of co-op experience (Figure 7), I illustrate that co-op experiential learning is subject to several factors, such as student’s motivation and student’s personality; and personal traits might affect the degree of professional and personal development in students. Austin (2004) posited that personal traits might account for individual specific learning styles. Hence, it would be interesting to apply the Pharmacists’ Inventory of Learning Styles (PILS; Austin, 2004) to pharmacy students, find out their individual learning styles – accommodator, assimilator, converger, or diverger – and follow their co-op experiences accordingly and, perhaps, longitudinally, to see if there is any association between student learning styles and co-op experiences.

5.5.4 Research on Peer-to-peer Interactions among Pharmacy Students

The driving force of Kolb’s experiential learning cycle in students is the ongoing self-assessments and reflections (Figure 7). The role of reflection on professional and personal development in students could be further explored after students “identified areas for growth and development [through their self-reflections]” (Ieva et al., 2009, p. 366). At the same time, we should not undermine the power of student-to-student interactions (within and between students) during co-ops, including student self-reflections and peer feedback. For examples, when pharmacy students are back to school in between co-op work terms at the UW School of Pharmacy, they usually share their co-op experiences with their peers, that is, during Stage 3 of Kolb’s framework (Figure 7). At the co-op sites, some co-op employers in my study revealed that they hired more than one co-op student at a time; and it is possible that some first-year co-op students would be working with their third-year peers at the same site in the fall work term from September to December (Figure 1). On the other hand, some pharmacists or employers might be
engaged in other types of experiential learning of pharmacy students from other schools at the same time while hiring a co-op student. Therefore, students have multiple opportunities to self-reflect and interact with their peers throughout their co-op experiences.

Keen and Howard (2002) recognized that “[gifted college] students found greater joy in learning while benefiting greatly from the stimulation of their peers who were having similarly, challenging co-op and service-learning experiences” (p. 138). Hall et al. (2012) proposed that “experiential training [for pharmacy students] should incorporate peer or near-peer learning methods, in which students assist in teaching, training, and supervising other students” (p. 291). Leong, Battistella, and Austin (2012) presented an example of a near-peer teaching model with four pharmacy students – a post-baccalaureate Doctor of Pharmacy student, a pharmacy resident, a third-year pharmacy co-op student, and a fourth-year pharmacy SPEP student – involved in a hemodialysis unit of a teaching hospital. After graduation, pharmacists are expected to be engaged in life-long learning and continuous professional development. Austin et al. (2005) reported that peer-support and peer-referencing were fundamental for pharmacists’ continuous professional development through which they could “make conscious decisions around the need for learning and its value to their development and practice” (p. 31).

In summary, the above studies inspired me to suggest that further research should look at peer-to-peer interactions among pharmacy students during their co-op work terms. Since peer or near-peer teaching and learning model seem to be a new frontier in pharmacy experiential learning, it would be worthwhile to investigate this unique model within the realm of co-op experiential learning in Canadian undergraduate pharmacy education as well.
5.6 Summary

After consulting with pharmacy students, co-op employers, and faculty members, I found that the impact of co-op experiential learning on the professional and personal development of undergraduate pharmacy students could be multi-dimensional. While students believed that they gained self-confidence and achieved self-discovery and career-related discovery after their co-op placements, their professional and personal development could primarily be driven by their own motivation and personality, according to the co-op employers. On the other hand, faculty members regarded that the employers or preceptors and the co-op sites did play a role in influencing students’ individual development.

Despite the unstructured and inconsistent nature of co-op where students might not be able to fully achieve the required educational competencies for entry-to-practice, it was evident that co-op did offer students the opportunity to explore the diversity of the pharmacy profession. Students should take ownership of their learning and faculty should supplement with teaching moments at school to reinforce and re-align the knowledge and skills acquired in classroom and those in real-world practice.

Through my research, I was able to propose a model of co-op experience integrated in the four stages of Kolb’s experiential learning cycle (Figure 7). I believe that a hybrid of both structured and unstructured experiential learning for pharmacy students might be an ideal curricular model.

To conclude, I have suggested future research to study co-op experiences of pharmacy students longitudinally or experimentally, provided that extraneous factors are carefully considered. Alternatively, more innovating and interesting approaches could include the adoption of the Pharmacists’ Inventory of Learning Styles (PILS; Austin, 2004) to pharmacy students,
followed by a study of the association between student learning styles and their co-op experiences or even their career paths; and the application of the peer or near-peer teaching and learning model in co-op experiential learning in Canadian undergraduate pharmacy education.
References

About the School of Pharmacy. (n.d.). Retrieved September 30, 2015, from https://uwaterloo.ca/pharmacy/about-school-pharmacy


Association of Faculties of Pharmacy in Canada Educational Outcomes for First Professional Degree Programs in Pharmacy (Entry-to-Practice Pharmacy Programs) in Canada. (2010). Association of Faculties of Pharmacy in Canada (AFPC).


Appendices

Appendix A. Administrative Consent from the School of Pharmacy, University of Waterloo

October 20, 2015

To Whom it May Concern:

This letter is to confirm that Certina Ho has the permission of the University of Waterloo School of Pharmacy to use information collected from students in the pharmacy program as part of her PhD dissertation. Appropriate consent and ethics approval was obtained at the time that the data was collected.

If you have any further questions, please feel free to contact me.

Sincerely,

David J. Edwards, PharmD, MPH, FCCP
Hallman Director and Professor
Appendix B. Information Letter and Consent Form to Student Participants

On Research Project Entitled
Experiential Learning in Undergraduate Pharmacy Curriculum at the University of Waterloo: A Case Study of Co-operative Experience of Pharmacy Students

May 5, 2011

Dear Student from the Class of 2011,

You are invited to participate in a research study conducted by Certina Ho, Adjunct Assistant Professor, School of Pharmacy of the University of Waterloo, Canada. The objective of the research study is to find out if and how skills are being developed, in particular, the personal or psychological development, during pharmacy students’ experiences of co-op work terms or experiential learning. This study is part of the requirement for Certina to complete her Ph.D. dissertation at the Ontario Institute for Studies in Education of the University of Toronto (OISE/UT), Canada. This study is under the supervision of Dr. Zubin Austin, Associate Professor, Faculty of Pharmacy, University of Toronto.

If you decide to volunteer, you will be asked to complete a 30-minute semi-structured interview, which will be audio-taped, with a research assistant from the Class of 2013, who has signed a confidentiality statement. Interviews are individual and that audio-recording will be done with your agreement. Interview will include questions on (1) your experiences of the co-op component of the undergraduate pharmacy curriculum; (2) learning outcomes of co-operative education; and (3) your perspectives of co-op in preparation for your entry-to-practice to the pharmacy profession in Canada. Participation in this study is voluntary. You may decline to answer any questions that you do not wish to answer and you can withdraw your participation at
any time by emailing Research Assistant at [insert email address of Research Assistant]. There are no known or anticipated risks from participating in this study. In addition, there will be no penalties by not agreeing to participate in this study or for withdrawing from the study. In addition, consent forms and transcripts of the interviews will not be provided to Certina until after grades have been submitted.

Since Certina may have interactions with many of you during this term, it is important to have procedures for creating an arm’s length in recruitment and data collection of this study. A third-party (i.e. a research assistant who has signed a confidentiality statement) will be involved in recruitment in order to provide some distance between Certina and the student/participant. Certina will not be aware of who has agreed to participate. The research assistant will collect and receive student consent forms on behalf of Certina.

In appreciation of your participation, you will receive a $10 gift certificate (e.g. Chapters/Indigo bookstores) at the end of the semi-structured interview. If you choose to withdraw before completion of the above research-related activities, you will receive a $5 gift certificate in appreciation of your time commitment.

It is important for you to know that any information that you provide will be kept confidential. All information collected from participants in this study will be aggregated and no individual could be identified from these aggregated results. Data will be analyzed and reported in a manner that does not identify individuals. Participants’ names will not appear in any report, publication or external presentation resulting from this study. With the participants’ consent, anonymous quotations from the interviews will be included in any thesis or publication that comes of this research. Data will only be accessible by Certina and her research assistants who have signed a confidentiality statement.
Data, with no personal identifiers, collected from the semi-structured interviews will be securely stored in a locked office on the 5th Floor at the School of Pharmacy, University of Waterloo. As well, the data will be electronically archived on a password-protected computer database after completion of the study and maintained for five years and then erased.

Should you have any questions about the study, please contact Research Assistant at [insert email address of Research Assistant]. Further, if you would like to receive a copy of the results of this study, please contact Research Assistant directly. In addition, research findings will be shared with the Curriculum Committee of the School of Pharmacy of the University of Waterloo. Results will also be presented in journals or at conferences, such as the Centre for the Advancement of Co-operative Education at the University of Waterloo (WatCACE) (funding agency of this study) Research Seminar and Opportunities and New Directions Conference at the University of Waterloo.

I would like to assure you that this study has been reviewed and received ethics clearance through the Office of Research Ethics at the University of Waterloo. However, the final decision about participation is yours. If you have any comments or concerns resulting from your participation in this study, please feel free to contact Dr. Susan Sykes, Director, Office of Research Ethics, at 1-519-888-4567 ext. 36005 or by email at ssykes@uwaterloo.ca.

Thank you for considering participation in this study.

Please return or fax back completed consent form (on p.3) to the attention of Research Assistant (Fax: 519-888-7910) by May 27, 2011 (Friday). Thank you.

Sincerely,

Certina Ho
Consent Form (Student Participants)

I have read the information presented in the Information Letter about a research project entitled Experiential Learning in Undergraduate Pharmacy Curriculum at the University of Waterloo: A Case Study of Co-operative Experience of Pharmacy Students conducted by Certina Ho at the School of Pharmacy, University of Waterloo. This study is under the supervision of Dr. Zubin Austin, Associate Professor, Faculty of Pharmacy, University of Toronto. I have had the opportunity to ask any questions related to this study, to receive satisfactory answers to my questions, and any additional details I wanted. I am aware that I may withdraw from the research project without penalty at any time by advising Research Assistant of this decision.

This project has been reviewed by and received ethics clearance through the Office of Research Ethics at the University of Waterloo. I was informed that if I have any comments or concerns resulting from my participation in this project, I may contact Dr. Susan Sykes, Director, Office of Research Ethics, at 519-888-4567 ext. 36005 or ssyskes@uwaterloo.ca. In addition, I was informed that if I have any questions regarding this project, I may contact Research Assistant, School of Pharmacy, at [insert email address of Research Assistant].

With full knowledge of all foregoing, I agree, of my own free will, to participate in this study.

[ ] YES [ ] NO

I agree to have my interview audio recorded.

[ ] YES [ ] NO

I agree to the use of anonymous quotations in any thesis or publication that comes of this research.

[ ] YES [ ] NO
Participant Name (please print): ______________  Participant Signature:__________________

Witness Name (please print): ______________  Witness Signature:__________________

Date: __________________________

Please return or fax back completed consent form to the attention of Research Assistant (Fax: 519-888-7910) by May 27, 2011 (Friday). Thank you.
Appendix C. Information Letter and Consent Form to Co-op Employers

On Research Project Entitled

Experiential Learning in Undergraduate Pharmacy Curriculum at the University of Waterloo: A Case Study of Co-operative Experience of Pharmacy Students

July 29, 2011

Dear Co-op Employers,

You are invited to participate in a research study conducted by Certina Ho, Adjunct Assistant Professor, School of Pharmacy of the University of Waterloo, Canada, as you have hired a co-op student from the Pharmacy Class of 2011 from the School of Pharmacy of the University of Waterloo between 2008 and 2010. The objective of the research study is to find out if and how skills are being developed, in particular, the personal or psychological development, during pharmacy students’ experiences of co-op work terms or experiential learning. This study is part of the requirement for Certina to complete her Ph.D. dissertation at the Ontario Institute for Studies in Education of the University of Toronto (OISE/UT), Canada. This study is under the supervision of Dr. Zubin Austin, Associate Professor, Faculty of Pharmacy, University of Toronto.

If you decide to volunteer, you will be asked to complete a 20-minute semi-structured telephone interview, which will be audio-taped, with Certina or a research assistant from the Pharmacy Class of 2013, who has signed a confidentiality statement. Interviews are individual and that audio-recording will be done with your agreement. Interview will include questions on (1) your perspectives of students’ experiences during the co-op component of the undergraduate pharmacy curriculum; (2) learning outcomes of co-operative education; and (3) your perspectives of co-op in preparation for students’ entry-to-practice to the pharmacy profession in Canada.
Participation in this study is voluntary. You may decline to answer any questions that you do not wish to answer and you can withdraw your participation at any time by emailing the Research Assistant at [insert email address of Research Assistant]. There are no known or anticipated risks from participating in this study or for withdrawing from the study.

In appreciation of your participation, you will receive a $10 gift certificate (e.g. Chapters/Indigo bookstores) at the end of the semi-structured telephone interview. If you choose to withdraw before completion of the above research-related activities, you will receive a $5 gift certificate in appreciation of your time commitment.

It is important for you to know that any information that you provide will be kept confidential. All information collected from participants in this study will be aggregated and no individual could be identified from these aggregated results. Data will be analyzed and reported in a manner that does not identify individuals. Participants’ names will not appear in any report, publication or external presentation resulting from this study. With the participants’ consent, anonymous quotations from the interviews will be included in any thesis or publication that comes of this research. Data will only be accessible by Certina and her research assistants who have signed a confidentiality statement.

Data, with no personal identifiers, collected from the semi-structured telephone interviews will be securely stored in a locked office on the 5th Floor at the School of Pharmacy, University of Waterloo. As well, the data will be electronically archived on a password-protected computer database after completion of the study and maintained for five years and then erased.

Should you have any questions about the study, please contact Research Assistant at [insert email address of Research Assistant]. Further, if you would like to receive a copy of the results of this study, please contact Research Assistant directly. In addition, research findings will be shared with the Curriculum Committee of the School of Pharmacy of the University of
Waterloo. Results will also be presented in journals or at conferences, such as the Centre for the Advancement of Co-operative Education at the University of Waterloo (WatCACE) (funding agency of this study) Research Seminar and Opportunities and New Directions Conference at the University of Waterloo.

I would like to assure you that this study has been reviewed and received ethics clearance through the Office of Research Ethics at the University of Waterloo. However, the final decision about participation is yours. If you have any comments or concerns resulting from your participation in this study, please feel free to contact Dr. Susan Sykes, Director, Office of Research Ethics, at 1-519-888-4567 ext. 36005 or by email at ssykes@uwaterloo.ca.

Thank you for considering participation in this study.

Please return or fax back completed consent form (on a separate attachment) to the attention of Research Assistant (Fax: 519-883-7580) by Friday, August 12, 2011. Thank you.

Sincerely,

Certina Ho
Attention: Research Assistant

Fax: 519-883-7580

Consent Form (Co-op Employers)

I have read the information presented in the Information Letter about a research project entitled Experiential Learning in Undergraduate Pharmacy Curriculum at the University of Waterloo: A Case Study of Co-operative Experience of Pharmacy Students conducted by Certina Ho at the School of Pharmacy, University of Waterloo. This study is under the supervision of Dr. Zubin Austin, Associate Professor, Faculty of Pharmacy, University of Toronto. I have had the opportunity to ask any questions related to this study, to receive satisfactory answers to my questions, and any additional details I wanted. I am aware that I may withdraw from the research project without penalty at any time by advising Research Assistant of this decision.

This project has been reviewed by and received ethics clearance through the Office of Research Ethics at the University of Waterloo. I was informed that if I have any comments or concerns resulting from my participation in this project, I may contact Dr. Susan Sykes, Director, Office of Research Ethics, at 519-888-4567 ext. 36005 or ssykes@uwaterloo.ca. In addition, I was informed that if I have any questions regarding this project, I may contact Research Assistant, School of Pharmacy, at [insert email address of Research Assistant].

With full knowledge of all foregoing, I agree, of my own free will, to participate in this study.

[ ] YES [ ] NO

I agree to have my interview audio recorded.

[ ] YES [ ] NO

I agree to the use of anonymous quotations in any thesis or publication that comes of this research.
[ ] YES [ ] NO

Participant Name (please print): ______________  Participant Signature:__________________

Witness Name (please print): ______________  Witness Signature:____________________

Organization: _____________________________  Department:

Phone: ______________  Fax: ______________  Email:_______________________

Date: ____________________________

Please return or fax back completed consent form to the attention of Research Assistant (Fax: 519-883-7580) by Friday, August 12, 2011. Thank you.
Appendix D. Information Letter and Consent Form to Faculty Members

On Research Project Entitled

Experiential Learning in Undergraduate Pharmacy Curriculum at the University of Waterloo: A Case Study of Co-operative Experience of Pharmacy Students

May 12, 2011

Dear Faculty,

You are invited to participate in a research study conducted by Certina Ho, Adjunct Assistant Professor, School of Pharmacy of the University of Waterloo, Canada, as you have taught students from the Class of 2011 between 2008 and 2010. The objective of the research study is to find out if and how skills are being developed, in particular, the personal or psychological development, during pharmacy students’ experiences of co-op work terms or experiential learning. This study is part of the requirement for Certina to complete her Ph.D. dissertation at the Ontario Institute for Studies in Education of the University of Toronto (OISE/UT), Canada. This study is under the supervision of Dr. Zubin Austin, Associate Professor, Faculty of Pharmacy, University of Toronto.

If you decide to volunteer, you will be asked to participate in a 45-minute focus group, which will include discussion topics on (1) your perspectives of students’ experiences during the co-op component of the undergraduate pharmacy curriculum; (2) learning outcomes of co-operative education; and (3) your perspectives of co-op in preparation for students’ entry-to-practice to the pharmacy profession in Canada. The focus group, which will be audio-taped with your agreement, will be facilitated by Certina or a research assistant from the Pharmacy Class of 2013, who has signed a confidentiality statement. Participation in this study is voluntary. You may decline to participate in any part of the focus group discussion that you do not wish to
engage and you can withdraw your participation at any time by emailing the research assistant at [insert email address of Research Assistant]. There are no known or anticipated risks from participating in this study or for withdrawing from the study.

Given the group format of this session I will ask you to keep in confidence information that identifies or could potentially identify a participant and/or his/her comments. If you have any questions about participation in this session, please feel free to discuss these with the facilitator, or later, by contacting Research Assistant at [insert email address of Research Assistant]. If you are interested in receiving a copy of the executive summary of the session outcomes, please contact Research Assistant at [insert email address of Research Assistant].

In appreciation of your participation, you will receive a $10 gift certificate (e.g. Chapters/Indigo bookstores) at the end of the focus group. If you choose to withdraw before completion of the above research-related activities, you will receive a $5 gift certificate in appreciation of your time commitment.

It is important for you to know that any information that you provide will be kept confidential. All information collected from participants in this study will be aggregated and no individual could be identified from these aggregated results. Data will be analyzed and reported in a manner that does not identify individuals. Participants’ names will not appear in any report, publication or external presentation resulting from this study. With the participants’ consent, anonymous quotations from the focus group will be included in any thesis or publication that comes of this research. Data will only be accessible by Certina and her research assistants who have signed a confidentiality statement.

Data, with no personal identifiers, collected from the semi-structured telephone interviews will be securely stored in a locked office on the 5th Floor at the School of Pharmacy,
University of Waterloo. As well, the data will be electronically archived on a password-protected computer database after completion of the study and maintained for five years and then erased.

Should you have any questions about the study, please contact Research Assistant at [insert email address of Research Assistant]. Further, if you would like to receive a copy of the results of this study, please contact Research Assistant directly. In addition, research findings will be shared with the Curriculum Committee of the School of Pharmacy of the University of Waterloo. Results will also be presented in journals or at conferences, such as the Centre for the Advancement of Co-operative Education at the University of Waterloo (WatCACE) (funding agency of this study) Research Seminar and Opportunities and New Directions Conference at the University of Waterloo.

I would like to assure you that this study has been reviewed and received ethics clearance through the Office of Research Ethics at the University of Waterloo. However, the final decision about participation is yours. If you have any comments or concerns resulting from your participation in this study, please feel free to contact Dr. Susan Sykes, Director, Office of Research Ethics, at 1-519-888-4567 ext. 36005 or by email at ssykes@uwaterloo.ca.

Thank you for considering participation in this study.

Please return or fax back completed consent form (on p.3) to the attention of Research Assistant (Fax: 519-888-7910 or his mailbox in the 3rd floor photocopier/mail room) by May 20, 2011 (Friday). Thank you.

Sincerely,

Certina Ho
Attention: Research Assistant

Fax: 519-888-7910

Consent Form (Faculty)

I have read the information presented in the Information Letter about a research project entitled Experiential Learning in Undergraduate Pharmacy Curriculum at the University of Waterloo: A Case Study of Co-operative Experience of Pharmacy Students conducted by Certina Ho at the School of Pharmacy, University of Waterloo. This study is under the supervision of Dr. Zubin Austin, Associate Professor, Faculty of Pharmacy, University of Toronto. I have had the opportunity to ask any questions related to this study, to receive satisfactory answers to my questions, and any additional details I wanted. I am aware that I may withdraw from the research project without penalty at any time by advising Research Assistant of this decision.

This project has been reviewed by and received ethics clearance through the Office of Research Ethics at the University of Waterloo. I was informed that if I have any comments or concerns resulting from my participation in this project, I may contact Dr. Susan Sykes, Director, Office of Research Ethics, at 519-888-4567 ext. 36005 or ssykes@uwaterloo.ca. In addition, I was informed that if I have any questions regarding this project, I may contact Research Assistant, School of Pharmacy, at [insert email address of Research Assistant].

With full knowledge of all foregoing, I agree, of my own free will, to participate in this study.

[   ] YES [   ] NO

I agree to have my participation in the focus audio recorded.

[   ] YES [   ] NO
I agree to the use of anonymous quotations in any thesis or publication that comes of this research.

[ ] YES [ ] NO

Participant Name (please print): _______________ Participant
Signature:__________________________

Witness Name (please print): _______________ Witness Signature:__________________________

Date: ____________________________

Please return or fax back completed consent form to the attention of Research Assistant (Fax: 519-888-7910 or his mailbox in the 3rd floor photocopier/mail room) by May 20, 2011 (Friday). Thank you.
Appendix E. Interview Guide for Semi-structured Interviews (30 minutes)

Participants/Interviewees: Students from the Class of 2011

Interviewer: Research Assistant (who has signed a confidentiality statement)

On Research Project Entitled

Experiential Learning in Undergraduate Pharmacy Curriculum at the University of Waterloo: A Case Study of Co-operative Experience of Pharmacy Students

Duration: 30 minutes

Interview topics on:

(1) Lived experiences of the co-op component

- What did you learn from your previous co-op work terms? Ask about the four domains of National Association of Pharmacy Regulatory Authorities (NAPRA) Model Standards of Practice:
  - Expertise in medications and medication-use
  - Collaboration
  - Safety and Quality
  - Professionalism and Ethics

- What did you learn about yourself (i.e. personal or intellectual growth) through your co-op experience?

(2) Learning outcomes of co-operative education

- What learning outcomes or competencies did you acquire from your co-op experience? Ask about the four constructs in Professional Learning Outcome Tracker (PLOT):
  - Patient care
(3) Co-op preparation for entry-to-practice to the pharmacy profession in Canada.

- How did you find your experiential learning in co-op work terms in preparing you to practice as a pharmacist in Canada? Ask about:
  - Knowledge
  - Skills
  - Attitudes

(4) Demographic information

- Gender of student
- Age
- Years of study
- Description of work setting in work terms 1 to 4
- Are you the only student at each of your work placements? Please elaborate.
Appendix F. Interview Guide for Semi-Structured Telephone Interviews

(20 minutes)

Participants/Interviewees: Co-op Employers

Interviewer: Certina Ho or Research Assistant (who has signed a confidentiality statement)

On Research Project Entitled

Experiential Learning in Undergraduate Pharmacy Curriculum at the University of Waterloo: A Case Study of Co-operative Experience of Pharmacy Students

Duration: 20 minutes

Interview topics on:

(1) Students’ lived experiences of the co-op component

- Please describe your perspectives of students’ lived experiences during the co-op component. What are the skills that your co-op student(s) has/have developed at your work setting? Ask about the four domains of National Association of Pharmacy Regulatory Authorities (NAPRA) Model Standards of Practice:
  - Expertise in medications and medication-use
  - Collaboration
  - Safety and Quality
  - Professionalism and Ethics

- Did you see any personal development (i.e. personal or intellectual growth) in your co-op student throughout his/her co-op work term with you? Please give some examples.

(2) Learning outcomes of co-operative education
• What learning outcomes or competencies did you see that your co-op student(s) has/have acquired from your workplace? Ask about the four constructs in Professional Learning Outcome Tracker (PLOT):
  o Patient care
  o Drug Distribution
  o Drug Information, Education, and Health Promotion
  o Pharmacy Practice – Management and Leadership

(3) Co-op preparation for entry-to-practice to the pharmacy profession in Canada.

• How did you find co-op in preparing pharmacy students to practice as a pharmacist in Canada? Ask about:
  o Knowledge
  o Skills
  o Attitudes

(4) Demographic information

• Gender of co-op employer
• Age
• Years of practice
• Description of his/her work setting
• Does he/she offer placement to more than one student at a time? Please elaborate.
Appendix G. Discussion Guide for Focus Group (45 minutes)

Participants: Faculty

Facilitator: Certina Ho or Research Assistant (who has signed a confidentiality statement)

On Research Project Entitled

Experiential Learning in Undergraduate Pharmacy Curriculum at the University of Waterloo: A Case Study of Co-operative Experience of Pharmacy Students

Duration: 45 minutes

Discussion topics on:

(1) Students’ lived experiences of the co-op component

• Tell me your perspectives of students’ lived experiences during the co-op component.
  What do you think about students in developing the following skills during their co-op work terms? Ask about the four domains of National Association of Pharmacy Regulatory Authorities (NAPRA) Model Standards of Practice:
  o Expertise in medications and medication-use
  o Collaboration
  o Safety and Quality
  o Professionalism and Ethics

• Did you see any personal development (i.e. personal or intellectual growth) in students throughout their experiential learning? Please give some examples.

(2) Learning outcomes of co-operative education

• What learning outcomes or competencies did you see that student(s) has/have acquired from their co-op experience? Ask about the four constructs in Professional Learning Outcome Tracker (PLOT):
- Patient care
- Drug Distribution
- Drug Information, Education, and Health Promotion
- Pharmacy Practice – Management and Leadership

(3) Co-op preparation for entry-to-practice to the pharmacy profession in Canada.

- How did you find co-op in preparing pharmacy students to practice as a pharmacist in Canada? Ask about:
  - Knowledge
  - Skills
  - Attitudes

(4) Demographic information of focus group composition

- Gender distribution of faculty members
- Years of teaching
- Subjects that they are responsible to teach at school
- Are they full-time or part-time faculty?
- Does he/she offer placement to students at the school during co-op?
- Does he/she offer placement to more than one student at a time? Please elaborate.
Appendix H. Research Assistant / Transcriber Confidentiality Agreement

On Research Project Entitled

Experiential Learning in Undergraduate Pharmacy Curriculum at the University of Waterloo: A Case Study of Co-operative Experience of Pharmacy Students

This study is being undertaken by Certina Ho, Adjunct Assistant Professor, School of Pharmacy of the University of Waterloo, to complete her Ph.D. dissertation at the Ontario Institute for Studies in Education of the University of Toronto (OISE/UT), Canada. The objective of the above research study is to find out if and how skills are being developed, in particular, the personal or psychological development, during pharmacy students’ lived experiences of co-op work terms or experiential learning. Findings of this research may be presented to the University community, and the results may be written up for publication or conference presentations.

**Project Title:** Experiential Learning in Undergraduate Pharmacy Curriculum at the University of Waterloo: A Case Study of Co-operative Experience of Pharmacy Students

I, ________________________________, the Research Assistant / Transcriber, agree to:

1. Keep all the research information shared with me confidential by not discussing or sharing the research information in any form or format (e.g., disks, tapes, transcripts) with anyone other than the Principal Investigator (PI) (i.e. Certina Ho).

2. Keep all research information in any form or format (e.g., disks, tapes, transcripts) secure while it is in my possession.
3. Return all research information in any form or format (e.g., disks, tapes, transcripts) to the PI (i.e. Certina Ho) when I have completed the research tasks.

4. After consulting with the Principal Investigator (i.e. Certina Ho), erase or destroy all research information in any form or format regarding this research project that is not returnable to the PI (e.g., information stored on computer hard drive).

**Research Assistant / Transcriber**

________________________  ______________________  __________
(Print name)  (Signature)  (Date)

**Principal Investigator**

________________________  ______________________  __________
(Print name)  (Signature)  (Date)

If you have any questions or concerns about this study please contact Certina at 519-888-4567 ext. 21328 or c30ho@uwaterloo.ca. This project has been reviewed by, and received ethics clearance through, the Office of Research Ethics. In the event you have any comments or concerns resulting from your participation in this study, please contact Dr. Susan Sykes at 519-888-4567, Ext. 36005 or by email at ssykes@uwaterloo.ca.