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Exploring Professional Identity Development in Medical Laboratory Professional Students

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Exploring Professional Identity Development in Medical Laboratory Professional Students

by

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A THESIS

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Abstract

Despite being the fourth largest health profession in Canada, medical laboratory science is perhaps one of the most poorly studied and underrepresented health care fields. While substantial research exists surrounding more well-known health care professions like nursing and medicine, there has been a minimal exploration of the sociological, cultural, and educational aspects of the medical laboratory profession in Canada. Given educational programs and clinical experiences are central to professional socialization processes and professional identity formation in health care professions, this research explores this process in a cohort of medical laboratory science students in the province of Newfoundland and Labrador, Canada.

Drawing from a conceptualization of professional identity development as a form of learning shaped through cognitive, emotional, and social dimensions of lived experience, I explored the individual and professional experiences of students in a contemporary medical laboratory training program. Utilizing a case study approach, the study focused on the experiences that occurred during students' first substantive encounter with a clinical laboratory environment and evaluated how the clinical practicum served to affect their professional identity development, perspectives of the field, and view of the medical laboratory profession in a transformative way. Consistent with research in other health-related fields, findings indicated that clinical practicum serves as a particularly important transitional and transformational period for student medical laboratory professionals and is a time in which they reflect upon their attitudes, behaviours, roles, and experiences. This research concluded that exposure to the clinical realm serves to affect their sense of professional identity in meaningful ways.

Preface

This thesis is original, unpublished, independent work by the author, G.S. Hardy. The interviews reported in Chapters Four and Five were covered by Ethics ID REB17 – 2007_REN1, issued by the University of Calgary Conjoint Faculties Research Ethics Board for the project “Exploring Professional Identity Development in Medical Laboratory Professional Students of Newfoundland and Labrador” on December 18th, 2017.

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Secondly, I must acknowledge my committee members Dr. Kaela Jubas and Dr. Janet Rankin. They were my twin pillars of support and expertise. Kaela pushed me to uproot my pre-existing ideas and challenged me to look past my prejudices even on the occasions when I stubbornly objected. All the while, Janet's expertise, detailed feedback, and kind nature kept me grounded in health care and reminded me on many occasions why I chose to mix my two fields of interest. I could not have asked for a better committee.

I must also acknowledge my family and, in particular, my uncle, who taught me a long time ago, the benefits and rewards of hard work, and what it means to embrace continuous learning.

Finally, I must acknowledge my partner Crystal, who, through the countless hours of editing at my desk, cursing, and self-induced headaches that came with this work, was always there with kind support, coffee, and a suggestion to walk away and enjoy the day. Without you, I would still be working at my desk.

Dedication

This dissertation is dedicated to my students and to all medical laboratory students who enter our profession and support each other. As any educator knows, students are what drive us, and support from our peers is what steers us in the right direction.

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List of Acronyms and Definitions

- CNA:** College of the North Atlantic: One of two public post-secondary institutions in the province of Newfoundland and Labrador. CNA offers both MLT and MLA training. Research participants were enrolled in the 3-year MLT training program.
- CSMLS:** Canadian Society for Medical Laboratory Science: The national society of laboratory professionals within Canada. All provinces apart from Quebec require CSMLS certification to practice medical laboratory science.
- MLP:** Medical Laboratory Professional: An overarching term for several groups of individuals trained in the area of medical laboratory science, including but not limited to medical laboratory technologists, medical laboratory technicians, medical laboratory assistants, genetics technologists, cytotechnologists, and pathology assistants.
- MLT:** Medical Laboratory Technologist: A classification for laboratory workers in Canada. MLTs function as the primary working unit in clinical laboratory settings focusing on diagnostic analysis. They function in predominantly analytical roles within health care environments and are a regulated professional group in most Canadian provinces.
- MLA:** Medical Laboratory Assistant: A practitioner within the field of medical laboratory sciences with a specific focus on the pre-analytical phases of testing. MLA training is significantly shorter in duration and scope than the MLT, and presently, MLA is not a regulated group in any Canadian Province.
- NLCHP:** Newfoundland and Labrador Council of Health Professionals: Serves as the regulatory authority for allied health professionals in the province of

Newfoundland and Labrador. All practicing MLTs in NL must be members registered with the NLCHP to practice.

CHAPTER ONE: INTRODUCTION

Overview

Sometime around 300 BC, Hippocrates advocated a medical protocol that included listening to the lungs, observing skin color, and the tasting of urine (Berger, 1999). It was recognized at the time that urine with a sweet taste was abnormal, though it was not understood that the reason for this is simply that beyond the renal threshold, blood glucose begins to filter through the kidneys into the urine which is a telltale sign of diabetes mellitus. This knowledge was perhaps the first *taste* the world had encountered of the diagnostic test. As medicine evolved, advances in diagnostic testing occurred, including experimentation with blood transfusion, the early coagulation testing of plasma, the discovery of bacteria and microscopy, and a myriad of diagnostic tools that allowed the field to evolve. By the mid-1800s, lab tests had been introduced to detect tuberculosis, cholera, and diphtheria, and in 1898, Sir William Osler, a Canadian physician and an early pioneer in the clinical laboratory, established ward laboratories in a hospital setting (Berger, 1999).

Meanwhile, hospital laboratories had begun to open in the United Kingdom and the United States. Gripping the world of medicine and physicians was an exponential expansion of diagnostic tests (Berger, 1999; Kotlarz, 1998). It was here that the medical laboratory profession began to diverge from its foundation and become a separate entity. As fascinating as they are, this research is not about the changes in diagnostics that occurred throughout the centuries. Instead, it is about the changes in the identity of those who are learning to perform these tasks, what it means to them, and how they make sense of themselves and those around them.

In this chapter, I first address my academic background and clinical experiences in the field of laboratory medicine that greatly impacted my interest in this study. I then discuss the

context of the study with a focus on the medical laboratory profession and give a brief historical perspective of the profession today. I follow this with the research rationale, research questions, and theoretical framework used to frame the study in terms of identity development.

Background of the Researcher

My first few years of university were underwhelming in many respects. The classes were enormous, with hundreds of students in vast lecture halls with a professor talking “at” us with virtually no engagement. The laboratory work was rudimentary and woefully unengaging, and even today, I recall the sheer boredom that I experienced as an undergraduate in the biology lab of the science building of my alma mater. Later in my academic career, I was offered a placement in a medical laboratory science program at the local college. While I entered the program with an expectation of a similar approach to teaching and learning I had seen in university, the two years that followed were some of the most engaging moments of my education, and included an introduction to competency-based learning, clinical simulation, and experiential education. What I learned in these years perhaps most profoundly as it relates to my life as an educator, is that effective teaching in the laboratory requires an acknowledgment that learners have a great deal to contribute to the classroom.

Following the completion of my education in medical laboratory science, I worked in several of the major hospitals in Newfoundland and Labrador as a medical laboratory technologist. During this time, in addition to my clinical duties, I was actively involved in the education of new students rotating through their clinical practicum, and this was my first foray into education from the perspective of the teacher. While I had no formal studies in the discipline of education, I felt that the students could benefit most by completing tasks in the same manner as an active practitioner, and that experiential learning was of the highest value in their learning.

In 2009, I accepted a position to teach in a new medical laboratory assistant program and subsequently began working towards my undergraduate degree in education. At this point, my teaching practice was primarily informed by my identity as a health care professional, and much of my teaching revolved around a responsibility to uphold the standards of the profession. I focused heavily on a top-down approach to teaching wherein I was the expert practitioner feeding knowledge to my students, but I quickly learned the limitations of this approach. Near the end of my first degree in education, being removed from the clinical setting, and having been exposed to a wide array of student perspectives, I had started to muse on the implications of how students were effectively engaged, and how to approach teaching and learning within the profession, outside of my practitioner-oriented frame of reference. Adding to this shift, in 2013, I completed a master's degree in education, and I had begun to modify my teaching practice further, to favour more collaborative approaches in the classroom.

Following the completion of my degree, I found myself sifting through the data from my master's research and asking questions about some less obvious implications. In particular, I considered how my students, and indeed myself, made sense of their chosen profession, and how the medical laboratory field impacts the core of who they are and what they become. I reflected on what it even meant to *be* a medical laboratory professional, its role in the health care setting, and the deeper meanings beyond the frontline of practice. These and other questions allowed me to construct questions on something that I had often described to myself and my colleagues as a “difference in my students from the time before and after their clinical practice” and how “they changed after the practicum.” I concluded that further exploration of the fundamental aspects of the social constructs of the laboratory profession was necessary.

Unfortunately, while I had developed a curiosity around what I considered a changed in my students, at the time, I had not thoroughly engaged in any level of study relating to adult education theory. Indeed, my earlier education had been mainly rooted within the life sciences and the post-secondary education studies. I held only rudimentary understandings of even the most well-known adult learning theorists. Through the completion of the coursework within this doctoral program, I was introduced to the works of various adult education scholars and theorists, including most notably Jack Mezirow, Peter Jarvis, James Gee, and John Dirkx. Their perspectives not only allowed me to reflect on and develop my approach to teaching and learning—particularly as they relate to experiential education and the notions of disjuncture and disorienting dilemmas, and how these ideas could be applied to medical laboratory technology students—but also to consider more deeply the required scholarship in the field. Jarvis' (2008) perspective on the notion of transformative learning through experience was of particular value as well as Gee's (2001) concept of multiple forms of identity, which aided my conceptualization of identity.

Later through my EdD program, I was introduced to the work of Knud Illeris. It was his theoretical perspectives regarding learning and identity that allowed me to focus on, conceptualize, and develop a practical approach to explore how students in various programs undergo shifts in their sense of self as a result of their engagement with the social environment. Moreover, throughout this program, I came to understand the perspective of social constructivism which understands learning as a social process which takes place between people, and is therefore social in nature as individuals create meaning through their interaction with each other and their environments (Kim, 2010).

Thus, throughout this research, I situated myself at the intersection between medical laboratory practitioner, medical laboratory educator, and education researcher. These three perspectives, along with the newly considered underpinnings of social constructivism, have not only allowed me to reflect on my teaching practice but have allowed me to reflect on and explore the difference that I had observed in my students during the transition from student to novice practitioner.

This reflection resulted in my embarking on this study with the desire to contribute to the limited body of research within the medical laboratory profession and provide insight into the complex nature of how practitioners develop within their profession.

Research Context

The medical laboratory profession is in a state of change and growth, but limited literature on the non-technical aspects of the profession, including professional identity and the professional socialization processes, indicate a substantial knowledge gap. This knowledge gap is especially significant, given the rapid changes in policy and curricular framework currently underway (Grant, 2004b). Examples of these changes include; the adoption of a new medical laboratory technologist (MLT) competency profile for 2019; a shift in national certification examination structure for 2019; adoption of an updated code of ethical conduct in 2017; a widespread increase in mandatory continuous learning models; an increase and modification of external laboratory and laboratory education accreditation processes; and a rapid increase in national levels of regulation since 2012 (Accreditation Canada, 2019; Canadian Society for Medical Laboratory Science, 2019; Grant, 2004b; Hardy, 2013). Despite limited research, curricular, legislative, and regulatory changes regarding the medical laboratory profession and the education of its practitioners continue to occur and the field is currently expecting significant

labour shortages placing upward pressure on educational institutions to increase enrolment (CSMLS, 2019). While these trends and ongoing changes within the field have the potential to affect many Canadians, it remains understood almost exclusively by those directly involved with the profession.

In addition to these changes, there has been a broader trend in health care in recent years to *prescribe* the professional values, attributes, organizations, and behaviours particular to a field, and the prescription of these are expected to increase professionalism among members (Anijar, 2004; Chiovitti, 2015; Evetts, 2014; Grant, 2007; Karseth & Nerland, 2007; Latshaw & Honeycutt, 2010). Yet, there has been no empirical exploration of how these prescriptions are taken up within the medical laboratory profession nor the impact these prescriptive constructs have on shaping the identity of medical laboratory professional (MLP) students or practitioners. The most recent Canadian Society for Medical Laboratory Science (CSMLS) competency profile, for example, contains a growing section titled “professional practice” in which students must demonstrate competence related to professional responsibility, the scope of practice, and professional development (CSMLS, 2005, 2015). This section has increased in breadth despite limited research on how these shifting competencies are taken up by MLP students nor their impact on their sense of self or their perceptions of the profession.

Moreover, there has been no evaluation or exploration of the learning that occurs relating to MLPs identity development in Canada. Thus, there is a definite need for more research to help the MLP field to make informed decisions about their policies and training programs for their practitioners at entry and later stages of their career. This study contributes to this with a specific focus on MLP students’ professional identity development.

Statement of Problem

While there has been considerable exploration and discussion around professional identity in fields including nursing, teaching, and medicine, there is highly limited research exploring this concept within the medical laboratory profession and virtually zero on the impact of contemporary MLP education programs on professional identity and view of the profession within the medical laboratory science field. There have been only a select few substantial studies related to influences on professional identity and the more deeply embedded ideas of professionalization and professional socialization within the realm of medical laboratory science in North America (Butina, 2010; Butina & Schill, 2011; Grant, 2004b; Schill, 2012, 2017). Moreover, unlike fields including nursing, teaching, and medicine, there has been minimal substantive research to demonstrate how medical laboratory students begin to develop their professional identity and transition from student to health professional, despite more generalized research which indicates that professional identity development is fundamental in health professional student success (Mylrea, Sen Gupta, & Glass, 2017).

Thus, a study regarding the learning aspects of the profession is of great importance and may serve to inform those who are in the process of forming policies and prescriptions surrounding the medical laboratory profession at all stages. As well as providing a deeper understanding of the process of professional identity development among health care professionals, this research serves to address a substantial gap in the medical laboratory sciences literature. It has the potential to inform educational policy development related to professional identity, formal MLP training programs, professional development, and social awareness of the medical laboratory field during a time of rapid professional reorganization through the lens of entry-level MLPs.

While the experiences of students at all stages of many professional education programs are likely to affect their developing professional identity, this study is bound to the clinical practicum, within a program of study, as a specific point common to Canadian MLP training programs. Through my professional experience, I have observed that most students who enter the College of the North Atlantic's (CNA) medical laboratory technology program have a limited formal background in the health professions, and the clinical practicum is considered an essential part of the educational program. The clinical practicum serves as a crucial point of the application of clinical skills and development of technical competencies as well as socialization within the field. It is here that the process of converting theory and didactic lessons into professional practice occurs, and it was following this practicum in which my experience with students suggested a shift in how they perceived the profession.

Purpose of Study

The purpose of this research was to explore the process of professional identity formation of MLP students as they continue their transition from learner to professional in a contemporary educational program. The clinical practicum experience is a required component of all students within the medical laboratory profession in Canada and routinely occurs toward the end of their prescribed curriculum. This research utilized a qualitative case study approach bound to a cohort of CNA MLP students in NL to explore this phenomenon. The specific research questions were:

1. What professional identity characteristics do MLP students develop during the completion of their clinical practicum experience? How do these characteristics differ from those which existed at the beginning of the practicum?
2. What experiences during the clinical practicum were related to transformative learning and the transformation of the students' professional identity?

3. How does the students' developing professional identity relate to the perspectives of the medical laboratory profession or field?

Theoretical Framework

How the clinical experiences of a cohort of MLP students inform their developing professional identity during their formal education was central to this inquiry. More specifically, the research focused on how they viewed the profession, their position within it, and their sense of professional self before and after their clinical practicum. Fundamentally, I consider this a learning process that requires a theoretical understanding of learning and a further conceptualization of how identity learning (as a form of adult learning) and development are taken up within the context of this research.

In this work, I adopted the theories of the Danish adult education scholar Knud Illeris (Illeris, 2003a, 2003b, 2004, 2014a, 2014b, 2014c, 2015) as they relate to learning, identity, and transformative learning. Illeris is well established in the field of adult education and has contributed significantly to general learning theory in the last two decades. Drawing from a background in cognitive psychology and building on the theoretical perspectives of Jean Piaget (learning styles), Daniel Stern (the self), Erik Erikson (identity and development), John Dewey (experiential learning), and Etienne Wenger (social learning), Illeris (2003a) proposes that all learning processes involve the interaction of three integrated dimensions known as the social, emotional, and cognitive dimension. In later works, Illeris (2011a, 2014a, 2014b) expands on his three-dimension model and incorporates aspects of identity, workplace, competence, and transformative learning, but throughout this work, I chose to focus on Illeris' (2003a) early conceptualizations as they provide the foundation for further studies and allowed for manageability of the work.

In addition to his contributions to general learning theory, Illeris (2014b) offers a general description of *identity* as a construct consisting of three primary layers (core, personality, and preference). Together, these layers comprise an individual's central personal identity—how one experiences one's self, and how one is experienced by others. It is important to note that Illeris' personality layer is most often concerned with how one relates to others.

According to Illeris (2014b), an individual's central personal identity also contains multiple offshoots or parts that have a similar structure but also contain within them a particular element or lens through which to interpret and shape experiences. These include, for example, national identity, professional/work identity, and religious identity. Illeris (2014c) combines his conceptualizations of learning and identity to propose that shifts in particular areas of the identity—particularly the personality layer—constitute transformative learning.

Thus, the following statements comprise the theoretical framework of the study derived from Illeris' work, which I elaborate on in Chapter 2.

1. All learning (including adult learning) occurs holistically through cognitive, emotional, and social dimensions.
2. An individual's identity is composed of many elements or parts, some of which are more stable than others, and each part is itself composed of many elements.
3. Transformative learning is marked by a change in the learner's identity.

Connecting the Theory to My Inquiry

As noted in the previous section, within this research, I utilized Illeris' (2003a, 2003b, 2004, 2011a, 2014a, 2014b, 2014c, 2017) theories of learning, identity, and transformative learning to provide a framework for the conceptualization of professional identity development as a transformative process situated within more general adult learning theory. The focus of this

research was on the developing professional identity—one interrelated part-identity amongst many—of a group of MLP students. Throughout the inquiry, I understood experiential learning opportunities as important sites of identity development (Ibarra, 1999; Illeris, 2003a, 2014b, 2014c; Owen & Stupans, 2009; Schein, 1978; Wenger, 1998). Accordingly, I narrowed the focus of the research on the lived experiences of the first substantive exposure of MLP students to professional practice. This approach allowed for a determination of how and what experiences functioned to modify the personality layer of the developing professional part-identity.

Thus, through the specific learning intervention and engagement with clinical practice, I considered the developing professional identity layers—particularly the personality layer—were subject to modification through engagement with said practice (Illeris, 2003a, 2014a, 2014b, 2014c, 2015). By exploring their developing professional identity at two points in time both before and post-practicum, this research allowed for a determination of if and how transformative learning occurred (as marked by a shift in their developing professional identity), and what factors contributed to such identity development.

Figure 1.1 provides a visual representation of this conceptualization. The large rectangle surrounding the figure represents the general adult learning landscape, where according to Illeris (2003a, 2003b), all learning involves interaction with the cognitive, emotional, and social dimensions of learning. The left column represents Illeris' (2014b, 2014c) layered concept of the central personal identity or any part-identity (transverse to the central personal identity) and, in this instance, focuses on select aspects of the developing professional identity including relational attitudes, meanings, convictions, and values. The right column focuses on the existing personality layer of the professional part-identity before the clinical practicum and demonstrates

the incorporation of the lived experiences of the clinical practice into the existing personality layer.

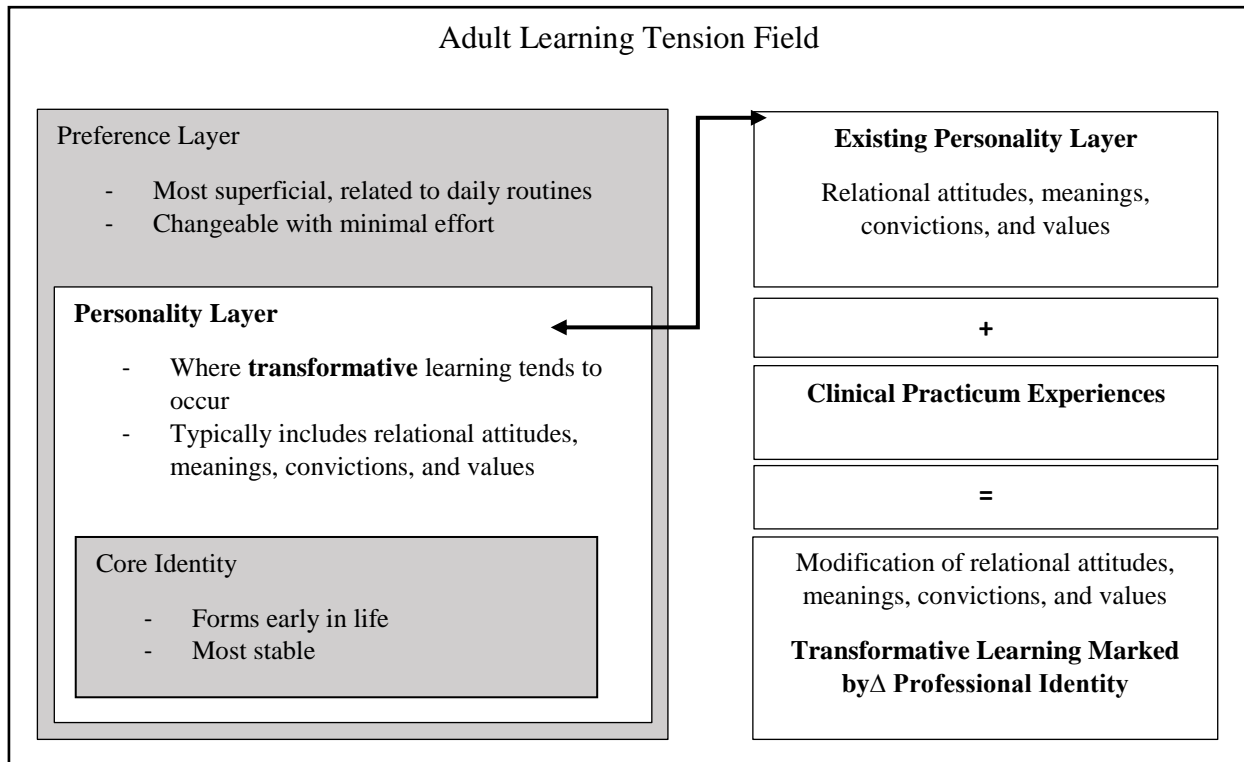


Figure 1.1. Conceptualization of MLP student professional identity development.

It is through the interaction and reflection with the lived experiences of occupations that individuals actively construct knowledge and meaning (Ibarra, 1999; Owen & Stupans, 2009; Schein, 1978; Wenger, 1998). This process ultimately functions to impact their professional identity, thereby providing an opportunity for multiple forms of learning, including transformative learning. Therefore, upon the addition of the lived experiences of the clinical practicum to the existing personality layer, the right column demonstrates a potential outcome equal to a modification of relational attitude, meanings, convictions, and values as a change in the professional identity—the mark of transformational learning.

Through this conceptualization, the research allowed for an analysis of the clinical practicum as a specific learning intervention, and how this intervention informed the developing

professional identity of the study participants. Furthermore, whether and how the internalized social norms, customs, practices, perspectives, attitudes, convictions, and shared values of the social group emerge at specific points for students was explored.

Implications of Research

As there has been limited knowledge creation related to professional identity formation within MLP students within Canada, the research is of interest to those charged with the education of MLP students as well as those interested more broadly in professional identity development. Most significantly, this research serves to address the limited body of research surrounding medical laboratory professionals as it relates to conceptualizing their identity and as a starting point for a broader discussion around the implication of professional identity formation within this relatively unexplored occupational group. Given ongoing trends within the laboratory profession and broader health care environments, which aim to increase levels of professionalism within the field, this research may inform the development of approaches to aid and better understand professional identity formation in the educational setting. The study also serves to bring to the forefront the voice of the MLP students who are influenced by regulatory and policy changes that continue to occur. It may also be of interest to those charged with informing regulations, licensure procedures, and the development of continuous educational programs.

Organization of Thesis

In this first chapter, I described the context, statement of the problem, and purpose of the study, and provided the theoretical framework taken up within this research to consider the development of MLP student identity. In Chapter Two, I review the literature surrounding the medical laboratory profession in Canada, professional identity literature, and the literature related to professionalism within a Canadian MLP context. In Chapter Three, I discuss the

methodology and research processes leading to the findings of the study. In Chapter Four, I present the findings of the study emerging from the data with a specific focus on both pre-practicum and post-practicum participants' professional identity. In Chapter Five, I discuss the results of the study for each research question that includes how the select aspects of the student MLP professional identity development occurred in relation to the theoretical framework described.

CHAPTER TWO: LITERATURE REVIEW

Overview

This chapter presents a review of the literature related to this study with a focus on the medical laboratory profession and identity. Since the literature on medical laboratory science in Canada and beyond is limited, with little attention to its practitioners, in this review I highlight other relevant aspects based on eight themes: the medical laboratory profession; medical laboratory education; professionalism discourse and professionalization of laboratory science; theoretical perspectives of Illeris' framework; theoretical perspectives of identity; perspectives of professional identity; studies on professional identity of students of MLP and comparable fields; and research on MLPs.

The Medical Laboratory Profession

Before 1900, most laboratory tests were performed exclusively by physicians or pathologists (Butina, Feltner, & Slone, 2018), but the expansion of testing performed was in sync with the technological revolutions of the 20th century and quickly outgrew their capacity. Exacerbating the demands for testing were major global conflicts that contributed in large part to epidemic outbreaks of community-acquired infections, including cholera, diphtheria, and tuberculosis (Butina, Feltner, & Slone, 2018). Thus, the medical laboratory profession arose out of a need, and as an offshoot of medicine in the early 20th century. At that time, the medical laboratory technician as it was often referred (and still is in many European countries), operated as an aide to the physician, completing procedures considered unworthy of their time. Grant (2004b) concluded that this was a feminized and oppressed occupational group for much of its history, as these first-generation laboratory technicians were often young, uneducated women, recruited to aid physicians in large urban hospitals. This trend was not unlike that which was

experienced in fields including nursing and therefore carries significant implications when considering the dynamics associated with the medical laboratory profession today. As time moved on, the demand for certified professionals grew due in part to increased public demand for health services, expansion of the realm of medicine, rising expectations of qualified personnel, and an increasing level of public accountability. The shortage of qualified laboratory personnel, along with increasingly complex testing requirements, eventually gave rise to specialization in several clinical laboratory disciplines (Kotlartz, 1998). Though variations exist between countries, these specializations routinely include clinical biochemistry, molecular biology, microbiology, immunohematology, pathology, cytology, and hematology.

Unfortunately, while other feminized fields like nursing have undergone significant professionalization in recent years (Forsyth, 1995; Watkins, 2011), gaining a great deal of autonomy and defining themselves as a separate entity of practice, until recently the medical laboratory profession has remained almost exclusively under the direction of the physician community. Today, the medical laboratory profession makes up one of the largest groups of health professionals, yet, due perhaps to its historical “sidekick” status, there is ambiguity in how to define an MLP or the work they perform. Central to this ambiguity is the level of education required, the scope of practice, ongoing structural oversight, and shifting regulations, which vary from country to country. Even within the profession itself, there is inconsistency as to how to categorize a MLP. Pathologists, technologists, physicians, technicians, assistants, specialists, scientists, can all be quantified as MLPs to some extent. Even the name of the professional work and field varies across the globe. The terms clinical laboratory science (United States), medical laboratory sciences (Canada), biomedical sciences (United Kingdom), medical sciences (Australia), and medical biology (France) function as catchall phrases for those operating within

the medical laboratory environment. As much of the literature is rooted within the North American context and given this study focused in a Canadian province, it is necessary to delineate these from within the broader field and create boundaries for which to examine the profession. Thus, as is the case for both Canada and the United States, the focus of this research is on those individuals who fall outside the scope of medical physicians (i.e., pathologists, MDs) or medical scientists (i.e., clinical biochemists, PhDs, medical microbiologists) and looks specifically at those who perform the majority of diagnostic testing.

Medical Laboratory Profession in North America

In North America, medical laboratory professionals (Canada) or clinical laboratory professionals (United States/Mexico) consists of a group of professionals whose work is directly related to the analysis of bodily fluids for use in diagnosis and treatment of disease. These individuals are often referred to as “allied” health professionals. While the exact definition of an allied health profession(al) is open to interpretation, commonly, it is understood as distinct from medicine and nursing (Richardson et al., 1989). Examples include dental hygiene, diagnostic medical sonography, dietetics, physical therapy, respiratory therapy, and medical laboratory technology (Association of Schools of Allied Health Professions, 2017). Notably, the terminology “allied” is not without meaning, as the words used to describe a group are often of significance. These professions are by some descriptions more of a group of “para-professions” in that they have not historically fallen under the category of a learned society like medicine or law. This is subjective, and beyond the scope of this research, but it does raise the internal question of “allied to what” as well as lingering questions around historical gender roles in the field. According to Grant (2004b), this implication or label is equivalent to a secondary status, the grouping of various health professionals in an unknown mass. Thus, this notion of the allied

health professions as being “allied to” or perhaps more liberally equated to “less than” is an important consideration when discussing the current and historic social positioning of the medical laboratory profession.

To elaborate on this point, the diagnostic test as only being interpretable and reportable by a physician despite being completed and validated by the MLP is a contentious issue within the medical laboratory field (Davis & Singh, 2011; Kotlartz, 1998; Young, Scheinberg, & Bursztain, 2014). Grant (2004b) perhaps best captured the significance of this as she stated in her assertion that “the medical laboratory practitioners’ identity is shielded from the patients who benefit from its services” (p. 1). This statement is a direct result of the fact that almost all work product (i.e., diagnostic results) produced by MLPs is rarely directly communicated to the patient by the MLP. Instead, it is interpreted by and shared with patients only by physicians and nurses. While this phenomenon is particularly prevalent within the United States and Canada, some countries have begun to deviate from this trend, as there have been ongoing conversations regarding the evolving role of MLPs relating to direct access of patient results and the ability of patients to order diagnostic tests without a physician’s request (VanSpronsen & Villatoro, 2016).

Medical Laboratory Profession in Canada

The work performed by MLPs within North America is generally consistent, and there is some exchange of labor, particularly between the United States and Canada, though each maintains distinct regulatory standards and scopes of practice. In each country, MLPs perform applied diagnostic tests on human specimens spanning numerous fields, including clinical biochemistry, molecular biology, microbiology, immunohematology, pathology, cytology, and hematology, to assist clinicians in the diagnosis and treatment of disease. Despite significant similarities, it is worth noting that there are also differences between the United States and

Canada as it relates to the actual work performed and the qualifications obtained. These differences are likely resultant of the different models of care utilized between the United States and Canada (public vs. private) as well as the increasingly complex United States governmental system (National vs. State).

Within Canada, there is a high level of uniformity related to ML practice. Most Canadian MLPs (including those within NL) operate within highly unionized or regulated environments with provincially legislated qualifications, publicly available job descriptions, and regulated wages. Apart from Quebec, MLPs in Canada have relatively standardized routes to certification which include, medical laboratory technologist (MLT), the largest group which functions as the primary workhorse of the field, medical laboratory assistant (MLA), genetics technologist, and cytotechnologist (CSMLS, 2019). Comparatively, in the United States, the American Society for Clinical Pathology alone offers more than 20 types of certification of varying levels and specialization (American Society for Clinical Pathology, 2019).

In addition to qualification similarities, the similarities in the scope of practice among Canadian provinces are remarkable as the majority of MLTs have obtained the same level of certification in five primary areas of specific knowledge, commonly referred to as disciplines or subjects. Notably, this is a relatively recent phenomenon as historically, MLTs could obtain certification in individual areas of practice (i.e., hematology, clinical chemistry, transfusion medicine) and became known as “subjects” or “subject techs” (Grant, 2011). This specialty certification at entry-level was eliminated in 1997 as the CSMLS had, in the early 1990s, begun to shift to a general competency profile that remains in place today. In addition to similarities in certification across Canada, there are structures to control for significant variations in practice, including public demand for equal care across provinces through the Canada Health Act

(Government of Canada, 2018), logistics and regulatory boundaries, and guidelines from external agencies. Canadian Blood Services, for example, serves as the single (outside of Quebec) provider of human blood products in Canada, and thus each laboratory must comply with the standards set through them.

In addition to a standardized level of practice, another significant phenomenon occurs in Canada. Much like nursing throughout much of the developed world, there is a considerably uneven ratio of females to males. As of 2015, 83.8% of the national workforce identified as female ranging from a low of 80.4% female in Ontario to 90.3% female in Saskatchewan (Canadian Institute for Health Information, 2015). This skewed ratio further occurs in other developed countries, including the United States and Sweden (Grant, 2003; Lindler & Chapman, 2003). Moreover, this gender imbalance historically incorporated a significant glass ceiling phenomenon, as well as wage disparity, wherein females were far less likely to be in a position of oversight or control (Bureau of Labor Statistics, 2018). In 1999, 70% of MLTs in NL were female (Keeping, 2000), while more recent data indicated this had risen to 83.0% (CIHI, 2015). Notably, most technologists in NL work in highly unionized clinical environments (Newfoundland and Labrador Association of Public Employees (NAPE), 2019), significantly mitigating any direct gender wage disparity of this group. At the practice level, all technologists receive equal pay (hourly wage) based solely on years of experience. Promotion remains primarily directed through seniority-based aspects above all else (NAPE, 2019). Fundamentally, the medical laboratory field is and will remain for the near future, primarily female-dominated, and continue to operate in a heavily unionized environment.

Regardless of the terminology used to define the group, MLPs make up one of the largest health professions in Canada with more than 20,000 practitioners (CIHI, 2015; CSMLS, 2019;

Grant, 2004b; Hardy, 2013; Keeping, 2000). In NL, alone, there are over 500 practicing MLTs (Newfoundland and Labrador Council of Health Professionals, 2019). Though the field once drew much of its work from manual and comparatively simple procedures, the realm of diagnostic testing has exponentially grown, and the imperative for laboratory medicine and the laboratory professional to patient care is unquestionable (Hallworth, 2011). Today, a laboratory professional is almost always involved in the care a patient receives in any Canadian hospital. Their contributions range from diagnosis of infection to assessing a patient's ability to receive operations, chemotherapy, or medications, to genetic sequencing. However, patients will routinely never actually see a MLP apart from the MLA who routinely collects their blood. Furthermore, the limited body of existing research surrounding the medical laboratory field is representative of their visibility (Gilligan, 2017; Hartley & Tansey, 2015). In Canada, MLPs remain one of the least known of any health care professional, rarely being cited or acknowledged in publications, or participating in research, and leaving little trace within the historical record (CIHI, 2015; Grant, 2004a, 2004b; Hartley & Tansey, 2015).

Medical Laboratory Education

While much of the technical work performed at the MLT level does not vary significantly between national bodies due to the well-established standards of practice which exist (i.e., there is usually one best method to measure a specific analyte), the qualifications of those people who perform the same procedures vary internationally. Most notably, the qualification obtained ranges from undergraduate degree preparation for various levels of certification in some countries (United States, United Kingdom, Australia) to non-degree entry to practice in others (Canada, France). In the United Kingdom and Australia, for example, the “Medical Laboratory Scientist” certification (baccalaureate degree level) is roughly equivalent to the “Medical

Laboratory Technologist” (diploma level) in Canada. Indeed, Canada is somewhat unique in the English-speaking world in its certification and education of MLPs.

Medical Laboratory Education in Canada

Most MLPs (MLTs, genetics technologists, and cytotechnologists) in Canada are provincially regulated, licensed, and have emerged from accredited training programs of substantial rigour. One of the primary criteria when considering the need to regulate a health profession in Canada is whether there is potential for harm in the delivery of health care. Harm constitutes actions wherein a substantial risk of physical or mental harm may result from the practice of the profession (Ontario Health Professions Regulatory Advisory Council, 2011). In addition to this, several other provisions exist, including established educational requirements for entry to practice, an established body of knowledge and scope of practice, and a demonstrated benefit for the health care system.

In Canada, most MLPs (apart from those working in Quebec) have completed a standardized national certification exam administered by the CSMLS and met the requirements for entry to practice in their respective jurisdictions (Canadian Institute for Health Information, 2008; CSMLS, 2019). Each province sets its regulatory requirements through provincial legislation outlining various standards, including the minimal qualifications to engage in the practice, required continuous learning, and disciplinary actions in the event of a violation of codes of conduct (CSMLS, 2019). Generally speaking, while the formal credential awarded varies, MLPs receive similar post-secondary education, competency-based training, certification, and job-specific skills required to practice with a high level of consistency nationally and to a lesser degree internationally. Canadian trained MLTs with undergraduate degrees, for example, can meet required equivalencies in other countries, including the United Kingdom, Australia, and

the United States. Accordingly, they must follow prescribed educational requirements of some type in all Canadian provinces, as well as the international community (American Society for Clinical Pathology, 2019; CSMLS, 2005, 2015; Institute of Biomedical Sciences, 2019).

In this regard, NL resembles other Canadian provinces. The national certification exam breaks down the expected competencies of entry-level technologists into eight categories as a means of ensuring the basic understanding of the practice can be demonstrated (CSMLS, 2015). Furthermore, the Newfoundland and Labrador Council of Health Professions (NLCHP) serves as the provincial regulatory body which oversees legislation enacted to establish provincial standards of practice. These categories are almost exclusively related to the technical aspects of the profession with some consideration for aspects of professionalism and ethics (Newfoundland and Labrador Council of Health Professions, 2019).

There are more than 40 accredited MLP training programs in Canada, each of which with curriculums that vary slightly and that take between two and four years for the MLT and one year for the MLA (Accreditation Canada, 2019). Both MLT and MLA programs are offered through publicly funded polytechnic, community college, or other non-university training programs. MLA programs are also frequently offered in private training institutes. In each of these programs, there is a high level of technical focus specific to Canadian content and technical workplace-related skills. As of the most recent national exam, for example, only 8%-12% of the existing MLT examination blueprint focuses on skills that are significantly outside the applied technical skills (i.e., communication and professionalism) (CSMLS, 2015).

In many ways, the profession fits the description of the purest form of positivist science in that nearly all information, data, patients, and duties can be quantified, analysed, and reported. In my experience as a practicing MLT and MLT educator, I have observed that standardization is

fundamental, and aspects of quality control, manufacturing principles, and compliance are deeply ingrained within the professional culture. Competency-based approaches to education are well-established with limited focus on any form of critical pedagogy, social learning, or cultural exploration. This standardization is observable through the similarity between medical laboratory training curricula in Canada, external accreditation, and a national certification exam ensuring compliance with the established standards of the profession (CSMLS, 2019).

To confirm this observed trend, I conducted a cursory review of 13 Accredited Canadian MLT programs (including both undergraduate and diploma level) using publicly available program websites. Through this cursory review, it was clear that most of the curricular content favours toward working in specific care settings, and is highly technical, workplace-focused, and contains minimal socially oriented content. As well, there is at the surface, virtually no formal consideration of professional identity development outside of limited aspects of professionalism and professional practice. Moreover, few MLP education programs in Canada appear to place significant value on any cultural, social, or liberal arts requirement at entry to practice. Instead, they focus heavily on the life sciences aspects of the profession (British Columbia Institute of Technology, 2019; Cambrian College, 2019; College of New Caledonia, 2019; College of the North Atlantic, 2019; New Brunswick Community College, 2019; Nova Scotia Community College, 2019; Northern Alberta Institute of Technology; Ontario Tech University, 2019; Red River College, 2019; Saskatchewan Polytechnic, 2019; Southern Alberta Institute of Technology, 2019; St. Lawrence College, 2019; University of Alberta, 2019). This trend is most likely a result of the existing framework of the CSMLS competency profile (CSMLS, 2019). This assertion is based only on surface-level review and in no way is meant to discredit any of

these programs nor the potential benefit of workplace learning, but merely to highlight the established normative educational process of the profession.

Despite this technical focus, in recent years, growing importance has been placed on the non-technical skills commonly associated with professionalism and professional development in line with changing expectations of employers, patients, and other health care fields (Garza, et al., 2012; Grant, 2007; Hardy, 2013). While these have yet to translate fully in the MLP education realm, there is a growing focus placed upon the changing role of the MLP. Unfortunately, except for the work of Grant (2004b, 2005) who completed an extensive study on the cultural aspects of the profession related to its notions of race, gender, and class and their intersections with positivist culture, additional research related to the ML profession is highly limited, and there has been little consideration of professional identity development, within the field. However, it is worth noting that there have been select studies within the United States which have addressed several social concepts within the field including professional identity and its implications for worker shortages (Butina, 2010; Butina & Schill, 2011; Grant, 2004a, 2004b; Keeping, 2000).

These ideas are discussed further in the chapter, but it is first valuable to address the aforementioned ongoing changes in the professionalism discourse and increasing professionalization of the field.

Professionalism Discourse and Professionalization of Laboratory Medicine

Within this section, I review existing literature related to the idea of professionalism and practices of professional socialization as forms of discourses, as well as situate the current cultural climate which exists within the field of laboratory medicine in Canada. A substantial component of professional identity development within the literature relates to the idea of professionalism, understood in this research as the demonstration of acceptable (both internally

and external to the profession) skills, attitudes, values, and behaviours prescribed through the discourse of a specific occupation (Anijar, 2004; Butina, 2010; Chiovitti, 2015; Evetts, 2014; Goldie, 2012; Grant, 2007; Hilferty, 2008; Ibarra, 1999; Karseth & Nerland, 2007; Kennedy, 2007; Kullasepp, 2008; Latshaw & Honeycutt, 2010; Murray, 2014; Shirley & Padgett, 2004, 2006; Wear & Kuczewski, 2004). Professionalism discourse is a central aspect of a profession and likely to impact professional identity development. Examples of this may include professional codes of conduct, ethics, or cultural expectations within the field. Thus, it is valuable to consider the literature surrounding professionalism discourses.

Perspectives of Discourse of Professionalism

Discourses can occur as shared social constructs arising out of complex language interactions and societal structures (Robson, Bailey, & Larkin, 2004). Shi (2005) approached discourse as culturally saturated forms of verbal communication or a set of diversified and competing constructions of meaning bound within groups. According to Shirley and Padgett (2004, 2006), the discourse of medical professionalism includes not only the words used to describe and carry out the activities of medicine, but also practices or the behaviours entailed, and the cultural and social institutions that exist within the field. Wear and Kuczewski (2004) reviewed the idea of developing professionalism within medicine as becoming part of the academic parlance taken up by administrators, clinical faculty, and professional organizations with the expectation of shared meanings and goals.

The field of education appears to contain similar notions related to teacher professionalism as discourse (Gur, 2014; Kennedy, 2007; Robson, Bailey, & Larkin, 2004). Anijar (2004) noted a striking resemblance of professionalizing discourses in medical education to those in other fields, including teacher education. Moreover, professionalism has been well

situated in the fields of medicine, nursing, and education, as substantial research exists related to how professionalism is taken up within formal training programs (Chiovitti, 2015). Within these fields, the core idea of requiring professionalism is ubiquitous and understood as a discourse that exists across various organizational contexts. This congruence allows for a deeper consideration of how the discourse of professionalism emerges across the organizational spectrum.

During their review of professionalism and professional development literature within health care contexts, Wear and Kuczewski (2004) raised concern regarding the professionalism discourse and how the language of academic medicine disciplines has defined, organized, contained, and made immutable a group of attitudes and behaviours which fall under the label of professionalism. This notion coincides with Clark and Newman's (1997) assertion that professionalism operates as an industrial strategy shaping the patterns of power and relationships around organizations. Hilferty (2008) considered professionalism as a socially constructed term, continually being defined and redefined through educational theory, practice, and policy. She also indicated that teacher professionalism serves as an enacted discourse of power in which professionalism is a discourse that seeks increased power socially. Moreover, these views of professionalism support the Foucauldian notion of discourse and identity as being considered not only as a specialized language but also governing who can speak, what is thought, and with what authority (Ball, 1990). Hilferty (2008) noted, for example, that for professional bodies or associations, the discourse of professionalism has traditionally been legitimized by the expertise (power) that executives hold about subject knowledge.

Fundamentally, professionalism provides an example of how discourse is more than talk and text; it includes the professional socialization processes and cultural practices within the workplace of various professions, which has a fundamental impact on the professional identity

formation. Karseth and Nerland (2007) explored how contemporary professional associations employ discourses of knowledge as a means of promoting professionalism as a process of professional socialization within the fields of nursing, education, engineering, and accounting. The idea of professional socialization has also been associated with terms including internalization and indoctrination (Hayden, 1995; Sparkes, 2002), thus leading to conclusions centered on both power and the idea of ideal professional identities. Professional socialization is also considered the process by which individuals acquire the values, attitudes, interest, skills, and knowledge of a group of which they are or seek to be a member (Merton, Reader, & Kendall, 1957; Waugaman & Lohrer, 2000; Weidman, Twale, & Stein, 2001).

This point is particularly salient when considering Tajfel and Turner's (1986) social identity theory in which a person will identify more closely with members from their social group than with members from other groups. Thus, professional socialization factors in the development of values, attitudes, interests, skills, and knowledge. A discourse of professionalism has been shown to position subjects' ways of being and offers identities through which people come to view their relationships within the social world (Clarke & Newman, 1997; Robson, Bailey, & Larkin, 2004; Sachs, 2001). As an example, studies in the field of early childhood education have looked carefully at how professionalism discourse shapes the professional identity of early childhood teachers (Gibson, 2013; Langford, 2005, 2008). Langford (2005), in particular, utilized a critical feminist standpoint framework to explore the idea of dominant discourse to explain the production of specific professional identities in early childhood education workers. She concluded that the various features of the discourse work in conjunction to reproduce an early childhood educator professional identity in line with a marginalized social position.

Factors Affecting Professionalism Discourse within the MLP Environment

The CSMLS (2015) competency profile includes professionalism as a fundamental category in the education of MLPs within Canada. Given that the ability to practice within Canada is guided by the completion of the CSMLS certification exam (except for Quebec), it is a logical conclusion that, during their initial training, MLPs are immersed within or exposed to the authorized discourse of professionalism at various points. The CSMLS notes the most important aspects of professionalism within the ML field is the need to meet the legal and ethical requirements of practice and protecting patients' right to a reasonable standard of care (CSMLS, 2019). Primary manifestations of this include compliance with legislation, recognition of limitations, participation in continuous education and training, and engaging in appropriate professional comportment (CSMLS, 2019). These concepts have been heavily explored within the field of nursing (Barriball, While, & Norman, 1992; Clouder, 2003; Gunn, Muntaner, Villeneuve, Chung, & Gea-Sanchez, 2018; Hodges, Paul, & Ginsburg, 2019; Shirley & Padgett, 2006; Stievano, et al., 2018), while only select studies have addressed these facets within the realm of medical laboratory science (Butina, 2010; Butina & Schill, 2011; Grant 2005b; Hardy, 2013; Isabel, 2016). Of particular importance is the regulatory aspects of the field as they fundamentally drive many of the nuances of the professional discourse.

The ML field has been undergoing significant shifts in its regulatory structure both nationally and provincially in the last decade, no doubt impacting professionalism practices and accepted standards (Hardy, 2013). Regulation of a profession consists of several processes and procedures that may include external assessment, validation, and accreditation (Council for Higher Education Accreditation, 2008). Regulatory bodies attempt to safeguard the public by upholding and enforcing regulation through an existing framework (United Kingdom

Department of Health, 2015). In Canada, there are direct links to the Canada Health Act, which functions to protect and promote the health of Canadians and to facilitate access to health care services without financial or other barriers (Government of Canada, 2018). This facilitation occurs through several functions, including maintaining registers of health care professionals, setting standards of conduct, education, and training, and the disciplining of those whom the regulatory bodies deem as unfit for practice (NLCHP, 2019).

A concrete example of the impact of regulation has been the promotion in virtually all health professional regulatory approaches of mandatory continuing education as a means of ensuring patient safety (Curran, Fleet, & Kirby, 2006a). The social acceptance of continuous learning through regulation within a professional group has grown in recent years, in part to an increase in expectations for greater accountability and professional competence of professionals (Friedman, 2012). This trend may impact the external perceptions of MLPs and is rooted in the idea that within health and social care, organizations are becoming increasingly isomorphic due to pressures from government policy and regulatory agencies (Reeves, Lewin, Espin, & Zwarenstein, 2010). For example, there is an accepted convention within the literature regarding professionalism, indicating individuals (including MLPs) must keep up with changes that occur within their profession and that regulation and professional development is considered a universally positive step (Bloom, 2005; Curran, Fleet, & Kirby, 2006a; Fisher & Pankowski, 1992; Grace, 2005; Latshaw & Honeycutt, 2010; Morgan, Cullinane, & Pye, 2008).

This conclusion is also affected by additional factors within the literature that contribute to the dominant professionalism culture. Neoliberalism, for example, is a political-economic theory that de-emphasizes or rejects government regulation of the economy, focusing instead on achieving goals through free-market methods of business operations (Webb, Briscoe, &

Mussman, 2009). This theory is of interest when considering the self-regulatory framework implemented in many Canadian health care professions, including the medical laboratory field. While debated definitions of neoliberalism exist, there are some common considerations worth noting. For example, many accept that it is rooted within liberal views on government intervention, and individual freedoms, and contains a theoretical assumption that the free functioning of the market forces leads to better utilization and allocation of resources (McGregor, 2001). Accordingly, neoliberal ideas have significantly impacted the discourse of fields that have inherent governmental or public components like health care and education. There has been considerable research surrounding the role that free markets continue to play in public enterprises (Backer, 2008; Foucault, 1977; Giroux, 1997, 2004, 2014). A white paper report by the Ivey International Centre for Health Innovation (ICHI), for example, described the looming concerns of the Canadian health care system focusing specifically on metrics of quality care, and cost, concluding Canada's health care system is increasingly costly (Snowdon, Schnarr, Hussein, & Alessi, 2012). While the paper made it clear there are needed improvements in the health care system, it is difficult not to observe the neoliberal influence in nearly every aspect of the Canadian health care system, specifically related to the notion of health care as a consumer product and the idea of measuring health care performance through quality and cost measures (Brown, Belfield, & Field, 2002; Snowdon, Schnarr, Hussein, & Alessi, 2012).

Unsurprisingly, these and other discourse factors have implications within the idea of professional identity. Woodrow (2008), for example, investigated how professional identity could be shaped by corporate involvement within early childhood education settings while Sachs (2001) highlighted the entrepreneurial professional teacher identity as exhibiting efficiency and accountability. Sachs further characterized the concept of an entrepreneurial identity as emerging

under conditions of increased public-sector management where teachers identify with the efficient, responsible, and accountable version of service put forth within increasing managerial discourses.

In this section, I have highlighted the literature surrounding the professionalism discourse of the MLP field, leading to its potential impact on identity. This is important to this study as a basis for situating the findings of this study to the field in considering the participants' developing professional identity in relation to the expectations suggested by the professional discourse of the field.

Theoretical Perspectives of Knud Illeris' Framework

As noted in Chapter 1, I adopted Illeris' framework as the theoretical basis for grounding this study. In the following sub-sections, I elaborate on the three key elements of the framework, that is, learning, identity, and transformative learning, based on literature related to Illeris' conceptualizations of them.

Dimensions of Learning

As this study was grounded in the field of adult education and explores the transformative learning of a cohort of post-secondary students, it is important to begin with a general conceptualization of learning, which extends into the adult learning realm. Adult education has a rich history of theories which attempt to describe and conceptualize various learning processes and determine how learning can (should) be conceptualized (see, for example, Bruner, 1966; Cranton, 2006; Jarvis, 2009; Kolb, 1984; Knowles, 1988; Mezirow, 1991; Piaget, 1952; Wenger, 1998). While each of these perspectives offers various lenses through which learning may be studied, within this work, I adopted Illeris' (2003a) basic conceptualization of learning,

as an entity which unites a cognitive, an emotional and a social dimension into one whole. It combines a direct or mediated interaction between the individual and its material and social environment with an internal psychological process of acquisition. Thus, learning always includes both an individual and a social element, the latter always reflecting current societal conditions, so that the learning result has the character of an individual phenomenon which is always socially and societally marked. (p. 227)

According to Illeris (2003a, 2011a), all learning involves interaction with the cognitive (content), emotional (incentive), and social (interaction) dimensions. While, Illeris' specific terminology for each dimension has changed slightly over the years, for consistency and manageability, I have chosen to utilize the original terminology throughout this work. Illeris (2003a) notes that all learning has a content of skill or meaning wherein the acquisition or assimilation of content is primarily a cognitive process. However, this is only one aspect of any learning process, which is a holistic endeavour, and as such, each dimension interacts with the other. This interaction is particularly important between the cognitive and emotional dimensions (Illeris, 2011a). As Illeris (2003a) explains, the learning process is both an internal emotional or psychodynamic one, as well as a cognitive one wherein psychological energy, transmitted through feelings, emotions, attitudes, and motivations, may influence the learning that occurs. Therefore, the emotional state of the learner at any given time has an impact on the learning process and is a vital consideration for the motivation of learning, particularly within an adult learning framework.

In addition to these two internally oriented dimensions of learning, Illeris (2003a, 2003b, 2011a) considers a third dimension: the social or environmental. As all individuals exist in an environmental context, learning always involves the interaction of the individual with the outside

world, including other individuals, so that learning becomes a social process as well as a mental one. This dimension brings to the forefront the positions of social constructivism, which understands knowledge as a construct that members of society determine together, as individuals create meaning through their interaction with each other and their environment. Moreover, it firmly grounds this research in adult education as the social environment including that of the workplace becomes a site of interaction. Fundamentally, knowledge construction (i.e., learning) occurs when individuals are engaged in social activities within an environment (Hayden, 2015; Illeris, 2011a; Kim, 2010). Illeris' three dimensions thus offer a way of conceptualizing adult learning in relation to this study. Given the nature of the clinical practicum studied, both the extended fields of experiential (Kolb, 1984, 2015) and workplace learning (Illeris, 2011), which are connected with social constructivism and Illeris' ideas, are also relevant to this study.

Though Illeris (2003a) himself is somewhat critical of Kolb's model, which he sees as over-emphasizing the cognitive dimension of learning, Kolb's work is valuable in understanding experiential learning. Kolb draws from numerous theorists, including John Dewey, Kurt Lewin, and Jean Piaget, to describe learning as a process in which "knowledge is created through transformation of experiences" (Kolb, 1984, p. 38). He devised a learning cycle, breaking down the learning process into four primary phases: concrete experience, reflexive observation, abstract conditioning, and active experimentation (Kolb & Kolb, 2017).

Experience-based education has become widely accepted as a method of instruction in post-secondary education (Kolb, 2015). Within the health care field, the clinical practicum often serves as direct exposure to workplace practice and is, in many instances, a fundamental requirement of entry to practice. As such, clinical practicums are a common requirement of many health care fields, including nursing, medicine, and medical laboratory science. This educational

model fundamentally considers the workplace as a learning environment that can enhance and supplement classroom-based education and can foster professional socialization and identity development through meaningful work experiences (Kolb, 2015). Therefore, through their experiences, workplace learning allows for students to become better professionals.

Identity as Multifarious

In addition to providing a valuable learning theoretical perspective, Illeris (2014a, 2014b) offers an understanding of the concept of identity and a perspective on the layered and multifarious nature of identity, which I have found useful. Like many other perspectives on multiple forms of identity (see, for example, Beijaard, Meijer, & Verloop, 2004; Beijaard, Verloop, & Vermunt, 2000; Gee, 2001; Kranz et al. 2014; Trede, Macklin, & Bridges, 2012; Rogers & Scott, 2008), Illeris (2014a, 2014b) notes identity develops in relation to affiliations including workplace and profession, family, national identity, and so on, as well as the individualized personal identity.

Illeris (2004, 2014a, 2014b, 2014c, 2015) provides a conceptualization for the general structure of identity as that of a central personal identity consisting of the core, personality, and preference layers as well as multiple “part-identities” as offshoots or transverse structures, each consisting of similar layers and connected to the central identity. According to Illeris (2014b, 2014c), the central personal identity consists not only of individual biographical core identity formed in youth but also the fluid social identity, which is today, subject to the “*liquid modernity*” described by sociologist Zygmunt Bauman (Bauman, 2000). Notably, the core identity remains relatively stable throughout life. In contrast, the personality layer is much more subject to change and serves as the site in which individuals relate themselves with others, communities, and groups. The preference layer is where many of the more mundane and

insignificant routines of daily life occur (Illeris, 2014a, 2014b, 2014c). For any individual, multiple layered part-identities also exist located around and within this central personal identity. Of particular importance is Illeris' (2014b) concept of the work identity, which is closely connected to and often integrated into the personal identity, and that which I consider in many ways analogous to the concept of professional identity. Illeris (2011a) himself states, "professional identity is a special type of work identity that is typically developed through a combination of vocational education and work" (p. 40).

Illeris (2014a, 2014b) proposes this layering of identity allows us to understand how critical aspects of learning—in particular, transformative learning—can occur. Regarding the personality layer of the central identity, Illeris (2014a) points out that, "It is also in this area that we find what Mezirow referred to as meaning perspectives, frames of reference, and habits of mind." (p. 157). Moreover, according to Illeris (2014a, 2014b), it is in this layer in which we are willing to make changes with some convincing, and it is in this layer demands for transformative learning tend to occur. While the personality layer has a high degree of continuity across multiple part-identities (Illeris, 2014b, 2014c), it is simultaneously more flexible, serving as the site in which individuals relate themselves with other individuals, communities, and groups and is thereby subject to changes when the individual experiences new conditions. This concept directly links to what Mezirow (1981, 1991, 1997, 2012) referred to as meaning perspectives and schemes, and is an essential consideration for any study of transformative learning. Mezirow (1991), for example, considers meaning perspectives as broad sets of predispositions including sociolinguistic, psychological, and epistemic codes resulting from psycho-cultural assumptions, while a meaning scheme is "the constellation of concept, belief, judgment, and feelings which shapes a particular interpretation" (Mezirow, 1994, p. 223).

This consideration leads to what Illeris (2014a, 2014b), describes as part-identities, including most importantly working or professional identity—development of which is a learning process that unfolds as individuals engage in and through shared experiences (Archer, 2008; Arreciado Marañón & Isla Pera, 2015; Beijaard, 1995). According to Illeris (2014b), work identity is closely connected to and, in most cases, more or less integrated into the central personal identity. Thus, the learning processes by which the qualification for work take place are deeply integrated. Notably, while the core aspects of any part-identity are likely to be relatively stable and analogous to the central personal identity, aspects of the personality and preference layers of each part-identity can be influenced by the experiences in which individuals participate or the discourses to which individuals are exposed (Flores & Day, 2006; Gee, 2001; Gibson, 2013; Gur, 2014; Illeris, 2014a, 2014b; Zacrisson & Assarsson, 2008).

Thus, Illeris' (2014b) perspective of identity is particularly useful when used to focus on specific components or part-identities, including the professional/occupational identity, as one component of the total identity of the individual, which develops under specific conditions. In principle, each part-identity can be differentiated into a relatively stable core area surrounded by a more flexible layer in which changes typically can take place. Furthermore, we can consider that the development of a professional part-identity (or any other part-identity for that matter) can and will affect the personal identity as well as other part-identities, as these are deeply intertwined. As I explain in the following section, Illeris (2014b, 2014c) relates these ideas about identity to the concept of transformative learning.

Transformative Learning and Identity

As Illeris (2014c) notes, the concept of transformative learning is central to much adult learning scholarship, although critiques of the theory remain. There is the question of “what form

transforms” (Kegan, 2000, p. 47) by which Kegan discusses the difficulty in quantifying transformative learning, as well as calling of the nature of transformative learning into question (Newman, 2012, 2014). Illeris (2014b) provides a rational response to both critiques, arguing that “learning which implies change in the identity of the learner” (p. 40), *is* the mark of transformative learning.

Transformative learning finds its origins in Mezirow’s (1981; see also Kroth & Cranton, 2014) study of women returning to college, and the changes and self-reflection they experienced. Connected with the social constructivism, and experiential learning that can occur within occupational contexts, transformative learning offers one way to consider the outcome as individuals respond to professional socialization processes through a series of personal negotiations and begin to build their professional identity (Skorikov & Vondracek, 2011).

Mezirow proposed that every individual has a view of the world based on a set of assumptions derived from the individual’s upbringing, life experiences, culture, or education, and thus he developed an approach to learning primed by a shift in this worldview (Christie, Carey, Robertson, & Grainger, 2015; Kitchenham, 2008; Mezirow, 1981, 1991, 1997, 2012). This shift in worldview falls in line with Mezirow’s ideas relating to the human search for meaning, understanding, and coherence in the individual experience (Fleisher, 2006). Mezirow developed a linear model that procedurally laid out his view of transformative learning, including 10 initial phases incorporating aspects of a disorienting dilemma, critical assessment, exploration of options, acquisition of knowledge, and the reintegration of perspective (Kitchenham, 2008, Mezirow, 2012). Yet, transformational learning should not be confused with those routine changes that can occur during the development of an adult as this type of learning implies a

qualitatively new formation or capacity in the learner—it recognizes that learning can be something more than the acquisition of new knowledge and skills (Illeris, 2017).

Many authors have built on the transformative learning premise incorporating aspects of Kolb's learning cycle, Maslow's hierarchy of needs, and the emotional dimensions of perceived transformations (Jarvis, 2008; Malkki, 2010; Wilson & Madsen, 2008). Jarvis (2008, 2009, 2012), for example, notes the aspect of disjuncture in our lives as a means of initiating transformative change while Cranton (2006), takes it a step further discussing aspects of the inevitability of transformation in learning. The perspectives on transformative learning are therefore highly varied and multifaceted, yet there are commonalities. While experience may be considered the trigger for many forms of transformative learning as authors discuss, fundamental to Mezirow's perspective is the notion of reflective practice (Kitchenham, 2008; Fleisher, 2006; Mezirow, 1981, 2012; Taylor & Cranton, 2013). Critical reflection allows learners to reflect on those learning experiences that one cannot accommodate into their prior life structure (Merriam, Caffarella, & Baumgartner, 2007). Several proposed models attempt to understand critical reflection as well as, to a degree, differentiate between types of reflective processes. As such, in recent years, there has been a shift towards more humanistic or holistic approaches to such reflection (Merriam, Caffarella, & Baumgartner, 2007).

Fundamentally, there is a critical evaluation of events that allows us to incorporate new concepts within our perceptions. Individuals navigate a series of personal negotiations with varying levels of difficulty as they work to acquire new aspects of their identity (Cruess, Cruess, Boudreau, Snell, & Steinert, 2015). Not unimportantly, these critical evaluations are likely to occur in specific circumstances, and often during the mid to late twenties (Illeris, 2003a). At this point, most individuals have acquired a reasonably stable and coherent personal identity, which

then provides a base for more comprehensive and vital transformative learning concerning all parts of the identity (Illeris, 2014a, 2014b). Not the least of which concerns an individual's work or professional identity.

Theoretical Perspectives of Identity

The central concept framing this study is identity. In the previous section, I discussed identity and its connection to transformative learning based on Illeris' (2003, 2014a, 2014b, 2014c) work, as this was the theoretical perspective I chose to frame this study. In this section, I consider other ways in which identity has been conceptualized with the intent to provide a broader landscape of identity in relation to where this study is situated.

The concept of identity has been a preoccupation of philosophy, psychology, and social science inquiry for centuries. Aristotle distinguished identity in its numeric meaning as equivalence from an identifier that defines an object as the individual (Sollberger, 2013). Thus, no two distinct things may exactly resemble each other lest they would be indiscernible and fundamentally one thing philosophically; thus, creating an identity. Through this understanding, the idea of the uniqueness of the self is emergent (Farmer & Van-Dyne, 2010). However, it is necessary to problematize this concept as within contemporary social sciences, the concept of identity is teased out considerably to include aspects beyond the "core" identity of self, such as the concepts of multiple identities and identity development (Gee, 2001; Gee & Crawford, 1998).

Perhaps one of the most well-known psychological conceptualizations of identity is found within Erikson's (1963, 1964, 1968, 1982) seminal writings on identity formation in adolescence, while other approaches in psychology or psychometrics like the Myers-Briggs have explored the modernist perspective of personality "type" as a component to identity, indicating identity is stable and mostly unchanging (Gibson, 2013; Sharp, 1987). Others have noted that

personality is merely a distinct fluid component of an individual's identity (Olver & Mooradian, 2003; Oyserman, Elmore, & Smith, 2012). While these are more cognitively aligned, other perspectives on identity exist which include identity as a social construct created in language, with people's perspectives co-created and negotiated through a continuous cycle of development and renewal (Bell, Campbell, & Goldberg, 2015; Chiovitti, 2015), or as imaginations which can be individual, multiple, or collective and something that develops continuously throughout one's life (Beijaard, Meijer, & Verloop, 2004; Beijaard, Verloop, & Vermunt, 2000; Trede, Macklin, & Bridges, 2012). Jubas (2013), utilized a metaphor of identity as being related to a translucent crystal, in which the many facets of identity work together to shape the appearance and experience of identity in unique ways, while simultaneously allowing each facet to be turned towards the observer allowing for a lens for which to observe. Phelan and Kinsella (2009) used the metaphor of identity as a fabric, constructed with many different historically and culturally situated threads, including age, gender, ethnicity, or occupation.

Moreover, there are more positivistically aligned researchers who assert the idea that the biological processes which govern our brains determine identity. Kranz et al. (2014), for example, explored the notion that gender identity is predetermined in fetal development while Gee (2001) noted that identity can be a partial state, as defined and influenced by our natural state, such as the case of children with attention deficit hyperactivity disorder, noting that an individual can embody a multitude of identities at any given time. Gee further discussed the notion of identity as being a "kind of person" an individual is, at any given point in time, which can change from moment to moment. An individual may take on varying properties based upon both the internal characterization but also from that of the social observer such as being a student, a female, a doctor, any other definable characteristic. Gee offered up four ways in which

identity can be considered, including aspects of state, traits, positions, and experiences along with the associated forms of power which exist to govern them. Gee's perspective offers valuable insight into the concept of multi-identity, providing a set of tools to explore and evaluate identity construction as the process by which individuals take up aspects of their own identity.

While Gee's (2001) perspective offers a particularly valuable framework for interpreting who individuals are relating to the social world, it is, of course, only one viewpoint of the study of identity. Through Gee's acknowledgment it does not consider another frequently encountered notion; the common understanding of identity within cognitive realms as a phenomenon in which individuals each have a central "core" identity consisting, according to some psychologists, of aspects such as gender, emotionality, temperament, desires, and behaviour (Hitlin, 2003; Illeris, 2014a, 2014b; Sneed, Whitbourne, & Culang, 2006). This core identity is an aspect of developmental psychology taken up frequently (Gibson, 2013; Hitlin, 2003; Sharp, 1987; Sneed, Whitbourne, & Culang, 2006; Sollberger, 2013) and fundamentally is considered relatively stable throughout one's life, though it is not immovable nor inalterable.

Tajfel and Turner (Tajfel, 1978; Turner, 1975; Tajfel & Turner, 1979) offered another important consideration known as social identity theory when discussing the concept of identity considering and accepting that a portion of an individual's identity or multiple identities is derived largely from membership within the social group. This consideration has many implications when we consider the labelling of groups from the outside, for example, using Gee's (2001) N-identity or I-identity as well as Moje, Luke, Davies, and Street's (2009) "*identity as difference*" metaphor wherein individuals are distinguished from one another by their group membership and the associated ways of knowing, doing, or being, which are held by the group

membership. Individuals may belong to multiple social groups, such as ethnicity, gender, or class. These groups contribute to their sense of identity, which is then prioritized by the individual (Moje, Luke, Davies, & Street, 2009). These social groups can be considered falling under the realm of a collective identity. Gee and Crawford (1998) indicated that we take on different identities, depending on the social setting, but these identities form relationships and become interrelated, which necessitates the navigation of these relationships. This conclusion fundamentally brings forth the idea of “*ingroups*” and “*outgroups*” of which individuals must learn to navigate. (Tajfel, 1978; Turner, 1975; Tajfel & Turner, 1979).

Moreover, social identity theory surmises that individuals strive to achieve or to maintain a positive social identity. This idea derives from the favorable comparisons between the ingroup and outgroups of which individuals subscribe. Furthermore, it concedes that when social identity is unsatisfactory, individuals will strive either to leave their existing ingroup and join more positively distinct groups or function to make their group more positive (Ashforth & Mael, 1989; Branscombe, Ellemers, Spears, & Doosje, 1999; Tajfel, 1978; Turner, 1975; Tajfel & Turner, 1979). Recently arguments surrounding social identity theory have called into question whether social identification leads to increased positive ingroup rather than outgroup degradation (Reynolds, Turner, & Haslam, 2000), bolstering the idea of group identity development on a much larger social scale.

Theoretical Perspectives of Professional Identity

While in the previous section I considered identity in general, in this section, I address it specifically in terms of professional identity, which is directly related to this study with the focus on MLPs’ professional identity.

Within the broader literature regarding professional identity, there are numerous interpretations of “profession” and “professional identity” (Beijaard, Meijer, & Verloop, 2004; Branscombe, Ellemers, Spears, & Doosje, 1999; Gee, 2001; Gibson, 2013; Gur, 2014; Hitlin, 2003; Ibarra, 1999; Rogers & Scott, 2008). Several of these offer a somewhat consistent interpretation that informed my thinking about MLP’s professional identity. For example, in their meta-analysis of teacher professional identity studies, Beijaard, Meijer, and Verloop (2004) noted several descriptions of professional identity. These included professional identity as something that individuals shape through reflection, professional identity as a complex dynamic equilibrium between personal self-image and roles one feels obliged to play, and professional identity as a percolated understanding and acceptance of a series of competing and sometimes contradictory values, behaviours and attitudes ground in the life experiences of the individual (Antonek, McCormick, & Donato, 1997; Samuel & Stephens, 2000; Volkmann & Anderson, 1998).

Other definitions outside the teaching domain indicate professional identity as a way of being or relating to how individuals see themselves in reference to a group of occupational or institutional peers (Hayden, 2015), or as a sub-identity that emerges due to condensation of individual and social perceptions around themes that are related to a specific occupational environment (Gur, 2014). Gecas and Burke (1995) noted a central aspect of identity is its fixing of an individual’s place in society or culture through relationships to others, while Slay and Smith (2012) extend this notion indicating that membership in a profession influences self-definition and shows how others think about an individual.

Numerous models have been developed to understand key characteristics associated with professional identity in various fields. Kunhunny and Salmon (2017), for example, provide a

model of the professional identity of the clinical research nurse as composed of aspects related to professional practice, views regarding the role, and personal influencing factors. Preston-Shoot and Mckimm (2010) proposed a model of professional identity formation relating to medical ethics as being composed of personal values, professional ethics, and codes of practice. Han (2017) provided another model wherein a professional identity of English teachers can be partially composed of personal factors such as national identity, public servant identity, or even learner identity. Fundamentally, professional identity can be broken down into any number of possible variables specific to the circumstances.

The concept of professional identity is also one that, while internalized by the individual, can be considered relative to a social group. A professional identity may be considered an identity within the multi-identity in which individual's construct an image of who they are as a professional (Slay & Smith, 2011). According to Bruss and Kopala (1993), professional identity is "an attitude of personal responsibility regarding one's role in the profession, a commitment to behave ethically and morally, and the development of feelings of pride for the profession" (p. 686). While according to Caza and Creary (2016), professional identity is an important cognitive mechanism that affects workers' attitudes and behaviours in work settings and beyond. Moreover, preparation and training for a career at particular junctions in an adult's life is a significant part of identity development as an individual's working life is a substantive force in their personal identity (Cruess, Cruess, Boudreau, Snell, & Steinert, 2015; Illeris, 2011a, 2014b; Skorikov & Vondracek, 2011).

Professional identity within this context can further be defined more specifically as collective attributes, beliefs, and values people use to define themselves within the specialized skill and education-based occupations (Benveniste, 1987; Ibarra, 1999; Schein, 1978). Ibarra

(1999) further indicated that individuals adjust and adapt their professional identity during periods of career transition due to the professional discourse of which they are exposed, while Wenger (1998) noted that the professional socialization experiences through a community of practice are of specific importance in professional identity development.

Studies on Professional Identity of Students of MLP and Comparable Fields

Having considered the theoretical perspectives of discourse and identity which exist within the literature, in this section of the chapter, I review the existing literature related to empirical studies of professional identity.

Research on MLPs is limited, particularly regarding identity and MLP students. My literature searches of several journals directly and indirectly devoted to the field (including Clinical Laboratory Science, and Laboratory Medicine) focusing on student MLPs, uncovered minimal peer-reviewed studies; the few studies conducted are from the United States. Thus, to highlight studies related to professional identity, in this section, I focus on published studies on MLP students as well as for other comparable professions with clinical or field experiences for students in training, specifically nursing and teaching. The parallels offered from the perspectives of both nursing and teaching include similar professional education timeframes, clinical or practicum experiences, roles in primary patient or student care, and the regulatory mechanisms that are currently in place.

MLP Students' Professional Identity

While student identity development has been a well-researched topic in many fields including health care and education (Arreciado Marañón & Isla Pera, 2015; Antonek, McCormick, & Donato, 1997; Chiovitti, 2015; Cruess, Cruess, Boudreau, Snell, & Steinert, 2015; Goldie, 2012; Kullasepp, 2008; Mylrea, Sen Gupta, & Glass, 2017; Timoštšuk & Ugaste,

2010), there is significant under-representation of research linking identity and identity development within the medical laboratory professions. Select studies have focused on the learning and development of MLP students with inroads to identity. Latshaw and Honeycutt (2010) offered one such study. They collected student perceptions regarding professionalism at various stages throughout their educational program. After obtaining reflective reports throughout their educational program, they concluded that student professional perceptions expanded following service-learning participation. Evidence of this included reflections indicating that MLPs should take personal responsibility to collaborate with other health care professionals, educate the community, and exhibit pride in the medical laboratory profession.

Isabel (2016) examined the learning perspectives of MLP students completing their clinical education through interview processes with students, both before and after their exposure to the clinical community of practice. Following the interview analysis of eight participants, as well as field observations, her conclusions centered on the role of the clinical preceptor as being a central factor of MLS student learning. Another of Isabel's findings was that successful learning during clinical practicum depends on the student's ability to be organized, focused, and maintain a positive attitude throughout the program.

Nasr and Jackson-Harris (2016) focused on the factors that influence student success rates in clinical laboratory science programs. This study drew significant conclusions surrounding the role of clinical practicum. In their study, 57% of respondents indicated that the greatest strength of their program was the quality of the internship that they were required to complete, suggesting that the clinical practicum is a central aspect of the successful completion of their program. Concerning education and training programs, McClure (2009), and Beck and Doig (2007) indicated that many students who are entering the clinical laboratory science

profession do not see the profession as their final career choice, instead, seeing it as stepping stone to other health care fields, further suggesting a poorly developed professional identity.

Though studies have examined professional attributes and behaviours (Schill, 2012, 2017) perceptions of learning (Isabel, 2016), and clinical preceptor identity (Miller, 2014), few scholars have attempted to describe the MLP professional identity directly, and there were no identified studies which focused on the professional identity development of student MLPs during clinical practicum in Canada. Fortunately, other professions such as nursing and education offer suitable comparison due to their similar education programming structure, established research basis, and related internship or preceptorship model of experiential learning.

Nursing Students' Professional Identity

Undergraduate nursing students offer a substantial analogue to the MLP student, particularly in a Canadian context. Nursing and MLP studies share similar program lengths, program rigour, areas of study, and fundamentally require exposure to the clinical community of practice. Given the breadth of research available within the nursing field and specifically nursing students, it is valuable to consider this research.

Arreciado Marañón & Isla Pera (2015) explored how formal training and professional socialization contributed to the process of nursing students' construction of their professional identity. Through an ethnographic study of third-year nursing students, they noted that one of the primary components of professional identity formation was within the clinical placements, which serve as the main element of professional identity formation. They concluded that clinical practicums provided an opportunity to experience professional reality and allow students to choose which nursing model they most identify. They also indicated that the clinical placement mentor was an essential figure in professional identity construction. This inference mirrors the

conclusions drawn by Isabel (2016) as well as other studies which note practicum experience is one of the most significant contributors to emerging professional identity (Brown et al., 2003; Craig, Moscato, & Moyce, 2012; Duchscher, 2008; Johnson, Cowin, Wilson, & Young, 2012).

Furthermore, relating to the concept of mentor and or the role of the educator, nursing school is a critical period for the development of professional identity, and the role of the clinical educator has received attention (Johnson, Cowin, Wilson, & Young, 2012). Etheridge (2007) found that new graduates develop professional identity significantly through clinical experiences as students begin with insufficient understating of the nurse's role. Through a mixed-methods analysis of graduates of Bachelor of Nursing programs in the Australia, Brown, Stevens, and Kermode (2012) concluded that the development of nursing identity was largely resultant from pre-existing perceptions of nursing identity and through interaction with learning and clinical environments and that during the professional socialization process, student nurses not only learn and perfect knowledge but also assume nursing values.

Fitzgerald (2016) examined the experience of nursing professional identity development of students in their final year of study, recommending that nurse educators include more clinical and experiential learning along with guided reflection to help influence professional identity formation. Candela and Bowles (2008) noted a wide disparity between how employers and educators described new graduate nurses. Their research suggests that employers felt graduates were unprepared for independent practice relating to skills, including professional values and ethics, which may fall within the concept of identity. The clinical experience is no doubt an essential site of identity formation within nursing as clinical experience provides the exposure to vital aspects of professional practices. This experience includes exposure to death, illness, or

disabilities, which function as important moments of professional identity development (Cooper, Taft, & Thelen, 2005).

In addition to aspects of schooling associated with professional identity, the public image of nursing has shown to be of importance. ten Hoeve, Janse, and Roodbol (2013) linked the concept of nursing public image as an essential aspect of the individual identity. They discuss the historical aspects of nursing as being directly linked to the historically male-dominated profession of medicine and how nursing is often viewed by the public both as inseparable but also subservient to the medical field, thus negatively impacting their sense of professional identity. Through a meta-analysis of over 1200 articles, they conclude that increasing nursing visibility is central to creating stronger positions within health care organizations.

Teacher Candidates' Professional Identity

Along with research within the professional identity formation in nursing, there has been significant research within the realm of education. The development of teacher identity has been a significant area of study in educational literature with countless peer-reviewed articles and texts on the subject (Izadinia, 2012; Williams, 2013). Gur (2014) analysed teacher candidates through group discussion, which indicated that one of the primary aspects of professional identity development was an awareness of the profession. For example, teacher candidates who have chosen teaching practice as a career before entry into post-secondary education did so because of experiences during their formative education years. Izadinia (2012) conducted a meta-analysis of 29 empirical studies to identify the key focus of ongoing research, concluding that all studies suggested that having student teachers reflect on their values, beliefs, feelings, and teaching practices, aided in shaping their professional identity. Moreover, she concluded that

teacher candidate identity could be defined using various criteria, but it is the experiences within the learning communities that ultimately shaped their identity.

In her study of teacher educators' construction of professionalism, Murray (2014) noted what student teachers learn during their initial training, is significantly influenced by those who teach them along with the content of the curriculum they are exposed to, indicating a substantial tacit influence associated with professional identity formation. Meanwhile, Timoštšuk and Ugaste (2010) used semi-structured interviews to explore student teachers' professional identity formation to conclude that student teachers associated their professional identity and practices with those espoused by their instructors. Furthering this conclusion was their findings that teacher identity was described predominantly through their experiences in the classroom.

Nikel and Zimmer (2018) conducted a longitudinal mixed-methods study to investigate the development of teacher candidate professional identity throughout a four-year degree program, in which approximately 65 teacher candidates completed a five and 14-week teaching practicum. They concluded that basing teacher education within the community of practice of the school invited richer identity development due in part to the multiple opportunities for experimentation and reflection. Furthermore, they noted that at least half of the teacher candidates describe reaching a point during their practicum when they felt discouraged due to stressful circumstances and an aspect of resilience after moving through this phase.

A similar study by Lamote and Engels (2010) described the development of 64 student teachers' professional identity in a three-year teaching program for secondary education teachers. In this instance, they focused on four key indicators of identity development, including professional orientation, task orientation, teacher self-efficacy, and commitment to teaching, to explore which professional identity profiles prevailed over three years. They concluded that the

development of professional identity was measurable following only half an academic year and that significant shifts in students' perceptions occurred after workplace experience. Most notably that the work placement creates a new 'membership' in that the students identified with becoming members of a professional group and that professional identities are vulnerable during the first confrontations with teaching. There are no doubt consistencies between the exposure of pre-service teachers to teaching practicum and that of the MLP exposure to clinical practice.

Research on MLP

In the previous section, I addressed studies dealing with MLP students and students of comparable professions. In this final section, I extend the literature review by focusing on studies dealing with practicing/experienced MLPs. Notably, while the overarching literature on Canadian practicing MLPs and the broader field of MLPs is also limited, my literature search did uncover more studies on practicing MLPs than for student MLPs. But these studies focus more on the applied methods within the field (i.e., the science) than on the practitioners who perform the work (i.e., the people). Studies related to MLPs' educational and professional practice include Fisher and Pankowski (1992), Grant (2004a), and Hardy (2013). In what follows, I elaborate on other studies with particular attention to Canadian and United States studies of MLPs.

Using a narrative approach and critical feminist lens, Grant (2004b) explored the epistemological perspectives of the profession and its practitioners deeply, including aspects of professional ideology, gender, social class, and the historical organizational structure which shapes the profession today. Following the collection of data from 851 Canadian "general" MLTs, Grant (2004b) concluded several motivators regarding why individuals enter the medical laboratory profession in the first place, pointing to individuals identifying with "being good at

math and science, the opportunity for hands-on experimentation, and, serving patients and the health care system” (p. 125). Grant’s (2004b) work was particularly relevant to ongoing considerations of gender within the field as she described consistent historical, political, and power dynamics present within the laboratory profession across Canada.

In the United States, Butina and Schill (2011) explored the professional identity of experienced MLPs and identified three viewpoints from practitioners, including misunderstanding by other health professions, general unawareness of the public of the profession, and a poorly developed professional identity. Through a narrative study of new clinical laboratory personnel, they noted misunderstanding of the public and other health care providers contributed significantly to a lack of a strong professional identity and has the potential to impact retention within the field negatively. They further concluded that the development of collective professional identity within the laboratory profession has been difficult due to variations in professional organizations and the inclusion of different levels of specialization within clinical laboratory practitioners.

Using a modification of Hall’s (1968) professionalism scale, Schill (2017) assessed the attitudes and behaviours of 45 early career medical laboratory scientists, concluding that less experienced MLPs self-identified as members of the profession but had not transitioned to full enculturation. Schill (2017) outlined that the medical laboratory profession had faced a continual workforce shortage for more than twenty years noting poor retention of graduates, increasing retirements, and insufficient educational programs. This trend has created an aspect of urgency around the profession as diagnostic testing is increasing, while the number of practitioners fails to meet this increased demand. Thus, potential shortages of practitioners have the potential to impact the delivery of patient care.

Before Schill (2017), Butina (2010) had explored themes related to the professional identity of MLPs within the United States, proposing that exacerbating these laboratory personnel shortages was a professional identity that is inconsistent, underdeveloped, or absent. Coincidentally personnel shortages within the United States are mirrored within Canada today (CIHI, 2008, 2015), and the lack of qualified personnel has been a consistent source of concern for the CSMLS and provincial governments (CIHI, 2015; CSMLS, 2019). Butina (2010) further indicated ongoing shifts within the profession, variations on initial entry to practice qualifications, and limited awareness of the profession within the public perception were primary factors related to an underdeveloped professional identity. Grant (2004a, 2004b, 2007) noted similar findings related to limited public awareness of the profession within Canada.

During a case study analysis of interprofessional learning of medical laboratory science students in the United States, Salazar (2017) discussed how participants' expressed difficulty in being recognized with a professional identity within the health care team, considering identity as the ways of being or belonging in the community of health care. Grant (2004b, 2007) touched upon similar points within her seminal work, noting the medical laboratory profession within Canada has experienced similar challenges related to awareness and a considerable misunderstanding of the profession. While the CSMLS serves as a central point of commonality within Canada, variations in regulation at the provincial level exist, which may contribute to this underdeveloped professional identity.

Some research expanded beyond the clinical practitioner. Miller (2014), for example, explored the professional identity of MLPs in the United States who had taken a teaching role in a clinical setting in addition to their routine clinical practice. In Canada, these individuals, commonly referred to as preceptors, often serve the role of both mentor and instructor within the

routine applied practice. Though Miller's research may fall within the realm of teacher professional identity, she noted a strong perceived need to stay up to date with the techniques of the clinical realm, and that preceptors saw themselves as being responsible for passing along professional knowledge to the next generation of laboratory practitioners. In an exploration of attitudes of MLTs towards continuous learning in NL, Hardy (2013), observed a similar perceived need to remain up to date. This point is particularly important when one considers research within the fields of nursing and other health care fields which indicate the significance of continuing educational practices in shaping professional identity (Andrew, Ferguson, Wilkie, Corcoran, & Simpson, 2009; Deppoliti, 2008; Fitzgerald, 2016; Zarshenas et al., 2014).

Conclusion

While there have been some studies related to the learning perspectives of MLP students, studies focusing specifically on identity have been highly limited. The few existing studies, as well as studies in comparable fields such as nursing and education, suggest the importance of exploring professional identity formation to inform professional education programs. This notion expands to the realm of the MLP, but the lack of studies on MLP students is of concern and requires attention. While some work has begun mostly with a focus within the United States, there is a need to continue study on the MLP from within the Canadian context, and this study contributes to the field in attending to MLP professional identity development.

This chapter examined the medical laboratory professions' roots and situated the study in a Canadian context, further discussing the extant literature relating to professional identity and professionalism within the MLP and related fields. The interrelationship between ideas of professional identity formation as it relates to professional discourse serves as a point of

consideration for future examination of the professional identity formation of MLP students within a contemporary educational program.

This chapter serves to situate the environment in which the profession currently operates, and which medical laboratory science students engage during their educational program. In the next chapter, I outline the chosen methodology of the study.

CHAPTER THREE: METHODOLOGY

Overview

In this chapter, I present the methodology for addressing the research questions in this study, with the aim to explore the nature of students' developing professional identity based on their engagement in a student clinical practicum in a contemporary MLP education program. The specific research questions are:

1. What professional identity characteristics do MLP students develop during the completion of their clinical practicum experience? How do these characteristics differ from those which existed at the beginning of the practicum?
2. What experiences during the clinical practicum were related to transformative learning and the transformation of the students' professional identity?
3. How does the students' developing professional identity relate to the perspectives of the medical laboratory profession or field?

I first discuss the choice of a qualitative case study and its suitability to the research. I then map the chosen case study framework and describe the process of data collection and analysis. Finally, I discuss case study inquiry as an appropriate choice as well as provide details on the participant sample and the methods used to conduct the research and to analyse the data.

Perspectives of Case Study

According to Creswell (2012), qualitative research consists of exploring a problem and developing a detailed understanding of a central phenomenon. Often defined as interpretive research, qualitative research relies heavily on observers defining and redefining the meanings of what they see and hear (Stake, 2010). Qualitative research has significant value in that data is collected to learn from study participants in an organic and evolving setting. Specifically, a

qualitative case study is recommended as a meaningful way to open up phenomena where there is very little known, as is the case with the medical laboratory profession.

Case study is a methodological approach that explores a phenomenon in-depth and examines the context under which this phenomenon occurs, thus, allowing for an intensive description and analysis (Bloomberg & Volpe, 2016; Cohen, Manion, & Morrison, 2011; Yin, 2009). Case study research is well suited and has a rich history in both education and health care research (Mohammed, Peter, Gastaldo, & Howell, 2015) as it can serve as a systematic inquiry into an event or set of events, which aims to describe and explain the phenomenon of interest (Bromley, 1986, 1990). It is of specific value as a strategy of answering questions of “how” or “why,” when the researcher has little control over events or when the focus is on a contemporary phenomenon with a real-life context (Yazan, 2015). It serves to provide a unique example of real people in relational situations, enabling readers to understand ideas more clearly rather than presenting them with abstract theories (Cohen, Manion, & Morrison, 2011).

Case study has become a popular method of research within education and social science, and significant theorists include Stake, Merriam, and Yin (Yazan, 2015), each of whom offers a differing view and approach (Cohen, Manion, & Morrison, 2011). While Merriam and Stake both offer a valuable perspective and approach to case study, emphasizing a constructivism epistemological leaning, Yin’s approach demonstrates more positivistic leanings focusing heavily on the ideas of “units of analysis” and “chain of evidence” which allows a researcher to track through each step of a case study from its inception to its conclusions (Cohen, Manion, & Morrison, 2011; Yazan, 2015).

In this study, the focus is more on Yin’s approach that allows for a deep understanding of the social and historical circumstances that shape a phenomenon and how experiences shape the

actions and perceptions of people (Mohammed, Peter, Gastaldo, & Howell, 2015). According to Yin (2014), case study can explain, describe, or explore events or phenomena in the everyday contexts in which they occur. Yin (2009) describes several types of case study in terms of their outcomes, including exploratory, descriptive, and explanatory coinciding well with Merriam's classification of descriptive, interpretative, and evaluative studies (Cohen, Manion, & Morrison, 2011). Yin (2018) further describes four main case study designs, which include single holistic, single embedded, multiple holistic, and multiple embedded. Single case designs allow for a focus on an extreme or unique case, while multiple case designs function as comparative case studies that can explore impacts from various perspectives. According to Yin (2014), single case designs are useful in circumstances, including those of a longitudinal nature, which involves studying the same case at two or more points in time. The desired time intervals relate to Yin's assertion of "before" and "after" logic associated with some critical event or learning intervention. In this instance, the exposure to the profession and its associated practice through clinical practicum experience serves as this intervention.

Moreover, an embedded case study is one that contains more than one subunit of analysis within the primary unit of analysis, which, in this research, is the layered concept of professional identity amongst a group of MLP students. This research involved the exploration of what informs professional identity (which constitutes sub-units of attributes, beliefs, and values), and how clinical practicum informs professional identity within a select population over a period or specific intervention. Therefore, I adopted a single case embedded design, wherein the case is the cohort of CNA students within the specific program, the unit of analysis is the professional identity, and the subunits of analysis are Illeris' (2014a) layered concepts of identity.

As this study was an investigation of a specific learning intervention (exposure to clinical practice) and its impact on the developing professional identity, Yin's approach was considered appropriate due to the study of the case at two specific points in time. This approach was in line with the theoretical perspective that professional identity formation is an active learning process influenced during the clinical practicum, and that shift in the identity components may occur at critical points. Yin's (2009) assertion of "before" and "after" logic associated with some critical event or learning intervention was highly suitable. This approach was also compatible with my epistemological leanings in that I understand clinical practicum has an impact on the professional identity much in the same way that an outside variable has an impact on any experiment.

Study Participants

This research focused on one cohort of medical laboratory technology (MLT) students in their final year of study at the College of the North Atlantic (CNA) in NL, Canada. Participants recruited were from the third year of the MLT program. Fortunately, the enrollment of the cohort of the study was slightly higher than in previous years, which allowed for a relatively large sampling. To protect the identity of the participants, while still allowing robust data, a target of 25-50% of the cohort was set. Following ethical approval from the University of Calgary, CNA, and Memorial University (required due to the partnership between CNA and Memorial University), student participants were invited to participate through an approved recruitment letter (Appendix 3) sent to their CNA student email through the CNA School of Health Sciences Instructional Coordinator. At this point, I had established a relationship with all potential participants as a former instructor but had removed myself from any continuing oversight role within their educational program to eliminate the risk of coercion.

All participants were invited to participate in the research, and 14 individuals expressed interest. Following an initial meeting, five participants who had expressed interest were deemed ineligible due to a combination of factors including geographic location, ability to complete the interviews on time, and prior health care education. These factors related to an inability to complete the interviews as well as prior health experiences affecting the professional identity. Upon beginning data collection with the remaining nine participants, one individual revealed they had a previously unknown exclusionary criterion (prior health education) at the time of recruitment and initial interview. I excluded the data collected from this participant in the final analysis. Eight of the remaining volunteers (see Table 3.1) completed the interview process.

Table 3.1. *Participant Demographics*

Pseudonym	Practicum Location	Approximate Age	Pending Employment Offer	Previous post-secondary education
Blaine	Rural	20-25	Yes	No
Blake	Rural	20-25	Yes	Yes
Casey	Urban	25-30	Yes	Yes
Daryl	Rural	20-25	Yes	No
Hunter	Rural	20-25	Yes	Yes
Jamie	Urban	20-25	Yes	No
Jess	Urban	25-30	Yes	Yes
Kelly	Rural	25-30	Yes	Yes

The research included no limitation on age, gender, ethnicity, religion, or social class, and all students within the cohort were invited to participate. Due to the relatively homogeneous nature of CNA MLT students, specific demographic data were excluded from the final analysis and were divided into simple binaries, as there were significant concerns regarding the anonymity of participants. Notably, any specific reference to age, gender, or ethnicity would have potentially compromised participant anonymity, and while this limited a valuable lens of the research, particularly for gender, it was necessary. I assigned gender-neutral pseudonyms to each participant as the ratio of males to females within the cohort was severely skewed which created concern regarding the identification of participants.

While I intentionally omitted demographic indicators of the participants due to the risk of identification resultant from the small class size, participants were consistent with the predicted demographic profile of the laboratory profession in NL; predominantly female, Caucasian, within an approximate age range between 20-30 years (at career entry), and permanent or long-term residents of NL. During the practicum, participants were evenly distributed throughout NL and had completed their clinical practicum in either a rural or urban laboratory environment. At the time of post-practicum interview completion, all participants had obtained employment offers to work as MLTs pending completion of their national certification examination

Participants' MLT Program

The CNA MLT program is a three-year diploma program consisting of classroom training, simulated clinical laboratory, and applied clinical practicum training. The program is 10 semesters in length and typically follows a Fall, Winter, and Spring semester format with breaks throughout the summer months. Semester seven is a two-week summer semester focusing on the pre-analysis and collection of human specimens. The program has a first qualified, first admitted

admission criteria wherein students must meet standards of admission to the School of Health Sciences. These include secondary school courses in biology and chemistry as well as mathematics and English components.

For the participants of the study, the first year of the program followed an academic format where students completed foundational learning in maths, sciences (i.e., biology, chemistry, and physics), and communications. At this stage, their instructors were not medical laboratory practitioners but academic instructors with training and qualifications similar to those of secondary teachers in NL. In the second year of the program, students were introduced to the medical laboratory disciplines (clinical biochemistry, histotechnology, hematology, microbiology, and transfusion science) by certified MLTs who hold instructional roles. Notably, minimum faculty qualifications at CNA typically do not require graduate-level qualifications. Students complete significant foundational classroom and laboratory training in year two, along with a short pre-analytical practicum component (two-week semester) at the end of their second year. The pre-analytical practicum consisted of rotation through a clinical site to perform phlebotomy and receive an introduction to clinical practice related to the collection, preparation, and accessioning of human specimens.

During the third year of the program, participants were exposed to simulated clinical laboratory environments at CNA for three weeks in each of the primary disciplines (15 weeks total) and continued their learning in clinical laboratory procedures. These procedures are mostly “analytical” in nature and consist of the direct analysis of human specimens to produce results used in clinical diagnostics. In the second (Winter) semester of year three, students must complete a 15-week clinical practicum session involving significant training in the analytical aspects of the profession and the attainment of clinical competency. This practicum typically

consists of a three-week rotation with preceptor technologists in each of the five primary disciplines at a clinical site(s). The practicum constitutes the first robust exposure to the clinical laboratory environment and a point in which students are assessed by preceptors and future peers in the field, as opposed to their instructors. It is this learning intervention of which this study is primarily concerned.

Thus, the research is bound to this MLT program and the clinical experiences of the students in this cohort. The 15-week clinical semester of the program served as the primary learning intervention and explored the impact of this intervention on the participants' identity. Students are fully immersed within the practice of medical laboratory science and partnered with clinical preceptors who guide their learning using the reference materials (i.e., clinical practicum guidance documents) provided by CNA. All participants completed a relatively even amount of time in each of the five primary disciplines.

Data Collection

Yin (2009) identifies several sources of evidence commonly used in a case study that includes documentation, archival records, interview, direct observations, participant observations, and physical artifacts. Of particular interest to this study is the interview, which serves as a valuable form of data collection within case study research to capture participants' thinking of their experiences. Interviewing marks a move away from seeing human subjects and data as somehow external to individuals towards regarding knowledge as generated by humans through conversations (Cohen, Manion, & Morrison, 2011). The interview is a purposefully driven, constructed, and planned event rather than naturally occurring conversations and is constructed in such a way to establish a purpose, which is variable and may include the evaluation or assessment of a person in some respect, to gather data, or to sample a respondents'

opinions (Cohen, Manion, & Morrison, 2011). As such, interviews can take on varying forms, which may include informal conversational interviews, semi-structured, guided approach, open-ended interviews, or closed quantitative interviews.

Within this study, the primary tool utilized was a semi-structured interview, conducted at two points in time with a level of overlap in the question structure. The choice of the interview over other methods was purposeful and well-aligned with exploring the identity at two points in time from the perspective of the participants. Interviews allow for the in-depth exploration of views, experiences, behaviours, motivations, and ideas of individuals on specific matters. Moreover, semi-structured interviews help explore key ideas but also allow the researcher or participant to pursue an idea or response in more detail as the conversation shifts.

Instrument Development

As there was no instrument readily available, it was helpful to review key documents from the MLP program to aid the development of an interview protocol. I reviewed specific MLP education program documentation to explore the discourse of practice MLP students at CNA encounter through their curriculum. This documentation included the CSMLS competency profile, which shapes all MLP educational programs in Canada; the CNA MLT competency manual, which serves to standardize the clinical practicum experience across the province; the CSMLS code of professional conduct which sets specific values of which all MLPs must adhere; and the NLCHP guidelines which offer clear definitions around what constitutes expectations of health professionals in NL, as the NLCHP serves as the regulatory authority in NL.

NVIVO 12 was used to conduct a textual word frequency search in which stemmed words were grouped into categories to explore. Two primary categories regarding the conceptualization of the ideal MLP emerged with several subcategories under each. These

included most notably an overarching conceptualization of professional to include internalized aspects of responsibility (i.e., accountability, competency, legality, adherence to requirements and integrity), and the concept of ascribed attributes to health care practice (i.e., health care as a team-based exercise which necessitates continuous learning, communication, professionalism, and public awareness). Aspects of responsibility associated with the profession were apparent within the documentation. Figure 3.1 highlights the results of word frequency analysis conducted using NVIVO 12.



Figure 3.1. MLP documentation word cloud

Outside the context of competency attainment, which makes up most of the content within the CSMLS competency profile as well as the CNA practicum manual, there appeared to a primary focus on the concept of accountability in performance as a form of personal responsibility or compliance with accepted or appropriate, standards, protocols, procedures, and principles. Considering the ramifications of the Cameron Inquiry (Cameron, 2009)—a judicial inquiry into breast cancer screening errors in NL—as well as the ongoing regulatory trends in Canada related to health care professional accountability, this is neither surprising nor unexpected. Keywords isolated within the documentation included adherence, attendance,

competence, acceptance, following, and standards, each implying a professional responsibility of which MLPs are expected to adhere. Examples of this approach include the following statements found within the code of conduct as well as the CSMLS competency profile:

Medical laboratory professionals shall take responsibility for their professional acts.

(CSMLS, 2015)

Complies with legislation that governs medical laboratory technology. (CSMLS 2015)

Furthermore, contained within the documentation was a significant focus on the concept of public accountability and an underlying theme of compliance with established standards as the responsibility of the MLP to ensure public safety. While aspects of responsibility were well represented within the textual data, it was indicated that active acceptance of several standards prescribed through the CSMLS and competency profile is expected. These standards included a specific focus on teamwork, public accountability, and established professional standards like socially acceptable attire and professional behaviours as well as an expectation that MLPs support their profession and engage in continuous learning. Examples of this include the following statements:

The medical laboratory technologist conducts their professional practice according to established protocols, safety guidelines, and existing legislation. (CSMLS, 2015)

The medical laboratory technologist meets the legal and ethical requirements of practice and protects the patient's right to a reasonable standard of care. Professional responsibility encompasses scope of practice, accountability, and professional development. (CSMLS, 2015)

Fundamentally, the document data was prescriptive of behaviours and attitudes expected of entry-level practitioners. These behaviours and attitudes were an important connection to

Illeris' (2014b) personality layer (see Figure 1.1). The code of professional conduct, for example, sets specific standards of which MLPs are to adhere. I embedded these specific characteristics in both the pre- and post-practicum interview questions. It was, for example, necessary to explore if and how students took up this notion of responsibility and accountability given it was ubiquitous within the documentation. During the interviews, I probed this with specific reference to tasks that students felt were important as well as a conceptualization of how they felt MLPs fit within the patient care circle. While it was essential not to disregard the discourse in which the students' professional identity was developing, I was primarily concerned with professional identity development as experienced by the individuals within the case, thus focus on lived experiences was of specific value. Moreover, I considered Illeris' (2014b) layered conceptualization of identity (see Figure 1.1.) as well as the broader understanding of adult learning as a holistic endeavour by constructing questions that explored several important ideas in the interview protocol. These ideas included participants' self-perceptions, perceptions of others, and in exploring transformative learning, a specific focus on their experiences in the post-practicum interview. In each case, I developed semi-structured interview questions relative to the guiding research questions and the primary categories of MLP student professional conceptualizations, perceptions of the profession, experiences as informing the development of professional identity, and how student learning impacted their professional identity development.

Though there was some intentional overlap within the questions across the pre- and post-practicum, each of the two interviews with each participant served a specific purpose and differed accordingly. The first interview was designed with consideration of the guiding research questions, to set the stage of how the student professional identity had begun to develop and to explore their perspectives from within the didactic aspects of their initial training. The second

interview aligned more closely with exploring and documenting the students' experiences and how these experiences served to shape their identity and their perceptions of the medical laboratory field, while also serving as a reaffirmation or refuting of perspectives obtained within the initial interview.

Conducting the Interviews

Interviews were conducted face-to-face at a CNA campus and over the telephone due to geographic limitations. Pre-practicum interviews occurred within the first two weeks of the students commencing their clinical practicum. While I had intended to conduct these first interviews before students had begun the clinical practicum, this was delayed slightly due to late ethics approval. Though this was not ideal, I felt the students' limited experiences would not have likely altered the findings significantly. The second set of interviews occurred immediately following the completion of the full 15-week clinical semester.

During the pre-practicum interview, participants were located throughout NL and had completed only a short period in various clinical laboratories. Post-practicum interviews were exclusively conducted face-to-face at a CNA campus. I provided each participant with the opportunity to meet at an alternate location; however, they each chose to complete the interview at CNA as they were frequently on campus. At the time of the post-practicum interview, all students had completed their clinical practicum and were in preparation for their national certification examinations before entering practice as MLTs.

All participants had exhibited comfort and familiarity with me and my role as a researcher. This level of comfort not only allowed for meaningful dialogue and an openness to share their experiences but also an ability to engage in natural and unrestricted conversation. The relationship between myself and the participants is a noteworthy consideration, and each

interview was cordial and, in all probability, influenced by my role up to that point in the program as both instructor and advisor. CNAs small campus, small cohort, and repeated instruction allow for the formation of relationships with virtually all students who complete the program.

As the participants were students in the program at the time of data collection, I had removed myself from any oversight of their cohort, which could have created potential ethical conflict as well as to reduce the possibility of scripted answers that students may have felt they should have said and to establish further reliability of the data. This removal of power ensured their volunteer participation, as well as allowed free expression of their perspectives. For the duration of participant involvement, I had transferred all duties related to my oversight of their clinical practicum to another faculty member in the MLT program.

Before each interview, each participant had signed an approved consent form. I began each interview with a brief description of the interview process and asked each participant if they had any questions or concerns before beginning. I reassured each participant that if they felt they did not wish to respond to a question, or if they wished to withdraw at any time, they could do so without any ramifications, questions, or coercion. Moreover, I reminded them that though I remained involved in their program, I had no further impact on their formal evaluation and that the research was being conducted separately from their school. I provided each participant an opportunity to review the interview questions, though most admitted to having given them only a cursory look. As each of the interviews continued, I prompted students to consider sharing stories and experiences as a way of probing deeper into their practicum. I encouraged students to talk about topics of which they were unsure and provided clarification when prompted. Though some participants began the interview with a brief initial apprehension to being recorded, the conversation in each interview was free-flowing, jovial, and meaningful. In each interview, I

took handwritten notes, focusing mainly on expressions and emotions, which were incorporated later using NVIVO 12.

Data Analysis

Yin (2009) suggests that data analysis consists of examining, categorizing, tabulating, testing, or otherwise recombining evidence to address questions or propositions within a study. Data analysis consists of content analysis conducted in a controlled fashion that often incorporates a form of coding. Coding is a significant feature of most qualitative data analysis in which text is given a specific name or label by the researcher (Cohen, Manion, & Morrison, 2011). This coding process enables the researcher to identify similar pieces of information and to search and retrieve in terms of those that bear the same codes. Various forms of coding exist, which include open, analytic, axial, and selective, each of which offers a varying approach to data analysis (Cohen, Manion, & Morrison, 2011). Fundamentally, coding allows for the narrowing of data into select themes through segmentation and labelling text to form descriptions and broad themes in the data, which allows researchers to make sense of textual data and examine for overlapping and redundancy (Creswell, 2012).

Analysis of the interview data for this study followed the approaches described by Thomas (2006) and Creswell (2012), wherein coding of interview data consists of the digitization of files, a close reading of the textual data, and creation and reduction of textual segments into primary themes, and additionally with a comparison of the emerging themes as series in time (Yin, 2016). All interview data were analysed using NVIVO 12 and stored on a secure encrypted data drive. The audio recordings were retained as per the University of Calgary policy. Interview data sets (pre-practicum and post-practicum) were analysed independently, with the first set of interviews being coded and analysed before the second. I transcribed each

interview using NVIVO 12 and in sync with the MP3 files, which allowed for an immersion in the data and to recall the emotion and conversation held between myself and each participant. In transcribing this way, I was able to focus on the nuance, tone, non-verbal cues, and pauses within the data, which I noted in the transcriptions. This process allowed for the generation of preliminary codes during the transcription, particularly when the participants discussed similar experiences.

Following the initial transcription and preliminary coding, several close listening and readings of each interview allowed for open coding of the interview data, wherein the many textual segments related to the guiding questions and the theoretical understanding of identity were segmented from the transcripts (Creswell, 2012). As I had formed a relationship with each participant through my time as their instructor, I was concerned about my feelings influencing my analysis, and it was important for me to review the data multiple times and in multiple ways as a way of establishing further reliability of the process. Thus, I coded the data in two distinct ways.

First, I carefully read and reread each participants' full transcript and coded for broad statements and ideas related to the theoretical framework (i.e., identity, self-perceptions, experiences, and relational attitudes, meanings, and values). Second, I used the interview questions as a guidepost and reorganized the transcripts around the guiding questions, collectively reviewing the data on a question by question basis (i.e., aggregating each participant's response to a specific question). This process was repeated for both the pre-practicum and post-practicum phase independently and took several weeks.

Following this initial coding process, I identified relationships between the codes to develop themes. I further reviewed and refined these themes, eventually grouping them around

three emergent elements, which were informed by the theoretical framework—understanding each element as being primarily located inside the personality layer (Figure 1.1.). Once I had analysed both sets of interview data independently, I conducted a cross-analysis of both pre and post-practicum data to explore both commonalities and differences between the identified themes. Moreover, to explore if there had been any substantial shifts in the themes as a function of time or as a result of the practicum experience. This cross-analysis allowed for visualization of the changes occurring within the participants' MLP identity and allowed me to further reflect on each theme. This reflection resulted in further review and refining of the themes and helped validate the identified themes and the relative grouping within each element.

Ethical Considerations

The research approach carried minimal risk to participants. The researcher's role as both a primary instructor and clinical coordinator within the medical laboratory science program raised ethical considerations about the potential risk of coercion in the recruitment phase of the study. At all stages of the recruitment and data collection phase, participants were made aware that their decision to take part or not, would have no implications on other aspects of the programming through both verbal and written information. While the students remained registered within the medical laboratory science program, the clinical coordinator (my role at the time) of the medical laboratory program serves merely as a point of contact for clinical practicum (hospital) sites, contacted only in exceptional circumstances (i.e., injury, misconduct, illness). For the duration of the study, I relinquished all responsibilities regarding clinical practicum to another faculty member within the program as well as all potential authority over student progression. Moreover, all formal evaluations by the researcher for participants were completed before the recruitment phase to ensure participants did not feel coerced.

As the research involved current CNA students, a secondary ethical review was required and conducted as per CNA policies in conjunction with Memorial University of Newfoundland's Interdisciplinary Committee on Ethics in Human Research (ICEHR). Before data collection, potential participants were encouraged to ask any additional questions surrounding the research they may have had, and I provided an overview of the research before they agreed to participate. I obtained signed informed consent from all participants. In addition to the signed consent, during data collection, I provided participants an overview of the process and how the data would be used and once again advised them of their rights to withdraw from the interview at any time. I further provided current contact information, including telephone and email address, through which participants were able to express their request to withdraw at any time.

A further ethical consideration arose related to the confidentiality of student participants. While I made every effort to protect the identity of the participants, they may have been aware of each other's participation due to the close-knit nature of the program as well as the limited number of participants. It was outside the control of the research if students discussed their participation. All published data utilized an assigned pseudonym system to protect the identity of participants. The audio recording was maintained and stored per the University of Calgary policy and reviewed/heard only by the primary researcher and supervisor as required. Data was transcribed from audio recording to NVIVO files to allow evaluation with NVIVO 12. All raw data files pertaining to the research were organized and maintained on a single secured computer and backed up on a secure encrypted data drive. Upon completion of the research project, all original data was removed from the secure computer leaving only the secure encrypted data drive.

Summary

Using case study methodology, I explored the notion of professional identity formation through the lived experiences of a small community of developing MLP students. This chapter outlined the process I engaged in to achieve the goal of describing the complex nature of this relatively unexplored profession. Analysis of the data was conducted using thematic analysis, and at each phase, I considered the emerging themes in reference to the described theoretical framework. I attended to validity and reliability throughout the research process by maintaining detailed notes and reviewed the themes multiple times to allow for an iterative and reflective process.

In the next chapter, I present the findings resulting from the data analysis in terms of the identified themes within the identified identity elements.

CHAPTER FOUR: FINDINGS

Overview

In this chapter, I present the findings of the data analysis. Though I incorporated select aspects of the individual participants' experiences, central to this inquiry was the broader medical laboratory professional (MLP) professional identity and its development as a process of adult learning, which I understand more particularly as a type of transformative learning. I organize this chapter by presenting data related to participants' developing professional identity collected at two points in their program: before they began their practicum and immediately following its completion. This approach allows for a conceptualization of the changes that occurred among them as a group (see also Figure 1.1). Utilizing Illeris' (2014b, 2014c) model, I view professional identity as one interconnected part-identity amongst many other part-identities, constituted by core, personality, and preference layers, which derive from a myriad of values, attitudes, meanings, and convictions that people use to define themselves within occupational roles. Based on this view, my data analysis resulted in eight primary themes at the pre-practicum stage and 10 primary themes post-practicum, all related to identity.

As I described in Chapter Three, I grouped these themes into three elements of the participants' emergent MLP identity, with each element primarily located inside the personality layer. These elements are: personal and biographical characteristics, relationships between the participants and the social realm, and the engagement with professional norms and rhetoric associated with the discourse of the medical laboratory field. Figure 4.1 is a schematic representation of these elements based on the theoretical framework of the study in Figure 1.1 to conceptualize both the pre and post-practicum identity. In Figure 4.1, the left column represents the layered concept of the professional part-identity present at both the start of the pre-practicum

as the existing personality layer and as it appeared following the practicum experience. The right column represents the emerging elements from within the research.

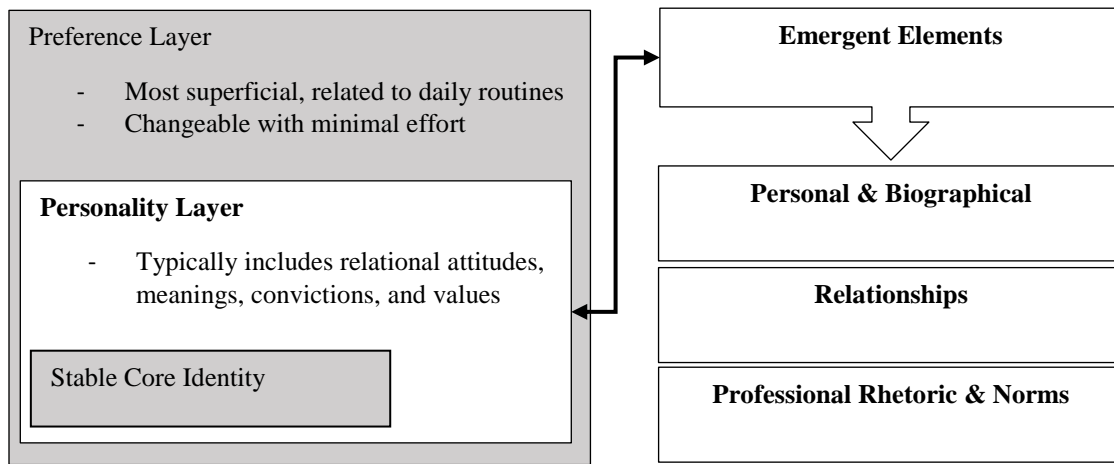


Figure 4.1. Schematic representation of identified elements affecting participants' personality layer (where transformative learning occurs) and development of MLP professional identity

The chapter is organized into three major sections. The first two address the participants' pre-practicum and post-practicum identities, respectively, each of which is organized in terms of the three emergent elements in Figure 4.1 and the themes associated with each element. The third major section deals with disorienting dilemmas during the practicum associated with the change in identity.

Note that since this is a qualitative study, instead of referring to similar findings for a group of participants numerically, I use "most" or "many" to indicate that at least five participants demonstrated a similar way of thinking. In addition, for these situations, instead of providing supporting evidence from the data for each participant, I offer fewer examples (e.g., three from five/many participants) that are representative of their thinking as a group for a particular theme.

Who They Were: Participants' Pre-Practicum Professional Identity

Through my pre-practicum analysis, I produced a description of the participants at the

start of their practicum, understanding that part of their professional identity had begun to form during their time in the program. Throughout the analysis, the convictions participants held, what they valued or were interested in, their reasons for beginning their program, their feelings related to their social perceptions, and their common values regarding the medical laboratory profession emerged as defining aspects of their identity. It was essential to consider these characteristics at this point in their program as the starting point for further transformative change resultant from the clinical practicum experience. Thus, the pre-practicum interview allowed for an establishment of a baseline from which to describe future change resultant from interaction with clinical practice.

While I situate the three identified elements primarily within Illeris' (2014b) personality layer, I do not consider their location completely rigid within this layer, nor within the greater multifarious identity. Aspects of these elements may exist in the transitional spaces between the layers, as noted by Illeris (2014b), and may overlap with the central personal identity. This characteristic is expected due to the interconnected nature of identity, particularly concerning the work identity. For example, aspects such as the personal and biographical characteristics are both located closer to or overlapping with the core identity and occur across multiple part-identities.

Personal and Biographical Factors

In this section, I address the findings of the *personal and biographical factors* (first emergent element, Figure 4.1) influencing the participants' pre-practicum professional identity based on four themes: limited prior knowledge of MLP; personal interest in biology; feelings towards other health care careers (i.e., personal interest and admiration for careers in health care); and connections to their family (i.e., significant familial connections in choosing their field).

Illeris (2014b) considers the central personal identity as the locus of the total identity. As such, at the beginning of the pre-practicum interview, I asked participants to think about their family, childhood memories, and personal links to the profession and to share a story about themselves relating to why they chose to enter the medical laboratory field. This initial question allowed for an understanding of how they had come to engage with the field and what it was about the field that attracted them. Through discussion with the participants, the following commonalities emerged.

Limited prior knowledge of MLP. Through sharing their stories, most participants indicated they did not hold significant prior knowledge of the nature of the work of an MLP. Casey best summarized this theme, stating that, before starting this program, “I never even thought of a lab tech, I had no idea what a lab tech was at all.” Several participants indicated that they had come across the medical laboratory technology (MLT) program by chance while exploring other options through the College of the North Atlantic (CNA) website. Indeed, Blaine, Casey, and Hunter admitted they had only selected the MLT program due to the lengthy waitlist in medical radiography, while Kelly and Blake had also been fielding other educational options but had yet to receive admission.

Participants indicated that the medical laboratory field was in no sense a *calling*. As the following comments illustrate, though most had a surface level knowledge of the field, associating it with taking and analysing blood, working in a lab, and analysing specimens, they were unaware of many aspects of the work:

I knew they took blood, and I knew that they analysed it, but I didn't know about tissues and sputum and CSF [cerebrospinal fluid] and all that stuff. (Hunter)

I just knew that [an MLT] was someone that worked in a lab and analysed all these

specimens and gave results back. (Jamie)

I had a surface understanding of the program at that point, you know, I knew I was dealing with human specimens, but that's pretty much it. (Kelly)

Notably, aspects of this limited awareness are understandable and likely present in many fields. Despite their admissions of limited knowledge of the field, their two years in the program, which included several months of simulated clinical training, had likely informed how they articulated their pre-program understandings.

Personal interest in biology. During the pre-practicum interview, I asked participants to reflect on the beginning of the first year of their program and why they decided to pursue this somewhat unknown field even if encountered by chance. While participants indicated a limited knowledge of the specific work of an MLT before their program, they had associated it with biology and general sciences. As the following comments demonstrate, many of them considered a long-standing interest in biology as influential in pursuing the MLT program:

I knew that I was interested in the sciences, and I knew when I was doing different biology courses, that I was always good at biology. (Blaine)

I was always interested in biology and anatomy, and I guess that's how I kind of got to where I am now. (Jamie)

I love biology and anatomy, and I [asked myself], well, what am I going to do with my life, and what is something I am going to enjoy. (Hunter)

Five of the participants had even engaged in general life sciences courses at other institutions; however, health care is a distinct professional direction for life science, and it was necessary to probe further into why participants had chosen a health care field. Specifically, I asked participants to think about their interest in health care, how they felt about health

professions in general, and whether they had always felt that way.

Personal interest and admiration for careers in health care. In addition to the participants' interests in biology and science, for most of them, there was also a long-standing interest in health care fields. Jess, for example, explained that health care was "just something that I wanted to do as a kid." Moreover, as the following comments illustrate, in talking about health care careers, most participants emphasized an admiration for the people working in these fields as well as an interest to pursue work in health related fields:

I guess I have always just really looked up to people who work in health care professions, whether you are a lab tech, or whether you are a nurse, or whether you are a doctor, or a PCA [personal care attendant] or something like that. I feel like I have just had a lot of respect for all those people. (Jamie)

I mean, it's an area of biology that I have always been interested in any way, the health care side of it. (Kelly)

I was always interested in biology and chemistry, and doctor shows like House was influential (laughter). I wanted to help people in a medical sense. (Casey)

Two of the participants indicated that their admiration for the health care professions was a direct result of their health experiences as children. Hunter and Daryl described their experiences in detail, and each noted a high level of admiration for the many health professionals they encountered during their illnesses. They indicated it was a primary motivator in their choice to enter the health care field.

While many participants shared similar stories relating to their ideas of health care professionals, additional factors had influenced their interest and admiration towards health care careers. On several occasions, participants noted employment and the perceived stability they felt

health care careers offer. Hunter, for example, had considered pursuing study outside health care but concluded against this due to employment perceptions stating, “well, a lot of people who graduate with diplomas or degrees in arts are jobless.” As these other comments illustrate, this was a shared view:

I have always wanted to work in health care. It’s also a stable job cause people always need health care. (Casey)

I love biology and anatomy, and I was like, well, what am I going to do with my life?

And this is something I am going to enjoy, and I wanted to do something that I am going to get a job in. (Jamie)

The idea of jobs, you know, health care is something that's always growing as a field.

You are never gonna have a shortage of [illness]. I don't know how to word it, but health care is something that's going to always be there. (Kelly)

In considering these sorts of comments, I find it valuable to think about the significance of the work identity. Illeris (2014b) makes it clear that work identity is a vital part-identity for any individual, with young people often being in a state of change relating to their work identity. In their comments, participants placed substantial emphasis on stable employment. It is possible that in coming to these perceptions of health care careers as stable, participants juxtaposed their sense of opportunity in the MLT field with experiences with previous transient employment typical amongst CNA students.

Significant familial connections in choosing their field. Connecting with this idea of stability and by extension career, each participant indicated familial influences as having affected their interest in pursuing health care careers. This influence closely aligned with the participants’ ideas related to nursing, and references to nursing and the nursing profession were frequent. In

several instances, I prompted participants to consider the MLP in contrast to nursing. The ubiquity of the nursing profession and the high number of nursing professionals in health care had affected the participants' lives in various ways. For example, four participants identified that a parent—most often, a mother—was a nurse. Most participants, including all those whose parent was a nurse, indicated having considered a nursing career, in part through familial pressure. It is possible that the participants chose MLP due in part to their described preconceptions of the nursing profession and active choice not to enter the nursing field.

Despite the familial pressures, the participants did not feel that nursing was the right fit for them, but still pursued a somewhat similar field. It appeared that preconceptions regarding the caring nature of the nursing profession were a central point of contention for many of the participants. As the following comments illustrate, their choice to enter the medical laboratory field was strongly influenced through this active choice *not* to enter nursing and influenced by their ideas about nursing along with the applied familial pressures:

You know, everybody told me to do nursing, and I was like, that's not really related to what I was doing, that's not really what I am passionate about, what I like. (Kelly)

My parents said that you are wasting your time [regarding MLT]. Why are you doing that? You should go back and do nursing. They would say, what are you doing? Why are you wasting three years of your life? (Casey)

My nan was a nurse on my mom's side. She always wanted me to be a nurse, but I don't want to do nursing because I am not that compassionate, I am not. I am an honest straight-up person, and I suck at feelings and stuff. (Jamie).

Not only had the participants' preconceptions of nursing impacted their choice to counter many of the familial recommendations and pressure, but they had also chosen to enter an

alternate health care field. It remains unclear whether the choice to enter an alternate health care field was a form of “middle ground” in response to familial pressure; however, as the next section details, how the participants felt others perceived them, specifically their family and peers, was an important consideration for them.

Relationships

In this section, I present the findings of the *relationships* (second emergent element, Figure 4.1) affecting the participants’ pre-practicum professional identity based on two themes: the perception of meaningfulness of being an MLP (i.e., perceptions relating to importance, visibility, and understanding) and perception of MLP versus nursing (i.e., perception of MLP as distinct from nursing).

Professions are socially constructed, and existing social relationships are, therefore, crucial in the development of professional identity. A central aspect of Illeris’ (2014a, 2014b, 2014c) personality layer is how one relates to others. According to Illeris (2014a),

the personality layer is, in contrast to the core, not so much about the relationship with oneself but rather about how one relates to others, communities and groups, important issues and instances, significant events, and incidents — overall to the outside world, society, and environment of which one is a part. (p. 156)

This statement brings to the forefront the importance of various relationships to the development of identity. The participants had begun to establish perspectives and predictions relating to their future relationships with others, and several themes emerged. Of particular note, many of these relational factors were those that had formed up until the beginning of the clinical practicum, and no doubt, the participants’ time in their program had been an influence.

Perceptions relating to importance, visibility, and understanding. This first theme

highlights the participants' pre-practicum professional identity regarding their perception of the meaningfulness of being an MLP. As participants had spent approximately two to three years within their program, their initially limited understandings of the field (before beginning their program) had altered to incorporate the learning that had occurred; however, participants had also begun to form predictions about relationships with MLP peers, other health professionals, and the general public. The impact of these predicted relationships emerged in several ways, most notably how participants felt that outsiders perceived them. Perception is an aspect of Illeris' (2014b) personality layer, roughly corresponding with Erikson's (1968) concept of the ego-identity, which Erikson sees as influenced by relationships with the outside world and at this point, I am also reminded of Jubas' (2013) metaphor of the translucent crystal, in which the facet of the crystal may be turned to allow the observation of the individual. To explore this idea, I asked participants to think about the importance of their role, how they felt others saw them, how they wished others would see them, and how they would describe their chosen field to a stranger.

Despite having minimal patient contact and having been educated mainly in the classroom, all participants felt their service and the services of MLPs were important. Four participants indicated a belief that the MLP was essential to saving patients' lives. Blaine described this sense of importance in this way: "I know what I do, and at the end of the day, I know that I help in a significant way to help save that patient's life, and to me, that's all that matters." As the following comments illustrate, participants had formed expectations of the value of the work, and I encountered this "lifesaving" sentiment on several occasions:

Depends on where you are, I mean, if you are going to be in blood bank, then you know you are going to be saving lives, or potentially, it could be a bad connotation, you could be killing people, I suppose. (Casey)

What is the most important thing I will do? Save lives. (Daryl)

It means that I have, sounds kind of cheesy, but a purpose. You know, it means that I kind of know I am important in a sense, to myself. You know that I have a role to play in somebody's life. (Kelly)

The participants held strongly positive feelings towards the field and a sense of importance regarding their future careers; however, most of the participants indicated the medical laboratory field and, by extension, the MLT, was misunderstood and, in some cases, unrecognized and imperceptible. As illustrated by the following comments, when asked how they felt patients perceived them, participants' responses were generally negative:

It would be really good if people could know that we are part of [health care] because most of the time, we stay in the lab, and most people don't know what we do. (Blaine)

I think that [MLPs] are probably not perceived by patients. Honestly. Cause [MLTs] don't ever get seen, well, except for like MLAs. (Casey)

I just wish that [outsiders] would know more about what we did so that they could look at us, I guess kind of like nurses and doctors. (Hunter)

No one knows what we do, we are just invisible, no one even knows we exist, but we actually do so much. (Daryl)

I wish people understood what it means to be a lab tech, like what they do and how much work it takes and how specific everything is and how critical everything is. (Jamie)

Previous research by Grant (2005b) and Butina (2010) support these ideas of limited visibility as being important. In line with this notion of limited understanding and visibility, I further asked participants to detail how they would describe their profession to a stranger to unveil how they wished to be perceived. In most cases, the participants' descriptions to a

stranger were somewhat vague, but all participants noted a desire for increased awareness and understanding of their field. Two participants referred to nursing, indicating they wished for parity with nursing in the eyes of others. This reference to nursing was the first inclination towards an additional theme related to nursing, which I discuss in the next section. Notably, both Hunter and Kelly's response to this question proved insightful:

I would just like [the public] to know more about what we do so that they can have more respect or something towards us. People look at nurses, and they have all this respect, and they are like, thank you for doing the job that you do. But no one ever says that to lab techs, because no one knows what we do, and they barely even know we exist. (Hunter)

[I would like to be seen] just as important as a nurse. You know we do so much, and nurses are undervalued too, but they still are recognized. Do you know what I mean?

Yeah, just recognized, understood. (Kelly)

It was also evident in the interviews that the participants felt the medical laboratory profession, and by extension, they themselves were hidden from the public, contributing to a limited understanding and relationship with which the participants were struggling. Several participants attempted to explain the reason for this perceived limited visibility. As the following comments indicate explanations related both to the physical location of the laboratories and portrayals in popular culture:

We usually work in the basement (laughter) of the hospital, and we are kind of just forgotten about, like, shoved to the corner a little bit. (Kelly)

I don't think patients ever think about us, so like a patient, they don't even realize we are there. (Jess)

You see all these commercials on TV, for example, about RNs [registered nurses]. Oh,

we need more RNs because they save lives, and they do this, and they do that. But what do you see about us? About MLPs? You don't see anything; you don't even know we exist really. (Blaine)

Connecting with this idea of comparison with nursing, the participants had also begun to adopt a hierarchical view of health care, including the medical laboratory field itself. Most participants attributed value in the terminology used by others to describe them and struggled with aspects of institutional labelling related to terminology. To explore this further, I asked a pointed question relating to the term, technician, as MLTs in Canada are often referred to as technicians, particularly amongst non-MLPs, but the correct term is technologist.

Most participants considered the terminology problematic. According to Blaine, “There is such a thing as a laboratory technician, but that's not what I do. So, a lot of people don't know that there even is a difference, so it makes you feel as if you are almost downgraded.” Others displayed more confusion around what that difference in terminology represented and even demonstrated a limited understanding of themselves surrounding the nuanced differences that exist on a scope of practice level:

Not a technician! Wrong! Incorrect! (Laughter). Actually, my nan, people ask her what her grandkids are doing, and she tells them that I am a laboratory technician. She told me that, and I (laughter), I got so mad at her, I was like, I am not a technician. (Hunter)

We are technologists, and I think that word, just kind of sounds a bit more powerful. We are med lab technologists, so we are people who work with medicine, but we are on the technology end, we are on the statistics end, we are data collectors. (Blake)

To me, a technician is less than a technologist. Like I know, no matter what level you are on, everybody works together, like nobody is less than anybody, but like technician is

less; not less qualifications per se, but they are not allowed to do as much as a laboratory technologist. (Daryl)

I don't even know if I understand really what the major difference is because I joined this program cause this is lab technologist, but I always correct people if they say technician.

I am like no, I am a technologist. (Jamie)

Perception of MLP as distinct from nursing. This second theme regarding relationships consists of the participants' perceptions of MLP versus nursing. Throughout the research, I frequently encountered comparisons with nursing, which remained a focal point throughout the work. As previously indicated, participants did not consider MLPs as caregivers (see previous section relating to choosing MLP over nursing) but had also established a view that the medical laboratory field was less understood and less respected than nursing. Moreover, at this point, the participants had come to perceive a social hierarchy. Casey explained, "I feel it's not respected as much. I wouldn't think that [the public], this is just my perception of what [the public] perception is, but I would think that they would think [MLP] are kind of a rung below." This sentiment was evident amongst the participants, and as the following comments indicate, it was complemented with a level of contempt related to these perceptions:

You don't get the praise that anybody else would, like a nurse would get or a doctor would get or anyone like that. (Blaine)

Nursing, I mean, when you see, this is kind of unrealistic, but if you see shows and stuff, you know nurses are there, doctors are there, like that's it. (Kelly)

If you say that you are going to do nursing, everyone knows what a nurse kind of does, like if you ever step foot in a hospital you know, kind of where nurses are and what they are doing, but no one ever sees lab techs, they don't know they [MLPs] exist really.

(Jamie)

At this point, the participants had limited interactions with nursing from a coworker standpoint, and many of these perceptions related to preconceived ideas surrounding their would-be professional relationships. I explore the implications of this further in Chapter Five.

It is worth noting again the active choice not to complete nursing programs. Five participants indicated not wanting to complete a nursing program, due in part to their pre-existing ideas of care roles but also feeling as though the role of MLP was distinct from a direct care provider. Blake described the medical laboratory profession as one that was suited to those less interested in working with the public, stating, “If you want to get into the medical field, but you don't really understand how comfortable you are around people. Or, how you might feel about doing this work with technology and stuff, I think this is a good stepping stone.” Several participants shared this idea, indicating that the caring or emotional role of nursing was not right for them and that the MLP was better suited to them. Kelly and Jamie, for example, made clear distinctions about their choice not to enter the nursing field:

Everyone is, like, you don't have patient-to-patient interaction very often, you don't have to really be like compassionate and stuff as much. (Jamie)

I think nursing is just like such an amazing job, but it's just not for me. (Kelly)

Professional Rhetoric and Norms

In this section, I address the findings of the participants' engagement with *professional rhetoric and norms* (third emergent element, Figure 4.1) in relation to their pre-practicum professional identity based on two themes: attitudes, convictions, and values regarding the ideal MLP identity; and views on their learning.

In addition to the relationships that individuals had begun to engage or perceive, the participants had also started to engage with the professional rhetoric and norms associated with the field. This links to the development of shared convictions, attitudes, meanings, and values that develop in relation to group affiliations within the personality layer (Illeris, 2014b). As the participants were students in the program, it was logical to assume that exposure to the professional discourse would inform their professional identity. As the following sections note, while the participants held personal views relating to their identification with the field, shared views regarding what attributes they felt were necessary emerged.

Attitudes, convictions, and values regarding the ideal MLP identity. This theme deals with the participants' perspectives of an ideal MLP identity based on the shared attitudes, convictions, and values they developed about it.

While many themes referred to the personal aspects of the individual as well as their social relationships with others, also evident was the participants' development of an idealized identity. Ibarra (1999) indicates that individuals adjust and adapt their professional identity during periods of career transition. Individuals may or may not engage with the shared values, behaviours, attitudes, convictions, and ideas within a profession. For context, I characterize the concept of the ideal identity as those behaviours, attitudes, convictions, and ideas which are authorized by the social body as those which are appropriate, required, or necessary. Illeris (2014b) also notes that within the personality layer of identity are many components, including but not limited to relational attitudes, meanings, convictions, and values.

To explore this idea, I asked participants about the beliefs, values, and ideas they had encountered, and what they felt constituted "good" or "bad" characteristics of the ideal MLP. Several consistent themes emerged around these questions. Due to the highly technical nature of

the work and significance of errors, appropriate skills associated with task completion were considered particularly positive. Blaine, for example, stated, “You definitely have to be organized and know how to multitask.” I noted this sentiment in all participants who reiterated the idea of the attention to detail or the need to have superior work output. The following comments demonstrate this trend:

[A good MLP has] attention to detail for sure. (Jess)

Making sure that things are done accurately and precisely while also maintaining a safe work environment for themselves and their coworkers. (Daryl)

[A good MLP is] meticulous, competent. I don't know. It's hard to pin it down. (Casey)

Participants also considered feelings of importance or caring about the work within the field as a particularly positive characteristic. Jamie for instance, displayed some concern when discussing the idea of detachment from the patient considering a positive attitude as “someone who actually cares and is concerned with what's going on, like I know people say that you gotta kind of drown everything out in a way, like pretend that the patients are just numbers kind of thing because that's how people see it.” Other participants reiterated this idea of caring in a somewhat indirect fashion:

Someone who cares about patient care, patient's health. Just in general, somebody who can work alongside others but can work independently to make sure that other people are okay. (Daryl)

Somebody who takes their job seriously, you know we are treating specimens that may or may not be extremely hard to collect for people, treating that professionally, respectfully, you know. I mean just being respectful, being mindful, paying close attention to details, cause that's you know a big part of our job too. (Kelly)

All participants were more vocal in identifying what they considered detrimental rather than positive characteristics, implying observation of behaviours that they deemed less than appropriate. In this regard, I was reminded of the concept of negative bias wherein individuals may be more likely to take note of negative social interactions as opposed to those considered positive. Jess summarized this less-than-ideal conceptualization of a bad MLP as “someone who is sloppy! I mean some people you come across, and they are kind of like a little abrasive and a bit, for lack of a better word sloppy.” The following comments illustrate how this lack of attention was noted by other participants who seemed to focus on the consequences of errors:

Somebody who makes a mistake, doesn't understand why they made the mistake, does it again, gets a different result because they did it right, but they don't understand why they did it wrong. (Blake)

I guess someone who doesn't follow correct procedures, doesn't want to tell people about what they do. (Kelly)

Like the amount of people who don't wear gloves, especially in microbiology, when handling things like *C.diff* and then going out and collecting blood, it makes me cringe on the inside. (Daryl)

The participants emphasized several negative characteristics as being particularly problematic. These perceptions were informed by experiences and events that they had observed, though it was unclear if this was a result of their classroom training or their early time in the clinical practicum. Casey, for example, emphasized laziness as being particularly problematic, describing a bad MLP as, “Someone who is lazy and has a bad attitude. I don't know, just not a team player.” Others focused on safe work and what they perceived as poor motivation towards the work:

People who don't take safety nor their patients into consideration. Who are there just because they need a paycheque at the end of the day and that's all that matters. (Daryl)

Well, people who are just there for their paycheque like they don't care, and they would rather be somewhere else. (Hunter)

Someone who is lazy and has a bad attitude. And just not a team player. (Casey)

Fitting themselves within the ideal. Following their discussion of the good and bad behaviours, I asked each participant how they believed they would fall within the ideal identity. Essentially, what would make them a “good” MLP? Most participants struggled with identifying key factors or attributes of themselves and were uncomfortable with a significant amount of self-praise. Yet, most seemed to focus on occupational and attitudinal values, including accountability, responsibility, accuracy, high work output, and their innate interest. Daryl, for example, stated, “I think I will be a good MLP because I work hard, I don't stop, not in the sense that I exhaust myself out, but I want to see that a job is done, I want to make sure that a job is done directly, I want to make sure that things are done correctly.” As the following comments illustrate, others tended to focus on occupational values and more abstract concepts, including their innate interest in the field:

I have attention to detail for sure, and I don't know, I want to make sure that the results are right and that patients get the proper care. (Jess)

[I have] compassion and competence, [I am] not afraid to admit when I am wrong and know where to find the answer. (Casey)

I guess just because I am so interested in it. And I actually enjoy it so like you just take the time to actually do the work well and, I don't know, I just really enjoy the job.

(Hunter)

I have to be sharp. I have to be on time. I have to watch. And you know, you can't resist change, you gotta go with it. You gotta go to the places and just see it evolve, you know grow with it, and I think that might be, I would say that's probably, you know the biggest string to my bow. (Blake)

Views on their learning. While participants struggled with identifying self-characteristics related to their growing role, participants felt the stress of the program had affected them meaningfully. Most participants stated they had experienced some form of positive change since beginning their program. While some of these changes relate to the personal and biographical elements of their identity, there was a significant commonality in their perceptions.

Almost all participants reflected on the academic challenges they had faced within their program, specifically their second year. It appears this had translated to a significant increase in a personal sense of direction and confidence for them as a group. Most participants felt accomplished by their success. Specifically, participants detailed the consequences of failure, which, as the following comments illustrate, had been a preoccupation for them:

Second year was super stressful because there [are] so many courses and so many exams, and it was all really hard, and it came like all really fast. So, it got super stressful. So, for a while, I was like, oh my god, I am never going to be able to do this, and you hear about people who fail, and they were really smart, and they failed anyway. (Hunter)

You are going to fail if you don't put in the time and the effort to be in this program, so if it's not something that you love, you are not gonna do it. (Jamie)

Second-year cuts off many people, and it stresses everybody out, and you know stress is fine in doses, but I mean if we could change that second year in terms of workloads, to kind of stretch over a longer period to time, that would be beneficial I feel. (Kelly)

The concept of failure of others seemed to impact the participants as they had each seen many of their peers be unsuccessful in their program. While it was evident in the interviews that the rigorous nature of the program had affected the participants, the following comments indicate that this same difficulty may have contributed to a mostly positive sense of success:

[I feel] a bit more confident in myself because I am succeeding in what I am doing as opposed to [what I was doing before] I didn't really succeed at it, so I am a bit more confident in myself, I feel happier with myself. (Jess)

I am more confident to do things on my own. I feel more independent now. I am comfortable in the skills that I do have. I am more comfortable in the skills that I don't have. (Daryl)

I feel like I completely changed. My stress went down, I had a better outlook on things, and I don't know. That was definitely the program because it gave you a totally different perspective on how to handle life. (Blaine)

Finally, most participants indicated they felt they had made the correct choice in entering the field. When questioned about if they felt as though they belonged to the profession, all participants indicated a sense of personal belonging with six identifying strongly with this. Casey best exemplified this shared sentiment stating, "100%, I just, I really enjoy it, I feel like I have found a niche, it's like one of those things where it's just like, you, you know?"

Summary of Pre-Practicum Professional Identity

Table 4.1 provides a summary of the emergent themes within the pre-practicum interviews. The participants fit a general description of individuals who had entered the field through a mixture of personal and biographical histories, though with some shared experiences. Their relationships with others, both actual and perceived, had been mainly informed through

their expectations surrounding the field and through their time in the program. While participants felt a sense of belonging to the field, and a degree of accomplishment at this stage, they also had ideas about what their work would be, and how they would engage with the field. Indeed, the participants were ambiguous about their sense of professional identity, which is both understandable and expected at this early stage of their careers.

In many ways, it appeared as though the participants' identity as a student (another part-identity discussed by Illeris (2014b)) was influencing many of their ideas and preconceptions. They had, for example developed certain expectations surrounding the rhetoric of the field as well as their conceptualization of the ideal identity. No doubt, this aligned with their expectations in the classroom and through their experiences with their peers.

Table 4.1

Summary of Pre-Practicum Professional Identity

Identity Element	Emergent Theme	Summary
Personal & Biographical Factors	Limited prior knowledge of MLP	Participants acknowledge having known little of the field upon entry. Participants did not see the field as a calling.
	Personal interest in biology	Participants identified a long-standing personal interest in life science had influenced their choice to enter the field.
	Personal interest and admiration for careers in health care	Participants held an interest in health care fields and perceived them as pragmatic and valuable. Participants were significantly motivated by the employment perceptions of the field.

	Significant familial connections in choosing their field	<p>Familial connections related to nursing impacted their views and decisions to enter the field.</p> <p>Through their families, participants had established preconceptions surrounding nursing.</p>
Relationships	Perceptions relating to importance, visibility, and understanding	<p>Participants felt that they were important but misunderstood and less visible to the public than other professions.</p> <p>Participants perceived a hierarchy within health care perceived MLP as less than nursing in the eyes of others.</p> <p>Participants felt the terminology technician was problematic.</p>
	Perception as MLP as distinct from nursing	Participants demonstrated conflicting emotions related to the nursing profession and their visibility.
Professional Rhetoric and Norms.	Attitudes, convictions, and values regarding the ideal MLP	<p>Participants held consistent beliefs about the importance of their role.</p> <p>Participants had formed ideas of what characteristics were considered positive (ideal) and negative.</p>
	Views on their learning	<p>Participants felt the stress of the program had impacted them and believed their first academic year of the program was disappointing</p> <p>Participants felt confident in their choice as a result of their classroom learning and indicated a sense of belonging.</p>

These themes allowed for the establishment of a baseline picture of the participants. As the next section demonstrates, many of these preconceptions underwent a significant shift during

their clinical practicum. During this time, the students refined many of their ideas and had begun to flesh out both their relationships with the field and their understanding of the profession.

Who They Became: Participants' Post-Practicum Professional Identity

Through my post-practicum analysis, once again, I produced a description of the participants at a particular moment in time. As was the case with the pre-practicum data, I focused my analysis of participants' post-practicum identity on the emerging characteristics of self. During this analysis, 10 themes emerged, and I organized the themes within the same three elements of identity utilized during the pre-practicum analysis (see also Figure 4.1). Organizing the themes in this way allowed for a comparative picture of the participants' identity to be drawn and provided an opportunity to evaluate their identity as a function of time. Moreover, it allowed for a focus on the specific events and experiences which significantly affected their professional identity. Informing much of the participants, pre-practicum identity was their preconceptions or expectations surrounding the field. The post-practicum interviews specifically focused on the experiences of the participants. As such, an element and critical point of transformative learning emerged—the disorienting dilemma. In the following sections, I first discuss the three elements of identity described in the pre-practicum, followed by a description of the main categories of experiences the participants identified as the most significant.

Personal and Biographical Factors

In this section, I present the findings of the *personal and biographical factors* (first emergent element, Figure 4.1) influencing the participants' post-practicum professional identity based on three themes: clarity, confidence, and maturity about career choice; personal responsibility and empathy; and professional detachment from patients.

While the pre-practicum interviews centred on the interests and characteristics of the participants, affecting their choice to enter the field, within the post-practicum data, the themes were primarily experience oriented. Throughout the post-practicum interviews, I asked participants to reflect on these experiences and share stories from the clinical practicum. Through these reflections, several personal and emotional aspects of the work emerged.

Clarity, confidence, and maturity about career choice. This theme addresses the participants' growing clarity, confidence, and maturity about their career choice as MLPs. Confidence emerged as a significant theme within the interviews, and unsurprisingly, technical competence and confidence in their skills had increased tremendously. This increase in skill is an expected result of their program as attaining competence is a requirement to practice. From my experiences as a program instructor in the medical laboratory sciences program, few students who have progressed to the final year of study in the CNA MLT program fail to meet these milestones. Furthermore, referring to their technical ability, each participant indicated that their clinical practicum experience had been considerably positive, and all participants felt they had acquired the necessary skills to practice.

More importantly, all participants expressed a significant shift in confidence relating to their choice and personal suitability to enter the profession. This sense of suitability was prominent through discussion and incorporated elements of role solidification, reflection, and a sense of personal belonging. Casey, for example, stated, "I feel more confident in my choice. I thought maybe that this might be a stepping-stone. But now, I feel like this could be my career for my life." The following comments illustrate that many participants shared this sentiment:

This is what I want to do, you know, especially going through the lab and seeing everything. When I started in January, I had an idea about [lab], but this whole process

and stuff, made it sure that's what I want to do, so finding where my niche is, I guess.

(Kelly)

I just feel better, I guess, more confident I suppose in that this is really what I love, that this is what I want to do. (Jamie)

I have absolutely no regrets whatsoever. Honestly, I am very grateful. (Blake)

Along with this sense of confidence in their choice, participants frequently discussed feelings of maturity that this confidence seemed to evoke. Several participants discussed aspects of maturity as a significant change they observed in themselves. This shift may have related to a sense of permanence or semi-permanence with the field as they had all accepted employment. Illeris (2014b) discusses how, in youth, the identity of being a student influences identity in the same way that work does for adults. To consider this, I asked each participant to think about their life before their program and whether they saw themselves differently.

Most participants indicated that they felt they had become more mature. As well, several referred to generational or age dynamics within the workplace and how they integrated this with their relative youth. Blaine, for example, felt "just a bit more, I would say mature because the people who I worked with were older, and there wasn't a lot of young people there." While others seemed to relate this concept to entering a different stage of responsible adulthood, emphasizing what some might consider mundane aspects of working careers. As the following comments indicate, I encountered frequent references to what the participants considered adult life concerns:

[I feel] just as a more grown-up individual is all I can really say. I mean, I understand that there is a lot more bills to pay, and there is a lot more things coming ahead that's more than just a job. (Daryl)

I was like, is that what's going to happen to me? Like, am I going to be able to work these like these 12-hour shifts and then come home, pack a lunch for the kids, and then send them on their way? (Blake)

Of note, Hunter's sense of maturity seemed to derive from a shift from the learning environment to the clinical environment, whereby Hunter's response to stress had changed.

[In the classroom] I wasn't 100% sure of what I was doing, and everyone is doing different things and like I don't know what's happening, so, like I would stress out, but then like in the actual clinical setting I just didn't find it really stressful, and I don't know why, it's weird, but that's what I learned, that I am not stressed in stressful situations. (Hunter)

Personal responsibility and empathy. One of the most robust findings in the post-practicum interviews related to the personal sense of responsibility and empathy the participants had developed. Each of the participants described themselves as feeling a sense of responsibility towards the specimens they analysed. While the participants sometimes considered this as a sympathetic reaction, I consider these feelings to be empathic in nature, in that the participants were attempting to understand the feelings of others. Notably, in many cases, this did not involve direct patient care. Despite limited patient contact, these values appeared almost universally taken up by the participants. Jess exemplified this, stating, "I really care about what I do. I think that's what's going to make me good cause I care about doing things properly, I care about people's results even though it has absolutely no impact on me what any of the results are." As the following comments further illustrate, participants described several experiences working with patient specimens in which this sense of personal responsibility for the work and the patient emerged:

It's almost like you were rooting for them sometimes. Like you would see their platelets dip way too low [on an analyser] and you were thinking, shit! You know, saying to yourself, I have to get some platelets in. (Blaine)

Once I got over in hematology, and I saw Mr. Smith's name, right? Instantly, I said to myself, [the Tech III] over in transfusion, she's going to be looking for his hemoglobin. So, then I was like, this is my responsibility now. (Blake)

I was kind of in shock because, as a student, you don't think that [patient death] actually happens. Like a STAT specimen comes in, and you are not thinking about, well, if this result doesn't come out really fast, this patient won't die. Until you experience it. (Jess)

Connected with this sense of responsibility, participants identified significant feelings of empathy towards others on the few occasions when they did encounter patients. While this is also a relational aspect of their identity, it is valuable to consider that within the pre-practicum interviews, many participants did not consider themselves suited to caring professions. Yet, almost all participants demonstrated a level of empathy towards the patients they encountered. Furthermore, most participants demonstrated surprise by this. The following comments illustrate how the participants had begun to embrace these feelings:

When I was in blood collection, seeing all those people who are sick and seeing everybody, it really gets you in a place that I didn't think it would get me, not that I am not sympathetic, but I am not a people person in that sense. (Blaine)

I don't know, it's sad. You see the person that you are doing the test on, and I guess you follow the sample through and saw, you know, they had something going on and like, oh shit, that's really crappy. (Casey)

When you are working night shifts and you are in the ER, and you are doing collections, you see a face to what you are collecting, and it just makes it a little bit harder, I think. I don't even know that person, but I just felt a little bit bad for him. (Kelly)

[When in blood collection] I always try to talk to them, just to, I don't know, get their mind off the fact that they are being stabbed [phlebotomy], and sometimes they like to talk, and they like to tell stories, and I feel like if you are upstairs in a bed you are lonely. (Hunter)

Professional detachment from patients. This third theme of personal and biographical factors deals with the participants' professional detachment from patients in relation to their post-practicum professional identity.

Juxtaposed against the empathetic overtones, most participants described a need to detach from the patients and to distance themselves from the feelings they encountered. While there was an overarching sense of empathy, moments later, the participants explained they felt it was essential to view the patient as a work task and to set these feelings to one side. Kelly, for example, described the need to detach as an essential element of the field stating, "Well you gotta be able to put those things behind you, kind of, because I mean it, it makes it much harder on yourself when you take it home with you." It is unclear if this sense of detachment was a form of cognitive defense mechanism to the feelings of empathy they had encountered or if it was a pre-existing aspect of their central personal identity, but as the following comments demonstrate, the need to detach and to "not take things home" was evident amongst the participants:

I think [detachment] is good because I would get too connected, and I think it would be a really hard profession if I had to look at these people in the face. I don't know them; you have to disconnect. (Casey)

[Regarding detachment] some people are like, oh, that's really sad. But it's good—but also bad—because you don't get attached to people and you don't take it home with you.

(Hunter)

I was able to put that aside, and I didn't know if I was going to be able to, so that was, that was good. (Kelly)

Of note, Jess seemed to struggle with this type of detachment, and following an autopsy, stated, "I was actually like oh my God. She [another MLT] must completely detach herself from it, you have to, I guess. But I don't know, I am not the type of person who would be able to do that."

Relationships

In this section, I address the findings of the relationships (second emergent element, Figure 4.1) affecting the participants' post-practicum professional identity based on five themes: feelings of inclusion among MLT peers; beliefs of the importance, visibility, and (mis)understanding of the profession; collegiality with nurses; views of the scope of MLPs; and views of teamwork and its role.

As was the case with the pre-practicum, relationships with others were part of their developing identity. At this time, all participants had an opportunity to engage with the clinical environment for a full 15 weeks. As such, their experiences with their peers, other professionals, and the general patient population had expanded considerably. Accordingly, their relationships with these groups had shifted. While some of their beliefs and perceptions mirrored those encountered during the pre-practicum, many appeared much more nuanced.

Feelings of inclusion among MLT peers. As previously noted, participants had established a personal sense of belonging to the field. This belonging had expanded to their

relationships with their peers. All participants indicated significant inclusion, participation, and acceptance within the clinical realm. Notably, an essential aspect of identity development is the ingroups and outgroups of which individuals subscribe or feel as though they are included (Tajfel, 1978; Tajfel & Turner, 1979; Turner, 1975). Belonging to particular ingroups, no doubt, serves to encourage the development of common beliefs, attitudes, meanings, and values within the personality layer (Illeris, 2011a, 2014b).

I asked each participant to share any experiences which evoked this sense of inclusion. In most cases, participants focused on experiences that characterized MLTs and their preceptors as being welcoming, and relationships had formed. The following comments illustrate strong collegiality within their working groups had affected each of them positively:

[MLTs] know more than anybody else what it was like to be that student, to be the one who has all this pressure on your back, the national coming up, finishing clinical, making a good appearance, trying to find jobs. They all understood what we were going through. So, it was very easy to become a part of their group. (Daryl)

I felt included very much so, and I felt like I was helping all the time, and I didn't feel like I was just some student stuck in the corner. I felt part of the lab. (Blaine)

When you are new to a place, it's like any job; people treat you really good when you first start because they don't want you to leave. (Blake)

Everybody is great; they make me feel included. You feel like you belong. (Jess)

While it was clear the participants felt a sense of active inclusion within their working groups, as the next section details, their relationships with others were decidedly complicated.

Beliefs of the importance, visibility, and (mis)understanding of the profession. Much like the pre-practicum, participants continued to hold firm beliefs surrounding the importance of

the professional work and emphasised how their experiences had served to reinforce this. Blaine explained this as, “Seeing it makes me realize how important our job is because the doctor needs that result to be able to help that person and I didn’t think that would get me as much as it did, but it, it’s really important, and it made me realize that.” This importance was unsurprising, yet, most participants appeared to relate to this sense of importance when reflecting on their experiences with reporting patient results. Overall, they felt the medical laboratory field was a necessary, valuable, and worthwhile career.

Along with this sense of importance, ideas related to visibility again emerged from discussions in the post-practicum, though to a much lesser extent. It appeared that the participants had, at least partially, begun to reconcile with their ideas of imperceptibility or were less sure of it. As the following comments illustrate, though their beliefs surrounding perception remained, participants were more understanding of their perceived limited visibility:

Sometimes I don’t think we get thought about in the whole scheme of things with regards to the public, like when people think of a health care system, they think of nurses, doctors, patients type deal, and we are never included in that, but with regards to in-house, I think we are important, and I think people do realize. (Blaine)

In my mind, I kind of was like, it’s such a small role, no one really knows about it and stuff, and I was just kind of like, we are kind of unimportant in the basement, just pumping out results. (Casey)

Not a lot of people get to see us unless the techs are the ones who get called to the floor to collect blood. It’s the only time that patients really get to see us. (Daryl)

In exploring these feelings of visibility, it appeared as though interactions with family and friends served to temper some aspects of these perceptions. I asked each participant how

they would describe their role. Most decided to share a story about engaging with their new-found knowledge in a social setting. These social experiences appeared to be a crucial moment for them in sharing their understanding with others. It was a clear example of a point outside the clinical setting in which they were encouraged to engage with their learning. Unlike the pre-practicum interview, in which the participants showed difficulty in their descriptions to others, it appeared that there was a substantial interest in sharing their knowledge, most notably with their families and friends. As the following comments illustrate, many of the participants felt that being *seen* by their family and friends outside the clinical realm was a vital moment in shaping their relationship with the field:

You have friends and family, and you will be sitting down at the dinner table, and someone will come over and be like, hey, I gotta get some blood work done, look at my [requisition]. And it said this and that and, what does all this mean? And I am like, well, that's a test for this, and that's a test for that. (Blake)

I was not really one to concern myself with other people, but now? For instance, like my parents are both diabetics, and my mom was talking about how she was feeling some pain in her ankles and stuff, and I was like, you should probably go get your sugars and stuff checked again and get them to check some other stuff and make sure that everything is okay. (Jess)

My friend, she had to go get blood work the other day. She sent me the requisition, and she was like, do I need to fast for this? I am like, it normally says on the requisition but no you don't. So, there are little things like that, and they are like if I had to get this checked, what does this tell me? So, it's the little things like that, that people ask you for which is cool, and I like knowing the answer. (Blaine)

My grandparents came over with me the other day with their requisitions asking what they were being tested for. So, in that sense, I can finally explain to family what's happening or what they are being tested for and why. In that sense, I feel a little bit more useful at home. (Daryl)

Notably, while the idea of limited visibility appeared tempered, there were considerable residual feelings regarding limited understanding, particularly amongst the public. Most of the participants detailed experiences both inside and outside of the clinical environment in which they felt a sense of limited understanding or appreciation from outsiders:

[During a busy day in blood collection] I felt underappreciated cause there was no thank you after or have a nice day [from the patient]. Like I would say, have a good day, and she [the patient] just walked away, so I was like (sarcastically) okay bye! (Blaine)

During lab week [an annual recognition of MLPs], it was hilarious because they just [had a display which] pictured a lab with the blood collections; when it came to the public like they don't have any idea what happens in the back. (Daryl)

There are some people who I know, like older people, that won't fully understand what I do. (Kelly)

Collegiality with nurses. As demonstrated within the pre-practicum interviews, feelings around other fields, particularly nursing, emerged and appeared to be veiled with a level of contempt towards the professional stature of nurses. At this stage, although complicated feelings remained, most participants had seemingly developed genuine respect and appreciation for nursing. This development was surprising from my perspective as a practicing MLT as I have historically observed significant tension within the clinical environment between both nurses and MLPs. This finding appeared to be informed by the participants' encounters with nurses in the

field. The relationship between the participants and the nursing profession was one that had shifted from that which was informed by their expectations to that of their lived clinical experiences. As the following stories demonstrate, participants emphasised a need for teamwork, an increasing need for communication, and a need for equal levels of respect:

[Nurses] are on the front lines, like they are really important. I wouldn't be able to do what they do, but at the same time, they wouldn't be able to do what they do without results from us. So, even though you don't have much contact with nurses in clinical, you see them bringing down a sample every now and then, you need to all work together to ensure the best patient care. (Jamie)

I mean, we need nurses; we need their work, they give us specimens and all that kind of stuff. So, we need them, they need us, they need our results to give to the doctors.

Doctors need us. Everyone needs everyone. And I feel it's just, it's just one big, one big team. (Jess)

[Nurses] are those people that are, you know, they are your primary care. So, they are on the battlefield, and I am just kind of sitting back, you know. You don't want to be stepping on anyone's toes because they are having a rough go of it. (Blake)

I know that nursing doesn't need to know everything we know, and we don't need to know everything that nursing knows, but there needs to be some compromise in a sense so that there is no second-guessing. (Kelly)

On reflection of an experience regarding a difficult conversation between a physician and an MLT, Hunter was the only participant who seemed to retain any significant amount of frustration with nursing stating,

In chemistry, a girl called up a critical result, and the nurse was like, Oh! It was a high glucose, and the nurse was like, So? Like I shouldn't give him this next dosage of whatever? And she [the MLT] was like [shrugs shoulders], and she couldn't tell the nurse like no don't do that, it's not her place, but at the same time, she was like trying to tell her [that she could not]. (Hunter)

Moreover, there was a level of commonality with this experience, and all participants made a note of nurses raising questions related to laboratory procedures or values. In most cases, participants saw this as a function of team-based approaches, and as the following comments illustrate, it allowed for a sense of importance to develop:

Just the fact that almost every hour, a nurse is calling down and asking you something. Regarding if it's something about MEDITECH [an information system], like how to order something, or if it's what they have to do with a urine or something like that, they are always calling. And I didn't realize before, that they look [to the lab] so much for stuff like that. (Blaine)

I would say that I felt important when I made that call, the call I made to that nurse was vital for the information she needed for the patient. (Blake)

Like they ordered [a test], and we released the results, and then two minutes later, there would be another sample, and before we even had that one released, there would be another one. So, I guess just listening to the phone conversations that the tech was having with the nurse, and then the nurse calling back down and explaining everything that was going on, I guess that made it feel a bit more, like more of a team, cause you know that your work is giving it to somebody else and like they are going to do something with that. (Jamie)

Views of the scope of MLPs. Along with their changing relationships with other professionals, including nurses, participants demonstrated a differing understanding of the role of their peers. Throughout the practicum, they developed a much more nuanced understanding of their relationships with other MLPs. In the pre-practicum interviews, for example, participants' view of the term technician (a term sometimes used in central Canada for MLAs) was problematic. They had further established respect towards MLAs and senior technologists, including tech IIs and IIIs, whom they considered in many cases as mentors.

MLAs. In addition to what participants had taken up about their MLT peers and perceptions of other professionals within the laboratory environment, all participants had developed several views surrounding those of which they were frequently interacting. These views focused heavily on the role of the MLA. In my experiences as a teacher and practicing technologist, I have noticed certain levels of friction between technologists and assistants in the past. In some instances, this pertained to the scope of practice wherein technologists have observed a social hierarchy within the laboratory. For the participants, it appeared that aspects of this hierarchy may have been present but were tempered by their experiences. Hunter summarized this as, "I realize MLAs do a lot more than I thought, but, for the most part, it was just like, there are more tests, and there is more to lab work than people originally think." Other comments about MLAs centred on an expanded understanding of the role, mainly as it related to pathology:

[During autopsy] I thought it was, a pathologist who was going to be cutting her open, I thought that was super-specialized work but, like holy crap, [the MLA] gave hell and she did it so well, and it was just like, man that's wicked, so I have way more respect for MLAs in general. (Casey)

I didn't realize how much MLAs role in the autopsy was until I actually saw it. So, it was actually super interesting that way. (Kelly)

[MLAs] also handle a lot of stuff with transportation of goods and such, and shipping stuff out. So, that was interesting because I understood what she meant when she was like, it is very annoying when people think the only thing you do is take blood. (Blake)

Notably, in many instances where the participants described a shift in their view of the MLA, it was through direct interaction with MLAs during the performance of their duties. This level of respect was of significance, as the scope of practice between MLAs and MLTs varies widely. There appeared to be no sense of subordination towards MLAs, and instead, a level of admiration was evident.

Tech IIs and Tech IIIs. The role of tech IIs and tech IIIs (supervisory technologists) was a frequent topic of discussion. All participants had formed beliefs about tech IIs and IIIs, most of which were positive. In many cases, it appeared that the tech IIs took on mentorship roles with the participants, and as the following comments illustrate, many participants established a substantial level of respect towards these technologists:

The Tech II job sounds cool to me, and just being a leader, but still, in amongst the people. I thought they would be more up into the office, but tech IIs are very much still on the bench. (Casey)

[Tech IIs] have more responsibility and that they got to do things, for example, the tech II in blood bank, like she has the over say. She is so smart, and she knows everything, and everyone looks up to her, and she can explain everything. (Jamie)

[The Tech II] was the one who would do all the high-profile stuff like the anti-Ch or the Yk^a. She was the one with all that, and it was interesting to see. (Jess)

All participants placed considerable focus on the roles of senior-level technologists within the field, and admiration of their skill was evident. All participants felt the knowledge that tech IIs and tech IIIs held was positive. Connecting with the participants' views of supervisory level technologists, was a universal acknowledgment by participants that experience within the clinical realm was a desirable trait:

It made me feel, like, all these people are so smart, it intimidated me, but it made me really excited to become that [Tech II]. (Blaine)

She [the Tech II] is so knowledgeable of what all the results mean. She really cares about what she does, and she is looking at the result, and if something comes up, if it's a weird result or whatever, she is always going through stuff, and she is like okay, well this is off, and this is off, so that makes sense. She would talk me through it, she was great, she was really good. (Jess)

The acknowledgment of experience, which commonly correlates with age in the clinical environment, was not universally positive. Some participants had differing views regarding the relationship of other less experienced and or younger technologists. Casey explained this as, "I would have thought a younger tech might have been more helpful for me, but definitely the more experienced older techs were a better influencer for me." Conversely, some participants seemed to relate more strongly to those colleagues who had graduated more recently. It is possible that this was a result of the typical age variance within the NL MLP environment. The ML environment is currently undergoing a human resource shortage wherein a vast majority of MLTs are eligible for retirement. In NL, these individuals are commonly in their mid-late 50s, which is a sharply different ingroup to the relative average age of CNA MLT students.

Mentorship. While participants had developed an understanding of the scope of the field, also important was the relationships with their MLP preceptors. For context, within the participants' program, preceptors are normally MLP practitioners of varying roles commonly known as Tech Is, Tech IIs, or Tech IIIs. Indeed, how their preceptors engaged in teaching practice also influenced their perceptions. Most participants made a connection between the varying roles of their mentors and their teaching ability:

They [preceptors] knew that we were students, and they knew exactly what we had to do. But also, they answered any questions we had, they were like oh, there is something cool happening over there, can you like come over and watch and stuff like that, and they were great teachers. (Casey)

She [preceptor] spent all the time in the world with you, if you needed anything, didn't understand anything, she was right there to teach you everything you needed to know, and if she didn't know the answer to something, she would get somebody else to explain it to you. (Jamie)

Some people I found were better teachers; they knew more about what they were doing. Some people had been doing it for a long time, but they didn't really know how to explain anything because they just, I don't know if like they didn't understand it or if they just didn't know how to explain it, but they just couldn't help, (Hunter)

Views of teamwork and its role. In addition to their attitudes towards their peers and other professionals, all participants appeared to hold beliefs about teamwork and its health care implications. All participants reflected on various experiences in which they felt they were part of the health care team and or considered the broader health care environment as a team-based approach to care. Jamie described it as,

I think it's just all like, one big circle with little pit stops, like all the different health professionals. You have your doctors, and you have your nurses, you have your lab techs, you have a million other things in between there but, I feel like we are just one small piece of that circle that joins everything together.

Importantly, health care systems in NL often take a multifaceted approach to care with distinct roles for various professionals. Teamwork is both required and ubiquitous, and the participants had begun to recognize this. Others reiterated this perspective of the medical laboratory through a growing idea of MLP as being a small piece of a more extensive system:

Just a cog in the machine, but not in a bad way. It's such a huge, just tangle of different professions and different things, that it is just, it's like [ML] is a small little part I find.

But yeah, I don't feel bad about that because you have to be able to, just be a good cog in the machine or else the whole thing falls apart. (Casey)

[MLP is] an important piece like you know, like nursing, doctors and us, we all share an important role in providing the best patient care that we can so yeah just definitely as a piece of the whole picture of patient care. (Kelly)

I just realized that it is important to work together with everyone as a team, to make sure that you are open to other points of view and other perspectives, and don't be afraid to ask for help if you don't understand something or you are not sure. (Jamie)

Professional Rhetoric and Norms

In this section, I present the findings of participants' engagement with professional rhetoric and norms (third emergent element, Figure 4.1) in relation to their post-practicum professional identity based on two themes: beliefs, attitudes, values, and meanings regarding the ideal MLP identity; and views of their learning.

As was the case for the pre-practicum interviews, participants continued to hold beliefs that the work was essential and demonstrated common ideas regarding both good and bad behaviours in the workplace. Participants also referred to several characteristics they felt were common to their learning. Much of this similarity was akin to that observed within the pre-practicum interviews, though several differences emerged.

Beliefs, attitudes, values, and meanings of ideal MLP identity. Much like the pre-practicum interviews, participants had ideas of what constituted good and bad characteristics or behaviours surrounding their perceived ideal professional identity. When questioned on what makes a good MLP, responses were primarily grounded in positive experiences that the participants had observed. As the following comments illustrate, many of their ideas related to the notion of work performance and technical knowledge as primary factors:

There is a lot you have to do thinking on your feet, I find, regarding questions that people may ask you. I never realized how many people ask you, what tubes should I take or what do I have to do with this test now? (Blaine)

[A good MLP is] somebody who has a keen eye for detail, somebody who doesn't only give 50% of the job. (Daryl)

You can't, for lack of a better word, be sloppy in your work. (Jamie)

Still, much as was the case for the pre-practicum interview, there was a tendency amongst the participants to focus on behaviours of which they felt were universally negative and were a poor representation of the professional behaviours they had come to expect. Several participants described experiences in which they felt the behaviours they observed in their peers were particularly problematic:

There is a tech there that didn't know what he was doing basically. When I was there, he basically didn't do anything, like I noticed him just sitting down, not doing anything, or walking around not doing anything. (Kelly)

Not doing things completely, skipping steps, really. I found that was a big thing in micro. People just didn't look thoroughly. [They] looked at a plate and were like that's nothing. And then that person ended up having something and stuff like that, so half-assing it really and being lazy is a really big thing. (Blaine)

Moreover, participants expressed that many of the negative behaviours observed related to work ethic and how MLPs participated in the day to day routine nature of an everyday workplace. Most notably, there was an expression of ideas about bad workers in a more general sense relating to productivity and teamwork:

I think what makes a bad MLP is the same thing that makes a bad worker even when you work like any other job. (Blake).

Bad examples I have seen are just people who are just, like bad employees, like lazy, or just gossiping all the time, causing trouble in there, just in the group setting and being a shitty team player. (Casey)

I find that there's a lot of butting heads, and there's not a lot of teamwork, so that's lacking on the patient care. (Daryl)

People who don't really care, people who are kind of like, run the sample and see what's on and just send it off. And when you ask them a question like what's going on or why is this happening, [they respond] oh I don't know, just kind of deal with it. (Jamie)

Views on their learning. All participants made a note of their learning experiences as tied to the completion of tasks and work. Most learning experiences described were experiential,

and participants felt their learning benefited through the observation and completion of tasks within the clinical realm. As the following comments illustrate, participants focused on how the clinical realm allowed for more nuanced learning to occur:

Once you are sitting there and every day you are just streaking out a plate, and they say to you, now put it on that one. You know that has to go in that one, right? It just started to piece together so much better, like I almost had to be doing it. (Blake)

It connected and made much more sense to me. To be like, okay, this is where this happens, and this needs to happen here, and like the [blood bag] filter, I had no idea what the filter looked like. (Casey)

I think just being out there and seeing things helps me learn better even if I just take the littlest thing. [Now], I can just think about it when I am reading my notes, and like oh yeah, this makes sense now. Or like I remember seeing that and someone saying something about it, it will click in my head as opposed to just reading it. (Jamie)

All participants held positive views on the practicum when compared to their didactic training. These views focused on their interpretation of laboratory results and the correlation with the underlying pathophysiology. As the following comments illustrate, the idea of connecting the dots associated with various diagnostic test values with the underlying condition of the patients was highly significant:

I didn't know that they do D-Dimers for stroke. I didn't know that before. So, they do a D-Dimer and an APTT, that's the protocol, I didn't know that. I just, I always associated D-Dimer with DIC. That was always what we correlated it with. (Blaine)

It's so much easier and so much more important to be able to understand, like well, this is low, maybe I should just check back previous history and see if this and this is going on.

Or maybe I should check and see if they are on antibiotics to see what kind of thing is going on. I think it's just important to be able to understand everything that's happening, why you are receiving those results, what else you are receiving, and how that's gonna impact other results. (Jamie)

Being able to touch things in the lab and seeing them for yourself and looking at a real panel and looking at you know a real microbe and smelling it, it makes more sense and I know that we had it here, but like it always felt like it was, fake, you know. (Casey)

Just how like there is a smell to *Enterobacter* and stuff. I am just like, I don't learn about a smell for *Enterobacter* [from a book] and that like *Pseudomonas* actually smells like grapes, it doesn't smell like corn tortillas (laughter), it smells like pure grapes. (Jamie)

Summary of the Post-Practicum Professional Identity Themes

As was the case for the pre-practicum interview, the data allowed for the drawing of a general picture of the participants. Following the clinical practicum experience, the participants had developed confidence in their choice and suitability towards the profession. Complementing this increased confidence was a growing sense of maturity, and all participants found themselves excited about the prospect of their future careers.

Nevertheless, participants struggled with their developing feelings of personal empathy and responsibility as well as the incorporation of these feelings into their sense of the profession and personal identity. Contrasting this struggle was a tempering of feelings towards other professions, including nursing. Moreover, there was evident developing collegiality with the nursing field. Along with these changes, participants continued to develop a more nuanced understanding of the profession and had begun to engage more fully with the professional

rhetoric and norms associated with the field. Table 4.2 provides a complete summary of the elements and emergent themes within the post-practicum.

Table 4.2

Summary of the Post-Practicum Professional Identity

Identity Element	Emergent Theme	Summary
Personal & Biographical Factors	Clarity, confidence, and maturity about career choice	Participants had developed increased technical and personal confidence in their skills but also a personal confidence in their choice to enter the field and a sense of belonging. Participants felt a sense of increased personal maturity resultant from their time in the workplace.
	Personal responsibility and empathy	Through reflection on their experiences, participants demonstrated an increased level of empathy and responsibility towards patients and their results.
	Personal detachment from patients	Juxtaposed against the developing empathy participants felt there was a need for professional detachment.
Relationships	Feelings of inclusion among MLT peers	Complementing the feelings of belonging that the participants felt was a sense of inclusion through the growing relationship with their MLP peers.
	Beliefs of the importance, visibility, and (mis)understandings of the profession	Participants continued to hold beliefs regarding their public image and how they were perceived; however, this was tempered considerably, and a level of understanding of other views appeared to emerge. Participants had begun to engage with family and friends as a means of professing their chosen career to increase this understanding.
	Collegiality with nurses	Sharply contrasting with their pre-practicum perspectives, most participants had established a level of professional courtesy and empathy towards their nursing colleagues.

	Views of the scope of MLPs	<p>Participants had established a respect for the MLA peers and had begun to develop a nuanced view of their role.</p> <p>Participants had begun to develop a level of respect towards the senior-level technologists in the field and had engaged in significant mentorship through their practicum.</p>
	Views of teamwork and its role	Along with their growing collegiality with nurses and other MLPs, participants had developed a significant appreciation for teamwork and its role within the contemporary health care setting.
Professional Rhetoric and Norms	Beliefs, attitudes, values, and meanings of ideal MLP	Participants had continued to develop ideas of what characteristics were considered positive and negative.
	Views on their learning	<p>Participants identified significantly with informal and experiential learning.</p> <p>Participants made significant reference to result correlation as being significant for their learning.</p>

In addition to the themes summarized in Table 4.2, an essential distinction in this phase of the research was the focus on the experiences of the participants. A significant theme emerged in the data relating to the perceptions of critical experiences that meaningfully impacted the participants. I have chosen to segregate this interwoven theme from the others as these experiences serve to provide context for those experiences which the participants felt were most meaningful. Many of these experiences were powerful moments and evoked complicated feelings and emotions amongst the participants and are key points of discussion in the following chapter, particularly as they relate to the concept of the disorienting dilemma.

Disorienting Dilemmas During the Post-Practicum

In addition to the findings of the participants' pre- and post-practicum developing professional identity are the findings associated with the practicum experiences that influenced

the shifts in identity. Thus, in this third major section of the chapter, I present the theme of *disorienting dilemmas during the practicum* that is associated with the change in identity and transformative learning.

One of the central aspects of transformative learning is Mezirow's early concept of the disorienting dilemma (Mezirow, 1981, 1991, 1997, 2012), wherein experiences that do not fit within the established meaning perspectives require reframing. As such, it was necessary to explore in detail the most meaningful experiences of the participants as these have the potential to catalyze such reframing. While Illeris (2003a, 2014b) is somewhat critical of Mezirow's overly cognitive approach, there is a clear link between the concept of the personality layer and meaning perspectives. As such, I have chosen to use Mezirow's early terminology of disorienting dilemma to discuss the myriad of participant experiences described.

At the start of each interview, I asked participants to tell me stories about their practicum, how they felt about it, what they felt were the most memorable moments, and how these experiences made them feel. In sharing their stories, I classified their experiences into four key categories. Though the individual experiences were broad, they mostly fell into those involving living patients and their results, those related to autopsy or cadavers, those involving mistakes the participants made or observed, and those experiences that fall into what I loosely categorized as workplace culture. In the final section of this chapter, I describe these categories and the experiences described by the participants.

Experiences Involving Patients

All but one of the participants described detailed direct or indirect patient experiences that appeared to affect them through an emotional or caring response. These responses were deeply meaningful, and I discuss this further in Chapter Five, but fundamentally ranged from

concern to sadness, to a disbelief in the reality of health care. Notably, that health care professions can include interaction with the critically ill. In listening to the participants' stories, I recalled many of my own experiences as a clinical practitioner and was, in many cases, able to relate strongly with them. For me, as a practitioner and educator, one of the most fascinating stories shared was that of Blake, who, during a routine blood collection procedure at a patient's bedside, described an experience with a young man who was gravely ill. As Blake described,

I never seen someone so sick in my life. He was this young man, I am the same age as this guy, and it could just as well be me in the bed there. He can't move, he can't lift his arm out, his mom is just sitting there looking at him, and I was like [Long pause], there was that moment of apprehension. I was like, I don't know if I want to touch that guy. I have never seen someone in such a sorry state.

This experience appeared to be a powerful one for Blake, evoking a visible reaction during the recollection of the event. Blake demonstrated a somber tone and thoughtfulness during the description that I have rarely seen in my experiences with students. Indeed, Blake was visibly moved and apprehensive. Blake's apprehensive in touching the patient was beyond my expectation since I had not experienced this level of hesitation as an MLP student. Other participants shared similar stories of how their patient encounters affected them. For example, Blaine's experience with a patient centered on being on-call with one of the supervising technologists. Laboratory environments often employ on-call shifts, much like other fields wherein technologists are off-site and will be called-in when needed. In many instances, this involves being directly involved in patient care. MLPs often find themselves in clinical areas like the emergency room, intensive care unit, or other patient areas. Notably, this is not universal within the profession as many technologists (particularly those in urban environments) may

never have this encounter. As follows, Blaine described in detail this first on-call experience and how this experience seemed to impact the view of the role:

I was on call one night with one of the techs, and it was crazy that night. This person, we went to emerge, and the person was pale as a ghost, and she couldn't really talk to us, but she was moaning, and she was so upset, but she couldn't show any emotion. She was cold and clammy. I was just like, man, you are so sick, and [while searching for a vein] I couldn't feel anything. Her blood pressure was non-existent almost and I couldn't feel a vein to save a life. Anyways, I got the tech to do it [collect blood], and she got it or whatever. I was just like, man, this person is so sick, and it really hit me. (Blaine)

This experience occurred near the end of Blaine's practicum, and by Blaine's description, it was a particularly moving event evoking a sense of difference in perception and feelings of responsibility. Blaine's view of patients had become more humanized. During the interviews, I took note of the level of empathy for the patient as, in my experience as an MLT educator, many students do not demonstrate this type of caring during their classroom training. Indeed, in many ways, this level of empathy was somewhat counterintuitive in that MLPs are taught to consider the patient in an overtly scientific manner with a focus on analytic variables. As the following excerpt illustrates, these feelings were not unique to Blaine as Kelly experienced worry about a patient who had just undergone a bone marrow aspiration. In this instance, the patient was unaware of Kelly's involvement, and the circumstance resembles looking at a person through a one-way mirror:

Seeing him [a patient] obviously in pain, no doubt [during the bone marrow aspiration], and then going to lunch and seeing him like sitting down in the hospital [cafeteria], it just kind of, I don't know, I was just kind of like, I don't want to say worried about him, but,

whenever I saw a sample come down from hematology, I knew his name, he always has units in the blood bank. Just things like that, to see a face with it, that's what makes things different. (Kelly)

These patient experiences extended beyond those accompanied by actual patient contact. Blake, Casey, and Jess, for example, made a note of results as particularly significant, despite having no direct contact with the patient. In one instance, Blake shared a story relating to a likely terminal diagnosis from a peripheral blood smear stating,

It just totally caught me off guard, I didn't understand that what I was looking at was the end of someone's life really, that this was the science that like there was nothing that you can do, this person is old enough now that like any course of action wasn't going to like, it might have given him like a couple of months just to get their affairs in order, but it wasn't going to save their life.

Others believed that the communication of critical results to the appropriate care provider was highly significant. For context, within the field of laboratory medicine, a critical or panic value is a result obtained with the potential for immediate impact on patient care and is thus always communicated to the primary care team immediately. Several examples of this were shared as follows:

We were always getting something. You see a chloride that was off the charts, or you see a blood gas result that had a critical, maybe like a critical CO₂, or maybe like a bicarb was really low, and then they were looking at me well, you gotta phone them. It's a critical result, make sure you get that across to them. (Blake)

When QC came in, we ran the specimen, and it was still within the hour for the STAT specimen, but then when we called the critical, the patient had already died. You realize how important your results are; it was a critical potassium. (Jess)

After you call a result or you see someone who had a [high] critical result and then they are gone way down, they are way better and stuff. You are like, oh, that's good, and you were part of helping them because you got and called the results. (Hunter)

It appeared a significant moment within the practicum was the realization that at times, they are responsible for what are life or death decisions and or actions. They were no longer students, and their actions had the potential for grave consequences.

Experiences with Autopsy

While not all participants had an opportunity to take part in an autopsy, those that did, emphasized that the experience was especially significant. When asked what they felt was the most memorable experience, all five participants who were able to participate, indicated the autopsy stood out. Participants fixated on both the abstract aspects of death and the nuances of working with cadavers. Jamie described the experience as “I was just mind blown, I was just like, I just seen someone's entire body, inside and outside. I guess it makes you think about the repercussions of not staying in good health.”

As the following comments illustrate, the participants' responses to autopsy were diverse, and in some cases, the participants were unsure about how they felt when confronted with the juxtaposition of caring and detachment:

Surprisingly you know, we had the autopsy just before lunch and, I had no problem [eating] (laughter), and I didn't know if I would. I was weirdly able to detach what was in

the room, what was going on, and then when I left, you know being able to kind of just put it behind me kind of thing. (Kelly)

The [body] still had, they were intubated, and watching her take that out was hard to watch. I don't know why, but, out of everything, that stood out. That and when they were trying hard to get her skull broken off, like sawing it and stuff, I found that weird. (Jamie) I think maybe the family just didn't understand how much they do in an autopsy. It's not that they are doing this, but it's like they hack them to pieces [long pause]. The person that I had seen was an elderly man, and as far as I am concerned, this is natural for him to die at 80 years old. I am not the family, I don't know the medical history, I don't know, but why would you do that? They literally take your whole body apart. I don't know, I just felt, even though, that person is dead, I felt bad for them. (Jess)

While student participants had mixed emotions regarding autopsy, they unanimously considered it a significantly positive learning experience. While Jess seemed emotionally moved, along with Blaine and Kelly, it was Casey's response that was the most enthusiastic to me as an educator. For Casey, the autopsy served as a reaffirmation of the decision to enter the field in the first place and was an overtly positive experience giving a sense of belonging. Casey recalled nearly every detail of the experience:

We gowned up, and it was so exciting. I didn't realize that the MLAs were the ones who did all the hard work, they are the ones who cut [her] open and opened it up. The doctor is just there with his little scalpel ready to cut open the heart and stuff. It was just wicked. The whole process was, just, it was bizarre, and it wasn't anything like what I expected. I expected everything to be dark, like in a movie, you know. It was super bright, exciting, the smells, it smelled horrible. And she was super large, the corpse I guess, so there was

so much adipose tissue, and it was just, I don't know. It was just the coolest thing ever and I was eyes and ears into it and it was just, just seeing how the human body inside. Yeah, it's a little traumatic. I have images of it sometimes, but also, I don't know, it's just, it is exactly what you are taught, and I guess that's a good thing. (Casey)

It appears the autopsy left them with a different sense of appreciation for the work as well as those performing the autopsy. As was previously indicated, there appeared to be a level of admiration towards MLAs in the post-practicum, which seemed to be partially derived from the MLAs central role during the completion of an autopsy.

Experiences Involving Mistakes

Along with the emotional experiences involving patients and bodies, most participants indicated a heightened sense of concern around the impact of errors within the laboratory. Several participants described an error of which they were at least partially at fault or witnessed, and I probed how they reflected on these errors. Jamie shared a lengthy story about a critical error that resulted in patient harm during the clinical practicum. While Jamie was not responsible for the error, it involved the release of an inaccurate result by another MLT whom Jamie was working with, and in which the patient received incorrect treatment following the error. Jamie focused on the emotional turmoil that the MLT that made the error demonstrated, stating, "the patient lived, and they were fine, but I don't know, I think that was just really scary. That stuck with me because I feel like if [I made the mistake], I would be the same way. I feel like that would just hit me hard, especially if anything were to happen to the patient."

Participants detailed several instances of mistakes with responses tending to move between those tied to their sense of fault, the emotions that evoked, and how their errors were visible by others. Blaine and Jamie, for example, each described an error that had minimal

impact in which the quality control for the tests they were performing was incorrectly performed (a common mistake for new MLTs). Despite their minimal impact, they were each significantly affected by the mistake:

I didn't click the specific QC cause I forgot we had to, it reran the whole QC again, and everything was almost [out of acceptable range], the whole screen was pretty much red which means we couldn't report any of the patients' results regardless of what our QC was that morning since we ran it again. So, I was like, oh my god! There were four stats up there, and I just screwed all this up! (Blaine)

So [QC] ran, and it was coming up errors, so I saw the error, and I put it back on, and I didn't tell anyone that I put it back on, which was so stupid. One of the techs that just graduated from here, she works there, and she was just like; did you just put that on, that was flashing, and you didn't tell anyone! I said, I just thought you were running the second one for the patient control, and then she just like completely, she was just like super saucy and rude about it. (Jamie)

Other participants tended to focus on the idea of ownership and the potential permanence of mistakes made. As an educator who has witnessed many mistakes made by students in the simulated clinical laboratory, this was a meaningful discussion, as learning from mistakes is a critical moment. As the following comments demonstrate, this realization appeared to be an important one for them:

[If I made a mistake] I would say I am the least experienced, the least experienced person here, I believe I am the one who made that mistake. (Blake)

I hadn't done anything wrong, so I was mostly just annoyed about the fact that people were saying that I had done something wrong. (Hunter)

I found it was a lot more if you screwed up, there's no fixing it, especially when it came to precious specimens, you know there was no going back if you ran out of specimen, there was no fixing that. (Daryl)

Workplace Culture

In addition to the experiences relating to results, patients, and their own internalized feelings surrounding these experiences, participants appeared cautious regarding workplace conflict and were apprehensive when it occurred. Five participants described circumstances in which they observed conflict or tension in the workplace and indicated a particular aversion to what I have categorized based upon my own lived professional experience as “office politics.” Moreover, the participants often perceived those who engaged in these types of behaviours [office politics] as those they deemed less than ideal in their working ability. Unlike the more emotional aspects of the previous experiences, much of this focus on workplace culture seemed to inform the participants' understanding of the ideal characteristics of the MLPs. Blaine, for example, described surprise upon realizing that there may be discontent in the workplace, stating, “There was one day that there was a big argument and I didn't even know what to do. I just kind of sat there. And it was against the core lab and histology, and I didn't realize there was so much beef between those.”

Several participants expanded into their disdain for office politics by others. It appeared that the participants had a general discomfort with conflict. It is possible that this discomfort was associated with their relative inexperience with the clinical realm, or it may have indicated a more significant discomfort with others. As the following comments illustrate, the participants were significantly surprised and affected by such conflict:

You hear about something that happened a few weeks ago or whatever and there was like

a big outburst, and you are like what the hell man? It wasn't even anything directed at me generally, just interoffice politics garbage, attacking behind people's backs. (Casey)

[I dislike] people who get so caught up in the politics of what's happening in their surroundings that it's now lacking on patient care. People who are caring more about what if something were to happen, or what will happen because they are not getting along with so-and-so. And instead of trying to confront things one on one or trying to resolve issues, they let it boil up, and finally, that just consumes them, and I see that a lot. (Daryl)

I found in core, there was one person in chemistry, one person in hematology, the person in hematology, didn't do any work, and they left at eight so the person who was there until like twelve had so much other work to do because that person just didn't want to do it and so that's a really big thing. (Blaine)

Conclusion

One of Illeris' (2015) central ideas is that we have to make changes in our identities frequently, and we make these changes precisely by transformative learning processes. Illeris (2014b) argues thoroughly towards defining transformative learning as “learning which implies a change in the identity of the learner” (p. 40). As the results of this chapter demonstrate, the clinical practicum provided an opportunity for many rich in-situ experiences, and in many instances, participants demonstrated significant shifts relating to their professional identity.

In the following chapter, I discuss these results relative to the theoretical framework to evaluate the changes that have occurred as a function of time. I also attempt to pull apart the layers of identity development of the student MLPs to understand and improve clinical practicum experiences for students.

CHAPTER FIVE: DISCUSSION, IMPLICATIONS, CONCLUSIONS

Overview

I undertook this study to explore how medical laboratory professional (MLP) students navigate the development of their professional identity during their first significant encounter with clinical practice. I was interested to learn how their professional identity was developing, what experiences most strongly supported their identity development, and how they took up the discourse of the medical laboratory field. This inquiry emerged from the difference I perceived in my students following their clinical practicum. I was curious to explore how their exposure to the clinical realm affected them, what they had learned, and, most importantly, how their professional identity had developed. Guided by a theoretical understanding of learning as being situated within the cognitive, emotional, and social tension field; professional identity as one layered identity amidst many; and transformative learning as being marked by a shift in identity (Illeris, 2003a, 2014a, 2014b, 2014c), I examined key aspects of the identity that students had developed before and after their clinical experience. Through this examination, I identified and grouped the most prominent characteristics evidenced by the participants in terms of their sense of personal or biographical identity, their relational or social identity within the profession, and the convictions, values, behaviours, and norms related to the profession that had developed.

In this final chapter, I draw upon the theoretical framework and findings of the study to discuss the shifts in professional identity of the participants following their clinical practicum, why these changes may have occurred, how their professional identity appeared following their clinical practicum experience, and a general structure of the MLP professional identity. I structure this chapter by sequentially addressing the primary research questions followed by a discussion of the implications of the findings to the future education of MLP students.

What Changed in Participants' MLP Professional Identity?

In this section, I address the research question regarding what changed in the participants' professional identities. I organize the section around four main themes resulting from the findings in Chapter Four: changes within the personal narrative, solidification of the professional identity through changes in relationships, what changes did not occur, and a model of MLP professional identity.

Changes Within the Personal Narrative

To any learning circumstance, individuals bring their narrative to the forefront and have established ways of being and knowing that are unique to them but also potentially shared. Of course, the participants in this study were no different, and they brought forward various perspectives, ideas, and attitudes towards themselves and others, as well as the broader medical laboratory field. As an example, they each brought to the table, a genuine interest in science, biology, and health care careers, as well as their familial influences such as the parent nurse. Fundamentally, the participants started their clinical practicum with a set of ideas, convictions, and values which formed from and within their multifarious (varied or many types of) identity. Following their clinical practicum, significant changes relating to how the participants viewed themselves occurred. Most importantly is the *shift from student to practitioner* and a realization of the potential care role they held regarding *developing responsibility, caring, and empathy*.

The shift from student to practitioner. Identity development is a fluid process, and the participants had begun to form aspects of their professional (work) identity before the clinical practicum. Thus, in addressing the participants' shift from student to practitioner, I consider two interconnected sub-identities: their 'work identity' (Illeris, 2004, 2014b) and 'student identity,' both of which are related to professional identity. It is important to emphasize that while work

identity is a crucial part-identity (Illeris, 2011a, 2014b), the work, student, and professional identities are difficult to separate. The concept of ‘work,’ for example, is not limited to employment for pay and may extend into the realm of the formal training environment. In this instance, it is valuable to consider the work and professional identity as synonymous, with the student identity functioning as an early partial surrogate to the work or professional identity for the participants. As previously noted, Illeris (2011a) states, “professional identity is a special type of work identity that is typically developed through a combination of vocational education and work” (p. 40).

During the post-practicum interviews, it was evident that many of the student-oriented aspects of the identity had been shed or supplanted by the more employment-oriented aspects of the practice, including shifting understandings of ideal performance, tempering of views, and feelings of personal maturity. The responsibility the participants undertook in the clinical setting (compared to the responsibility they had in the classroom) was a significant contributor to their growing maturity. As an example, while participants continued to hold beliefs about the visibility of the profession, they appeared to be much less preoccupied with professional visibility and had established a more tempered approach to the views of others. Furthermore, many of the participants had engaged in a level of mature adulthood related to recognizing their non-student responsibilities with their references to feeling more adult. They were less concerned with academic success but with practical ability, developing competence, and ensuring task completion. Moreover, participants had begun to identify with the ML field outside the clinical realm, as was evidenced by their interactions with family, friends, and peers. This finding speaks to the moment of shift between the part-identity of the student to the part-identity of work or professional (Illeris, 2014b).

These findings regarding a change in the participants' identities suggest the importance of the clinical experiences in supporting their development as MLPs. The practicum provided them an opportunity to begin to develop ways of thinking and acting that are associated with *being* an MLP. Later sections of this chapter discuss specific aspects of their practicum experiences that explain the changes in their identities.

Developing responsibility, caring, and empathy. In addition to the changes which occurred relating to a shift away from the identity as a student, the development of revised feelings towards others occurred. Identity development is not merely internal to the self but also formed in relation to others, and its development is a holistic endeavour involving the cognitive, emotional, and social dimensions (Illeris, 2003a, 2003b, 2014b). Following exposure to the clinical realm and the interaction with patients this entailed, participants demonstrated heightened levels of responsibility, caring, and empathy, specifically as it related to the patient. They developed a sense of “reality” that accompanied their growing knowledge of the field and had begun to recognize that their actions had real-world consequences. Almost all participants described what could be considered emotionally moving moments during their practicum. These moments evoked emotions of caring, empathy, and even humility, which they then incorporated into their developing sense of professional identity. Many of the participants were surprised by how their experiences had begun to impact them.

Furthermore, the participants had begun to internalize this development within their personal narrative and had begun to see themselves as caregivers through their sense of responsibility towards the patient. The participants had incorporated an aspect of caring into the personality layer of their professional identity, but this was a complicated process. In many cases, participants struggled between their developing sense of caring and their feelings of a need

to be detached. These struggles and the internal reflection that resulted marked what I consider a clear example of a disorienting dilemma as defined by Mezirow (1981, 1991, 1997, 2012) wherein their experiences required a reframing of the meaning perspectives that they had constructed throughout their personal and classroom experiences.

Moreover, this shift was a moment of which I also consider a clear example of transformative learning (Illeris, 2014b). For the participants, their role was no longer the student, and they had arrived at the conclusion that their actions had meaning in relation to others. They realized that they were, in many instances, responsible for decisions having the potential for life and death of others, and the weight of this responsibility had begun to bear on them. While they had loose conceptualizations of this throughout their pre-practicum identity as shown by their feelings of the importance of the field, during the practicum, they had encountered individuals in pain and suffering, and in some instances, had been directly responsible for their treatment or even their autopsy. Fundamentally, their narrative changed through their lived experience, and they had begun to internalize and reflect on the potential consequences of their actions. This reflection triggered a strong sense of responsibility and empathy towards others, which was an essential extension of their theoretically informed knowledge and expectations formed pre-practicum.

Solidification of the Professional Identity Through Changes in Relationships

While the shifts within the personal narrative were significant examples of identity transformation, a second broad area of change relates to how clinical practice allowed for the solidification of the developing professional identity of student MLPs. My research supports the conclusion that the exposure to the clinical practice allows for a shift in the narrative, but also that aspects of this shifted narrative become solidified or stabilized relationally (Illeris, 2014b).

For the participants, this solidification occurred during their clinical practicum and was far more than a mere understanding of the knowledge gained relating to the technical aspects of the field. Two situations that strongly influenced this are their shifting relationships with other professionals, and their developing sense of belonging.

Shifting relationships with other professionals. Participants' ideas surrounding nursing provide an excellent example of how the relationships with other professionals contributed to the participants' identity during the clinical practicum. At the pre-practicum stage, participants understood nursing as a caring profession and one recognizable by others. They had also established a perception that MLP was less prestigious than nursing in the eyes of others, and this translated into a negative view of nursing reminding me of Moje, Luke, Davies, and Street's (2009) "*identity as difference*" metaphor. The participants had anticipated and prepared for a poor relationship with nurses and had established an understanding of the nursing profession despite limited professional interaction. These perspectives had derived from their pre-existing ideas and relational experiences with others, their families, and the media. Moreover, many participants had chosen to enter the medical laboratory field as a decision of what *not* to become, as opposed to an active decision *to* become an MLP.

The post-practicum interviews demonstrated this view was substantially tempered following their clinical practicum experience as participants had considerably modified their perspective of nurses. They developed a genuine respect for nurses and one that was, in some instances, empathetic to what they perceived as the struggles of the nursing profession. Thus, their experiences with nurses during their clinical practicum did not fit with their pre-existing ideas and required a reframing of their understanding. This reframing modified their relationship with nursing in a meaningful way and was a second example of transformational change.

Furthermore, the participants reframed their positionality with nursing. While the participants retained some concern regarding their limited visibility, it was subtle and incorporated aspects of understanding regarding how visibility unfolded in relation to the required work. The participants had also developed a modified view of both teamwork and the hierarchy within the profession, such as was the case for MLAs, whom they had initially identified as somewhat less involved in the clinical practice. Fundamentally, the participants had moved away from an “us” versus “them” conceptualization of the profession and had begun to incorporate aspects of shared responsibility towards care.

This finding is particularly important when considering the ongoing trend towards interprofessional collaboration. In recent years, significant focus has been placed on the interconnected areas of interprofessional education and interprofessional collaboration (IPE/IPC). Health care education has been inundated with movements and trends towards collaboration in health care with an accepted philosophy that it benefits patient outcomes (Reeves, 2009; Reeves, Lewin, Espin, & Zwarenstein, 2010). Yet, criticisms have arisen regarding the role, and future MLPs may have in IPE/IPC approaches, given the MLP is often less visibly involved in the care of the patient (Hardy, 2013). While focus has been placed on the benefits of IPE/IPC (Curran, 2011; Curran, Fleet, & Kirby, 2006a, 2006b), less attention has been placed on how IPE/IPC approaches implemented in health professions’ education programs, may serve to impact the developing relationships the MLP has with other health care professionals. Salazar (2017), for example, discussed how MLT students expressed difficulty being recognized with a professional identity within the health care team, concluding that other health professions have an insufficient understanding of MLT work and how this contributes to

an underdeveloped professional identity among MLTs. The exclusion of MLPs from the IPE/IPC trend has occurred despite the fact that MLPs are frequently indirectly involved in patient care.

For the participants of this study, this underdeveloped aspect of the professional identity seemed to have been at least partially resolved through engaging with the clinical practice. It was the rich in situ exposure of the clinical practicum, which served to foster meaningful change. This shift in the professional relationship between the participants and their nursing counterparts supports an approach towards IPE that seeks to encourage and expand the professional identity of the MLP student, particularly within the clinical realm.

Developing a sense of belonging. In addition to the participants' changing relationships with other professionals, the participants had a choice to take up the norms of the profession and develop relationships with those within the profession. As discussed in Chapter Two, an essential aspect of identity development is a sense of belonging; the ingroups and outgroups to which individuals subscribe or feel as though they are a part of (or not) (Tajfel, 1978; Turner, 1975; Tajfel & Turner, 1979). Belonging to social groups serves to encourage the development of shared convictions, attitudes, meanings, and values within the personality layer (Illeris, 2014b). In this instance, it appears to contribute to the solidification of the MLP professional identity.

Significant linkages have been made between discourse and occupational professionalization, as well as professional identity, through a focus on the use of professionalism discourse as a means of socializing employees within crafted occupational identities (Archer, 2008; Beijaard, Meijer, & Verloop, 2004). When we define a specific identity for ourselves, we are fundamentally assimilating (or resisting) ourselves into a discourse (Kouhpaenejad & Gholaminejad, 2014). Throughout the post-practicum interviews, it was evident that the participants had established a sense of belonging or a feeling of having found a

niche within the field that was directly related to their shifting relationships. They identified a sense of feeling as though they were members of the group and were unanimous in their conclusion that they felt welcomed to the community of practice. This finding relates to the idea discussed by Phelan and Kinsella, (2009) wherein belonging to a profession serves a vital component of the greater collective self and one that implies a shift in the identity.

Changes That Did Not Occur

While the preceding sections discussed findings on changes in the participants' MLP identity, this section addresses those identity components that had begun to develop during their didactic training but were not significantly altered (and in some cases were reinforced) through their clinical practicum. This finding involves the participants' views of ideal professional identity and professionalism, as consisting of characteristics of the MLP that they felt were required, appropriate, or desirable.

Before the clinical practicum, the participants had established a loose concept of the ideal MLP. Several aspects of the participants' conceptualization of the 'ideal' MLP identity remained relatively stable throughout the study, including the idea that MLPs must be knowledgeable, organized, should care, have attentional to detail, or have a positive attitude. When questioned about what participants felt were ideal behaviours, many aligned well with those described by the professional attitudes and behaviours section to the CSMLS code of conduct (CSMLS, 2019), as well as those outlined in much of the CNA curriculum. The participants' maintained relatively consistent (pre- and post-practicum) descriptions of what made a good or bad MLP and what constituted appropriate professional comportment.

Unlike fields with a much more robust public image, most of the participants of this study came upon the MLP professional discourse somewhat by accident or because they felt it was a

better fit than nursing. Despite having very little if any understanding of the role, work, and expectations of the MLP workforce before beginning their program, at the point of entry into the pre-practicum interview, they each had established an idea (accurate or not) of what the ideal professional identity was. This finding demonstrates that important elements of their professional identity are formed well before the clinical practicum and that their classroom training is influential in the early stages of their professional identity development. For example, what messaging had they received during their classroom training to create this concept of the ideal professional identity? Notably, during their second and third years of study, the participants' instructors were registered MLPs who can be assumed to have had a relatively developed MLP professional identity. Moreover, the participants' curriculum is, by design, cross-referenced to meet the educational requirements of the CSMLS competency profile.

Thus, given that, upon entering the program, the participants had little personal experience with laboratory medicine, and a limited pre-existing understanding, this research supports the conclusion that the instructors and the curriculum likely served as a significant foundational aspect of their conceptualization of the ideal professional identity. It appears much of the foundation of their professional identity at the initial phase of their program was informed cognitively through their learning as well as through their experiences with their peers in the classroom, providing a base for which transformational learning may occur.

A Model of MLP Professional Identity

The findings of the study regarding changes in the participants' professional identity suggest characteristics of a possible model of early MLP professional identity. Such a model is not available in the literature given the limited amount of research related to the convictions, values, and attitudes that compose the MLP professional identity. Fortunately, Butina's (2010)

work offers a valuable point of consideration in describing the MLP professional identity. Butina proposed several components of the MLP professional identity amongst established MLPs which related to the professional norms and the development of perspectives. These include an understanding of the profession as being vital, misunderstood, and generally unknown.

Figure 5.1 represents the model of the professional identity of the entry to practice MLP following the transformative learning of the practicum that emerged from the findings of this study. It is not intended to be a complete or final representation of it, but an initial plausible way of conceptualizing the attitudes that make up the personality layer of the professional part-identity of the student MLP following exposure to clinical practicum. Thus, it offers a basis for future studies of MLPs professional identity to build on and to develop it further.

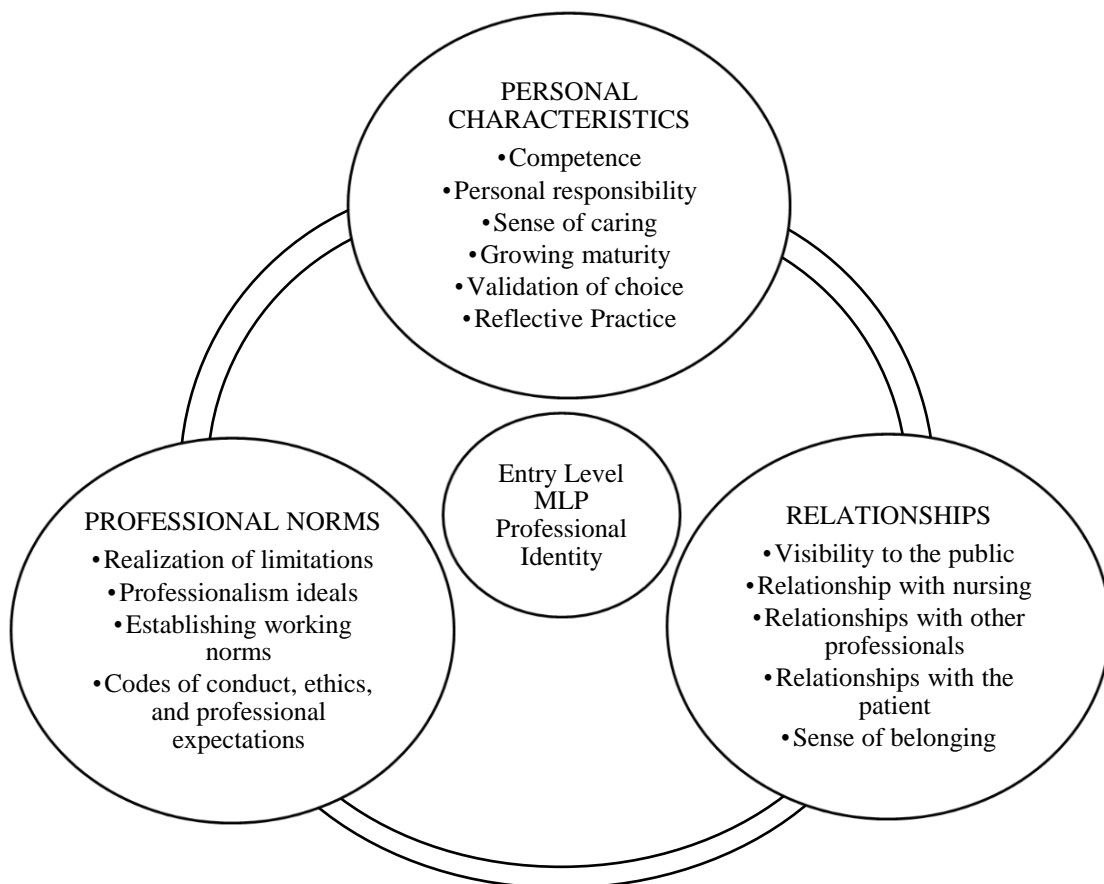


Figure 5.1 Characteristics of the entry-level MLP professional identity

The findings of this research broadly support Butina's (2010) conclusions. Both before and after the clinical practicum, the MLP students had formed ideas and convictions about the field. My research has added to Butina's conceptualization of the MLP professional identity. For example, while all participants within the study had developed a consistent sense of importance or value to the profession—thus confirming Butina's (2010) findings—they struggled considerably with identifying the characteristics that made them health professionals. While there was a limited conceptualization of what constituted a health professional amongst the participants during pre- and post-interviews, participants did indicate a significant sense of frustration associated with insufficient understanding of the MLP from both within the public realm and the health care setting. Once again, a similar finding to Butina's (2010), emerged; that while participants' interpretations of being a health professional were undeveloped, they believed their role should still be visible and understood.

What Supported Transformative Learning?

This section addresses the research question regarding what experiences during the clinical practicum significantly affected the changes in the participants' professional identity. As discussed in the preceding sections of this chapter, these changes suggest that transformative learning as defined by Illeris (2014b) occurred. Thus, the focus of this section is on what experiences supported this transformative learning. My research identified four significant themes regarding these experiences consisting of interactions with patients and the reality of health care; validation of developing knowledge; support from preceptors, and mentors; and embracing reflection.

Interactions with Patients and the Reality of Health Care

A significant finding from the research was the role that the connection to real patients

and their specimens had on the participants' developing identity. This role is related to the transformative learning that occurred. The participants' shift in identity was significantly impacted by those practicum experiences that exposed them to situations with an emotional element. For example, situations such as observing a patient during a cardiac event or seeing a patient's face when they find out they have months left to live, resulted in a form of "reality shock" that influenced their transformation. In this case, the influence can be related to MacCurdy's (1943) psychological concept of "near-miss" and "remote-miss" regarding how individuals who were far removed from the bombing in London during the Second World War internalized these events differently than those close to the destruction. It offers an analogy to the concept of "reality shock" that can come with being close to events that do not fit within pre-existing concepts. Following various events during practicum, participants had to reconsider many of their "remote" (initial) views, convictions, values, and ideas.

Participants witnessed trauma, suffering, and pain of others, which they likely did not fully realize was possible until their exposure (proximity) to clinical practice—a situation that contributed to their transformative learning. It is valuable in discussing this point further, to revisit the experiences of Blaine, Blake, and Jess as they stood out as particularly meaningful, emotional, and clear situations of coming face to face with the reality of patient care that generated personal responses that they did not expect.

Blaine's experience centered on being on-call with one of the supervising technologists and the events which occurred in an emergency room. Blaine described in detail the patient's condition recalling sights, sounds, and feelings in the room at the time and displayed apprehension and a genuine concern for the well-being of the individual. The level of empathy for the patient and the emotional state Blaine appeared to be in, stood out for me, as it contrasted

much of my experience as a MLP. In my earlier years, I had the opportunity to experience similar moments with patients as the participants, but I always remained detached from the human to human connectedness that many participants seemed to exhibit. Moreover, in my years of teaching, I have often tended not to focus on the human aspects of clinical practice preferring to focus on the complex nature of the scientific area in which I instructed. Thus, I view Blaine's emotional response as being counterintuitive, but also insightful, in that MLPs are often taught (perhaps to their detriment) to consider the patient in an overtly scientific manner with a focus on analytic variables and the correlation of these variables with clinical conditions. The experience was an opportunity for Blaine to apply the learning that had occurred within a high-stress environment, but it allowed for a reconsideration of the MLP role and the relationship with the patient. This reconsideration resulted in Blaine obtaining a level of balance between the technical and holistic views embracing the emotional, social, and cognitive dimensions of learning. In this regard, Blaine had moved closer to the middle of Illeris' (2003) learning triangle, and the transformative learning which occurred, appeared particularly meaningful.

In Blake's case, it was a terminal test result and the recognition of its repercussions to the patient that served as a similar learning experience. Over time, skilled MLPs can easily distinguish between non-consequential, pathologic, and even terminal results and are commonly aware of the diagnosis and prognosis of disease well before the patient, and in many cases even before the physician. While all participants referred to reflecting on this in some way or another, for Blake, this realization seemed to trigger considerable thought, reflection, and emotion related to the transformative learning process. For both Blake and Blaine, the transformation was catalyzed with what they considered to be a "it really hit me" (Blaine) moment. This moment for them, observed similarly but less obviously among other participants, was a central event in their

shift in the conceptualization of their role and the role of the field. The participants had to grasp that the reality of their work brought them face to face with mortality. Their work links them closely to patients who are gravely or terminally ill, and that the weight of the knowledge that their actions are significant and meaningful. These moments required them to reframe their ideas and perspectives; ideas, and perspectives that were clearly missing from their classroom experiences. Yet, while the participants of the study viewed these experiences as positive, they have the potential to be profoundly traumatic.

Touching on the potentially traumatic nature of the participants' experiences leading to transformation was Jess's experience regarding a patient who had already died. As discussed in Chapter Four, all participants who engaged in autopsy had complicated feelings around it. These feelings ranged from incredible fascination to being horrified. Jess seemed to be the most personally impacted by the experience, and in many instances, seemed significantly unnerved by the process of an autopsy. Jess used strong language in the discussion of the autopsy and demonstrated an aspect of desire for dignity for the body. Troubled by the experience, Jess expressed a strong sense of empathy for the family of the deceased. Among the participants, it was Jess who also demonstrated the most respect and admiration for those performing the autopsy, indicating a personal inability to perform this work as there would be too much potential for emotional attachment.

Each of these examples of participants' transforming experiences, of which there were many more as noted in Chapter Four, serves to highlight my conclusion that situations involving actual patients in the clinical practicum that generated strong emotions for participants have significant potential for learning and reflection; they are transformative in participants' developing professional identity. This type of learning is far beyond what Illeris (2003) would

categorize as cumulative, assimilative, or accommodative learning, and instead allowed the participants an opportunity to develop qualitatively new understandings of themselves and their positions within the field. Unlike the classroom experience, or experiences involving technical skill development, the learning during these experiences is pulled further towards the center of Illeris' (2003) tension field of learning. That is, they involve a more holistic aspect of the learning processes which necessitates a modification of participants' pre-established meaning perspectives.

Validation of Developing Knowledge

In addition to their experiences with patient care, a second significant influencer emerged relating to how the participants' applied their growing knowledge in both formal and informal circumstances. In many instances, the participants were challenged to use their knowledge both inside and outside the clinical realm allowing them to develop and demonstrate their growing professional identity and alter their relationship with others. This challenge served as a vital point of validation or reaffirmation, which like the experiences with patients, helped catalyze the transformational changes underway.

Throughout the post-practicum interview, it was evident that the participants had become considerably more confident and competent in the technical aspects of the field. All participants described various experiences throughout their clinical practicum, which allowed them to demonstrate their growing competence, and these were significant moments. Some participants, for example, described feelings of accomplishment following the completion of a high-level task such as a complex antibody investigation, while others expressed genuine satisfaction in realizing simple concepts about human pathogens such as being able to distinguish *Pseudomonas*

aeruginosa based on smell. Each participant described experiences within the clinical setting that allowed them to validate their knowledge internally but also to demonstrate this to their peers.

Moreover, each of the participants encountered various forms of technical decision making and having to accept the consequences of their professional judgments. In this regard, participants referred most often to the experiences in which they were given heightened autonomy. It appeared increased levels of independent thinking and work were of particular importance in validating their knowledge; thus, contributing to the transformational change. Several of the stories shared related to having to make such judgments and the demonstration of their growing competence to their peers. Yet, not only were the participants required to demonstrate clinical decisions, but they were confronted with the realization that they would inevitably have to live with and reflect upon those decisions (i.e., another reality shock), thus contributing to the shift in professional identity. In particular, several participants witnessed clinical errors, and the consequences of these decisions triggered significant reflection. The significance of this stood out to me, as it reminded me of the first incident in which I made an error in the clinical environment. The description of these events brought back many of the emotions and reflections that this can invoke. Fundamentally, much like the impact of real patient experiences, the building of confidence and competence, and recognition of the potential for error were a central event in the participants' shift in the conceptualization of themselves within the field.

The validation experienced by the participants was not limited to that which occurred within the clinical realm and was not entirely associated with technical decisions. As was demonstrated in Chapter Four, another finding of the study was how the participants identified with their new role through their external relationships with family and friends, and how these

interactions affected them. Each participant shared a positive experience outside the clinical setting and how they felt about the knowledge they had gained. It is possible that these experiences may have served to temper many of the participants' initial concerns relating to the visibility of the field in the pre-practicum, as it was a moment of recognition for each of them. For example, in sharing their experiences around interpreting requisitions, participants felt the perceptions of their families towards themselves were significant. Therefore, how others viewed them professionally was another important moment in their identity development.

It also is important to recognize that participants had developed comfort in sharing their new-found or growing knowledge base. This comfort with new knowledge extends beyond the instrumental learning associated with the increased technical knowledge and speaks to their positionality within the field and as a presentation of their identity to their family. Once again, these moments of validation provided an opportunity to develop new understandings of themselves and their positions within the field and highlight my conclusion that situations involving the validation of knowledge create significant potential for learning and reflection contributing to transformative identity development.

Support from Preceptors and Mentors.

The third set of experiences affecting the participants relates to the support they received from their preceptors and the socialization processes this fostered. Professional socialization can be understood as the process by which individuals acquire the values, attitudes, interest, skills, and knowledge of a group of which they are or seek to be a member (Merton, Reader, & Kendall, 1957; Waugaman & Lohrer, 2000; Weidman, Twale, & Stein, 2001). Within the participants' MLP practicum, professional socialization seemed to be a relatively unstructured and informal experience resultant from the guidance of preceptor technologists and interaction

with the practice. Nevertheless, it was through their preceptors and mentors that the participants were able to ground many of their learning experiences.

Following their practicum, participants strongly identified with the concept of knowledge and understanding, which was resultant from their exposure to the highly competent MLPs. This conclusion was most evident in the participants' relatively high regard for senior technologists serving as informal mentors. The value of experience on the part of the preceptor was universally recognized, and several of the participants indicated they wished to be (something) that many of the senior technologists were. Each of the participants' shared several stories of how observing and interacting with their preceptors and mentors during clinical practice were valuable points of socializing and learning for them. Furthermore, throughout the interviews, I noted that in each of the most significant events that participants described, a preceptor was present and served as a guiding light in their navigation and reflection of the experience. Ranging from Blake's experience with a terminal diagnosis to Kelly's autopsy experience, to Jamie's self-described mentor in routine hematology, a mentor appeared to be vital for the participants' reflections.

While literature related to the significance of active preceptors is both broad and comprehensive (Johnson, Cowin, Wilson, & Young, 2012; Lambert & Glacken, 2005; Löfmarka, Thorkildsen, Råholmb, & Natvig, 2012; Madavanpraphakaran, Shukri, & Balachandran, 2014), the role MLP preceptors play in the formation of the professional identity is much less explored. For the participants, the identification and influence of preceptors and mentors related to aspects of age, experience, and even focus area within the laboratory environment. All participants accepted the value that the experience of the senior technologists held and had established a level of respect towards them. My research supports the idea that mentorship received is a vital aspect of professional identity development within the participants' curriculum, contributing positively

to the transformational shift in identity that is underway. For the participants, the informal mentorship was crucial as it allowed them to relate to the profession meaningfully, creating in many instances, a sounding board on which they could navigate their ongoing identity shift.

Embracing the Value of Reflection.

The previous sub-sections highlighted the importance of select experiences for the participants' transformational learning. Many of these experiences incorporated an aspect of reflection not yet discussed. Fostering reflection and reflective practices is a common idea in health care professional identity research (Mann, Gordon, & MacLeod, 2009; Wald, et al., 2015). Reflective practices and how to learn from clinical experiences as opposed to broader reflection is a much more focussed approach to health professional education (Mann, Gordon, & MacLeod, 2009). In this instance, it was the participants' broad reflections concerning relationships and their positionality within the field, which served to foster meaningful change.

While the participants had likely engaged in reflective practices related to their technical abilities, during their clinical practicum, they had an opportunity to reflect on their shifting positionality within the field, thus modifying their personal narrative—for example, the beginning transition from student to practitioner. Furthermore, following the practicum, there was a considerable shift in the participants' confidence in their ability to become good MLPs in the future. While a need to be knowledgeable was an important aspect of health care practice consistent across the research, it was the participants' reflections regarding being knowledgeable following the practicum that allowed a realization of their limitations. In many instances, participants identified humility surrounding their realizations regarding their limited skills compared to others. While the participants were considered competent (as relating to the completion of their clinical practicum and its directed curriculum), they had realized that their

learning was far from complete. Further complementing this realization was a growing understanding about the knowledge of their mentors as well as the realization that many of their preconceptions of the field proved different than they expected. Fundamentally, the participants' broad reflections regarding the practice proved influential in shaping their relationship with the field, further contributing to their transformational learning.

Notably, while the participants had embraced the value in reflection during their clinical practicum, within their program, there was little formal focus placed upon the importance of reflection. As I discussed in Chapter Two, most Canadian MLP professional training programs focus specifically on highly technical, workplace-focused tasks with minimal attention placed on any form of reflective practice, and there is little formal consideration of professional identity development outside of limited aspects of professionalism and professional practice. The CNA program the participants completed necessarily developed a curriculum that focuses explicitly on the outcomes required by the CSMLS competency profile. This profile makes only a single reference to reflective practice and one oriented towards technical practice as opposed to self-reflection (CSMLS, 2015).

This lack of reflection within the curriculum raises several questions regarding whether incorporating increased reflective practice and reflection within the CNA curriculum could allow for easier shifts in the professional identity. Most of the participants, for example, identified significant levels of personal struggle when confronted with their emotional responses indicating they may have been ill-prepared for the transformative learning underway.

Summarizing the Influencers.

As I discussed in the previous section, my research supports the conclusion that the transformational learning which occurred was the result of events throughout the participants'

clinical practicum, and transformational learning was not limited to a single event or moment in time. Instead, the shift in the participants' identity was affected by a collective of reflections, experiences, pre-established ideas, and concepts formed throughout the educational process.

Figure 5.2 provides a representation of those factors which contributed significantly to the professional identity development of the participants and serves as a starting point for future research regarding factors influencing MLP professional identity development.

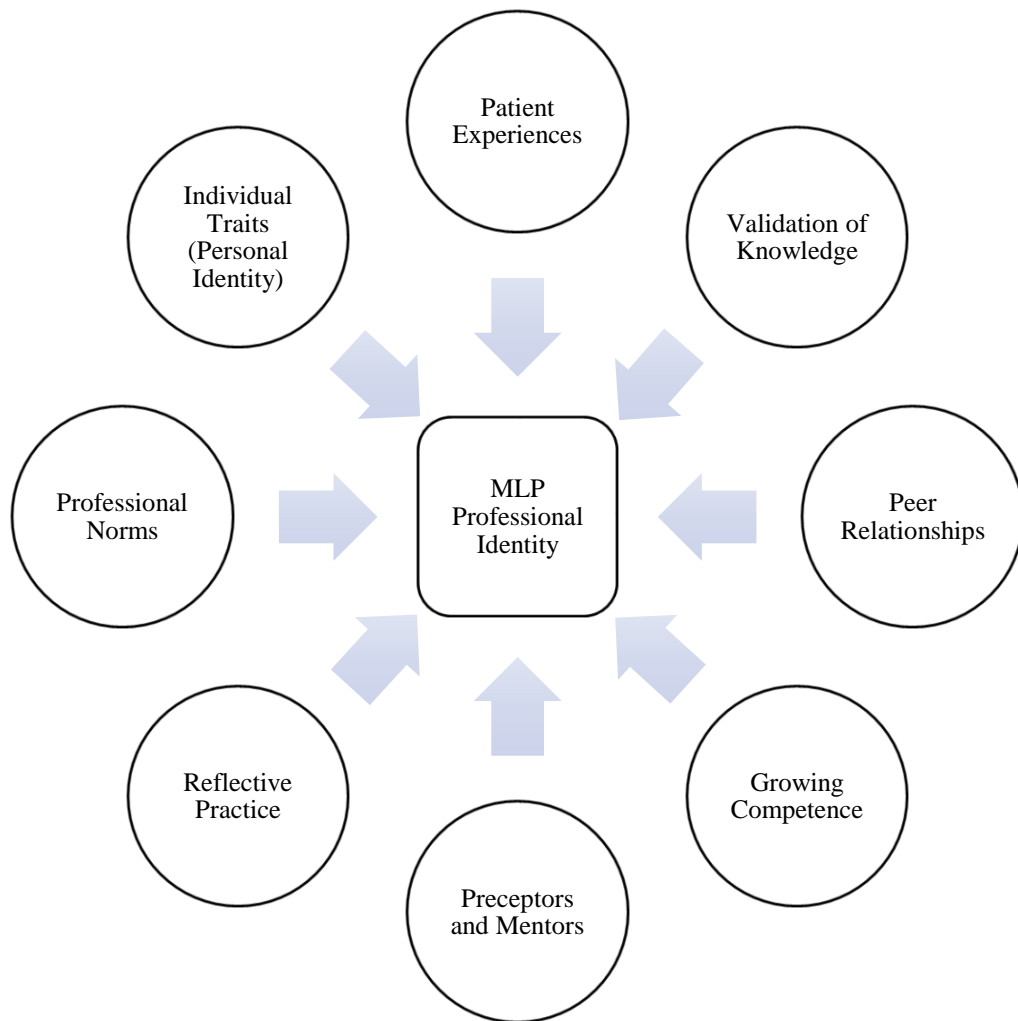


Figure 5.2 Factors contributing to the transformation of the MLP professional identity

It is important to note that the factors indicated in Figure 5.2 are not meant to capture all of those influencers that may have impacted the participant but emphasize those which were

evident throughout the research approach. Furthermore, I consider these factors as primarily contributing to the personality layer of the professional part-identity (Illeris, 2014b), which is transverse and therefore integrated with the central personal identity. Thus, additional factors outside of those highlighted, such as gender, social class, or ethnicity, likely contributed to the development of MLP professional identity but were beyond the scope of this study.

Participants' Shifting Identity in Relation to the Profession

As I have discussed, the participants underwent significant identity shifts and were influenced by several factors. In this final section, I consider the final research sub-question of whether the participants' newly shifted professional identity subscribed to observed, prescribed, or defined professional practices (professional discourse) that exists within the professional environment. Fundamentally, I consider themes surrounding the professional rhetoric that the participants accepted and that which they did not—colloquially, what they *bought into*.

What Did Participants' Buy Into?

Like any profession, within the medical laboratory field, there are established and expected standards of practices that shape the expectations of the individual within the practice. For example, the CSMLS (2019) has established a code of professional conduct that includes aspects of expected professional behaviours. These behaviours, amidst others, include respect for the welfare of the patient, delivery of effective patient care, maintaining high standards of practice, promotion of the profession, knowledge sharing, safe work practices, and responsibility for professional acts (CSMLS, 2019). In many instances, the participants appeared to take up select aspects of the discourse. These include most notably a responsibility to the patient, the concept of ideal behaviours, and competency-based learning.

Responsibility to the patient. The sense of responsibility that the participants had developed concerning the patient was significant as their patient experiences were particularly meaningful. However, it is essential to recognize that MLP literature often emphasizes the significance of diagnostic errors in reference to responsibility towards the patient. This emphasis is perhaps most evident through the recent adoption of the “CSMLS Code of Ethics,” which notes minimizing patient harm, protecting the confidentiality of the patient, and placing the integrity of patients’ results above all else (Canadian Society for Medical Laboratory Science, 2016). As highlighted, a sense of responsibility of which the participants felt towards their patients was evident throughout the post-practicum data, and their changing relationship shows explicit engagement with the ideals located within the code of ethics. In this instance, the participants had taken up the expectations of the profession, through their shifting internal relationship with the patients they had observed.

Ideal behaviours. As previously discussed, there were consistencies across the practicum relating to the concept of the ideal identity—the behaviours of which they felt were required, appropriate, or desirable—and its relation to the codes of professional conduct and ethics. This inquiry identified several consistencies pre and post-practicum relating to the concept of the ideal identity. Throughout their classroom training, participants experienced discourses of which they were able to adopt or resist. As evidenced in the interviews, the participants not only had formed ideas of what they perceived as being good or bad traits within the field, but they had also begun to take up those traits of which they felt were positive. Demonstrating this adoption were their descriptions of their understandings of how they should fit within the ideal.

The participants’ convictions relating to learning from their mistakes, not taking up those traits they felt were negative, and becoming knowledgeable about the field all serve as examples

of how they had taken up the dominant discourse within the professional literature and engaged with their perceived ideal identity. Therefore, this research supports the conclusion that particular aspects of the discourse relating to ideal or what constituted appropriate behaviours were taken up by the participants and incorporated into their professional identity. The participants' ideas of professionalism and what they perceived as less desirable qualities serve as a good example.

Competency-based learning. While the previous two aspects of the professional discourse are well represented throughout the chapter, less discussed were the participants' views regarding the role of competency-based learning. Illeris (2011b) posits that a meaningful sense of competence in working life is a deeply integrated element of the identity as it is this feature that affords a worker the ability to confront evolving and unforeseen problems of practice. Moreover, for Illeris (2014b), being competent not only involves being professionally qualified but also being personally committed and able to vouch for how one acts and reacts relating to the objectives involved.

In line with this idea, the participants often emphasized how they sought out learning activities that allowed them to engage with their work and demonstrate their competence. The MLP field is structured towards competency-based learning, and as such, it is valuable to consider if and how the participants took up a competency-based model of learning. In line with this, Miller (1990) proposed a pyramid style approach relating to competency-based learning, which consists of the layers, *knows*, *knows how*, *shows how*, and *does*, each relating to the assessment of the practitioner as competent. Recently, Cruess, Cruess, and Stenert (2016) proposed an amendment to Miller's (1990) work—one relevant to this research—including the addition of "Is" at the top of the pyramid, concluding that the development of professional identity is something that can be not only measured but directly assessed. Given Illeris' (2014b)

emphasis on the role that the work identity has on the individual and the importance of said work identity, this research supports this is a valuable addition and one that relates to the participant's engagement with the MLP professional discourse.

Near the end of the practicum, the participants had begun to take up the discourse of the profession and had begun to develop the sense of "I am" discussed in the amended Miller's pyramid (Cruess, Cruess, and Stenert, 2016), as evidenced by their sense of belonging to the field, and their engagement with aspects within the professional rhetoric. Moreover, this conclusion is supported by the participants' recognition of their growing competence as they considered their competency-based learning as highly relevant to them.

What Did Participants' Not Buy Into?

While it was evident that several aspects of the discourse of the profession resonated strongly with the participants, discourses can also be resisted. As such, there were other ideals within the literature of which the participants did not appear to engage. In most cases, this did not appear as active resistance, but an indication of what did not resonate with the participants. In this regard, two key areas that were informed by my role as an MLP educator and practitioner stood out to me, consisting of a sense of responsibility outside of the patient and aspects of regulation and quality culture.

Responsibility outside the patient. The clinical practicum experience impressed upon the participants the importance and value of their work. Positive perspectives relating to the work included those related to teamwork, other professionals, and even their peers. Though the participants had taken up the responsibility towards the patient in earnest, it was less clear if the participants felt any responsibility towards other aspects of the practice, as discussed within the

code of ethics such as contributing to the development of the profession or professional comportment.

As noted earlier, within the professional literature/regulatory publications, particularity the code of ethics, a sense of responsibility towards the patient is emphasized. Aspects of responsibility within the literature are also tied to aspects of legality, regulatory culture, and institutional authority (CSMLS, 2005, 2015, 2019). Even when discussing mistakes, the participants made little reference to legal implications, regulatory bodies, or even institutional policies. These seemed to carry little significance to them, and this was unexpected given the recent regulatory trends in NL. On the contrary, throughout the post-practicum interview, I expected that these oversight processes would emerge as significant due to their ubiquity in the NL clinical environments. Instead, it appeared that each participant had internalized or taken up the mantle of responsibility independently and for reasons outside of the institutional authority. It was the emotional connections with patients and their sense of identity development, which motivated the participants' sense of responsibility. As an educator within the field, for me, this finding raises several questions surrounding whether the current professional discourse literature, as well as aspects of the contemporary MLP curriculum, accurately reflects what responsibility means to those engaged in clinical practice.

Regulation or quality culture. Another area in which the participants' developed professional identity deviated from that outlined in the literature relates to aspects of professional regulation, quality culture, and continuous learning. The CSMLS notes one of the most important aspects of professionalism within the MLP field is the need to meet the legal and ethical requirements of practice and protecting patients' right to a reasonable standard of care (CSMLS, 2019). Primary manifestations of this include compliance with legislation, recognition of

limitations, participation in continuous learning, and maintaining quality care. In my experience, aspects of quality control are a critical component of the required technical skills and are ingrained in much of the formal learning. Furthermore, attention to quality management and quality control over the last decade in NL that resulted from the commission of inquiry on hormone receptor testing has been overwhelming as this event triggered the regulatory and continuous learning mandate, which remains in place today (Cameron, 2009; Hardy 2013).

These points did not manifest significantly within the research. For example, I expected aspects of testing accountability and quality assurance would emerge within the data, as these two points comprise a substantial aspect of the discourse of the medical laboratory profession related to both regulation and continuing professional education. Regulation, continuous learning, and quality seemed to be a secondary concern within the participants' interviews, and the language of quality barely registered outside of testing quality control errors. This finding is particularly important as significant attention over the last decade has focused on developing processes and curriculum to address quality (such as quality management) within the laboratory (CSMLS, 2005, 2015). Moreover, substantial modifications to the CSMLS competency profile which emphasize quality processes have emerged. Thus, while participants had developed skills associated with quality in the context of the laboratory practice (as evidenced by their growing competence and reference to the significance of errors), the authorized discourse about quality was much less significant to the conceptualization of their own professional identity.

Implications for Medical Laboratory Professional Education

The study demonstrates that following their clinical practicum, the participants emerged from the clinical realms with significantly more developed professional identities. Evident changes included shifts in the personal narrative, solidification of their role and positionality, and

the development of new ideas and perspectives. I consider these and other changes as marking a significant shift in their identity. Thus, using Illeris' (2014a, 2014b, 2014c) interpretation, transformative learning did occur and was encouraged through several categories of experience. Yet, this process did not occur without a significant level of personal struggle, including a mixture of strong conflicting emotions which incorporated into the participants' identities. This conclusion(s) leads to several key considerations within the MLP professional landscape, particularly for simulation learning, the structure of clinical practicum, and the importance of the validation of the participants' knowledge during the practicum.

In recent years, there has been considerable focus placed on the role of simulated clinical education as a means of reducing the time required for clinical competence. Recent arguments have even questioned whether clinical simulation could completely replace clinical education (CSMLS, 2020). While there are clear benefits to clinical simulation, this research supports the holistic role of the clinical practicum. It would seem highly unlikely that simulated environments would be capable of replicating the emotional dimension of learning that students are exposed to in clinical practicum. While attempts to increase clinical simulation may serve to benefit the technical psychomotor skills that could be developed, this research supports the conclusion that any attempt to make this the sole context of experiential learning may limit the significant and largely positive transformational learning which occurs.

Moreover, this research makes it clear that one of the most significant events in the clinical practicum was the interaction with patients. This finding is a particularly important aspect as formal MLP education approaches often minimize (through curriculum) the potential for direct patient care. Laboratories are often sequestered from patient care areas of health care environments, and MLPs, particularly those in large urban laboratories, may have limited

interaction with other professionals or patients during their formal training. Within this research, I concluded that one of the most significant aspects of learning which occurred centred on the development of a sense of the connectedness between the practice and the lives of patients. Thus, future endeavours in planning educational activities for MLPs should strongly consider ensuring interaction with patients and other health care professionals.

Additionally, the role of the preceptor should be taken into greater consideration. For example, within the participants' curriculum, there is a structured focus placed upon the role that preceptors' mentorship played within the clinical environment regarding the professional socialization process. Yet, there is currently no robust formal training process in place within CNA or through the CSMLS by which to encourage preceptors to engage in mentoring processes. While there is a degree of richness captured through interaction with in situ practice, given the significant value placed by the participants on the informal mentor, it may be beneficial to explore or at least attempt to quantify formal mentoring as it occurs in clinical practice. This suggestion is not to imply the replacement of the in situ practice, merely that there may be a benefit in expanding into more formalized student-mentor relationships and that there may be a role in developing curriculum for student mentors.

Finally, the research brings to the forefront the voice of the MLP student, which has practical implications for their professional education program. As was previously discussed, there are significant limitations in MLP curriculum (both within the participants' program and nationally) relating to student professional identity development. This research brings forth the first perspective on how students in MLP programs make sense of their professional identity, and I have proposed two models that may be utilized in MLP training programs to aid professional identity development. These models have implications both from the perspective of the MLP

educator, who may use the proposed models in structuring educational activities—for example, incorporation of aspects of reflection within the classroom environment—but also for the MLP student. As was demonstrated within the pre-practicum findings, MLP students enter the field with limited understandings of the profession, and this research may serve to provide a conceptualization of their professional identity to serve as an anchoring point during their learning.

Suggestions for Future Research

As a case study, this study provides a basis for further research to build on and extend aspects of it regarding the findings. In particular, the characteristics of the entry-level MLP professional identity (Figure 5.1) and the factors contributing to the transformation of the MLP professional identity (Figure 5.2) are initial theoretical models that are informative to the field but also require further investigation to lead to further verification and generalization for the field. Much work remains to be completed within this largely unknown group. In particular, further research is needed:

1. To explore methods to encourage more robust professional identity development in MLP students.
2. To determine how the professional identity continues to evolve, particularly within the first year of practice, once individuals have become fully engaged within the profession as full-fledged MLPs.
3. To explore how this developing professional identity becomes more nuanced throughout the first year of practice or longer, as well as explore more nuanced aspects of the developing professional identity of entry-level practitioners as their training in the field becomes refined.

4. To explore how individual biographical, social, and cultural factors, which are important elements of the central personal identity (i.e., gender, class, ethnicity), affect the development of the professional part-identity.

Moreover, future studies might also focus on developing greater insight into how educational practice can encourage this transformative process at both the classroom and practicum level in MLP education program. Studies relating to the role of the preceptor or mentor within the clinical practicum environment are also needed as well as those focusing on how these professional relationships develop and impact MLP identity or as to what practices can be encouraged to continue to foster transformative change.

Concerning these and other areas where research is required, Illeris' (2003, 2011a) contributions to general and workplace learning from a holistic perspective may prove useful, and future research should explore more fully the social and emotional dimensions of the learning associated with the developing MLP professional identity. Moreover, in this instance, it may also be worthwhile to consider the work of Peter Jarvis or Etienne Wenger, whose work can be considered in complement with that of Illeris, particularly as it relates to identity development and social learning theory.

Finally, though it is beyond the scope of this study, there are a number of implications embedded within the analysis that link to aspects of commodification of learning and industrialization of the profession, particularly around the professionalization of the field. I am reminded, for example, of the participants' insights into employment aspects and workplace culture, as well as broader understandings of competency and skills discourses. As the ML field is undergoing a significant professionalization process, one similar to that which was experienced by nursing, there are a number of critical factors that require further exploration.

Future research could explore the professionalization of the ML field, as it is underway, and may benefit from the application of a critical theorist lens in exploring factors such as political influences within the field, neoliberalism's influence, how the feminized nature of the field impacts professional identity, or how the culture within the field affect the professional socialization of its members. Moreover, some of the disconnect I experienced between how I viewed my experience as an MLP student and how some the mostly female participants viewed theirs, could indicate possible gender differences in our interpretation of similar clinical experiences. Thus, future research should also consider identity in relation to gender to address implications for professional identity.

Limitations of the Study

Case study research is a creative and credible approach to underpin contemporary practice, and its prior use and reputation of the method lend credibility to the findings of this study (McGloin, 2008). According to Yin (2014), single case designs are particularly well suited to case study when exploring a phenomenon at different points in time. Nevertheless, this study and its method were subject to several fundamental limitations. For example, Yin sees the absence of systematic procedures for case study research as a significant concern. This research was a fluid and iterative process, and one which evolved through time and thus, the lack of rigidity within the method, though allowing for organic exploration, does raise concerns around generalizability, and therefore conclusions must be carefully drawn. Throughout the study, I have attempted to reflect on my own experiences as an MLP educator and practitioner and have carefully considered this throughout the research.

A significant limitation of the study was the omission of the role that gender might have played within the analysis. While it was necessary to remove references to gender to protect the

confidentiality of the participants, this prevented a robust exploration of how the gendered lens of the participants may have affected the professional identity development. Given that Grant's (2005b) work concluded that gender played an important role in shaping the ML profession during its history, the research would have benefited from the incorporation of a gendered lens. This notion is particularly true as I have experienced the profession and constructed my own professional identity from the perspective of someone who identifies as male. Future research should apply an additional lens of gender to the development of professional identity.

Secondly, the study focused only on a single cohort of CNA MLT students educated through a contemporary curriculum in NL. As noted earlier, most CNA students in the MLT program have historically fallen within a very narrow demographic. In my experience, students are typically white, female, in their early to middle twenties, of variable socioeconomic status, and have spent their formative years within NL or Atlantic Canada. This study sample was broadly representative of this demographic, and thus conclusions must be drawn from within this frame of reference. During my own MLT training, I myself, apart from identified gender, fell mostly within this demographic

A further limitation within the research, which created a potential ethical concern, related to the interviewing of former students. Each of the participants within the study was an individual of whom I had once been in a substantial position of power. While I made clear that I had removed myself from any potential influence on their progression, student teacher power dynamics are enduring. Moreover, I have and continue to hold leadership roles within the medical laboratory community, both provincially and nationally, and as such, concerns arise regarding whether the participants responded how they felt they should.

It must also be noted that the population studied was largely culturally homogeneous. Within the analysis, there is little consideration for culturally distinct ways of being or knowing, and the research looks only from the lens of the homogeneous population. Moreover, I was unable to conduct member checks with the participants due to practical limitations of the participants. The research is Eurocentric and looks only through a western understanding of post-secondary education processes. Additionally, a significant gender imbalance occurred due to the average enrollment and demographics of the medical laboratory profession, along with limited multicultural representation in NL.

Additionally, the research is focused on a small geographical location and explores identity and learning from the described theoretical framework. That is, identity and identity components such as professional identity, are composed of a layered concept including the core, personal, and preference layers as described by Illeris (2014b), and wherein identity development is a learning process that unfolds as individuals engaged in lived experiences. The analysis of the data predominantly considers identity and identity transformation from within Illeris' personality layer of identity and focuses accordingly. Moreover, it is important to recognize that Illeris' (2003a) model of learning incorporates only three dimensions of learning, yet, there were aspects of the participants' experiences which hinted at other dimensions not necessarily captured within Illeris' (2003a) framework, particularly aspects of embodiment (Lawrence, 2012; Kelly, Ellaway, Scherpbier, King & Dornan, 2019). Thus, Illeris' model may require expansion to include additional elements of learning not necessarily captured within the existing dimensions.

Finally, the research focused on clinical practicum as a specific intervention for learning. While I consider this particular window in the time of the participants' identity development, I acknowledge and understand identity development as a continuous process. Moreover, the

research focuses on professional identity as one part-identity amongst many and considers this professional identity as profoundly interconnected with the personal identity. It is, therefore, essential to acknowledge, understand, and accept that for each individual, any number of individual part-identities may serve to influence their developing professional identity.

Conclusion

Nearly every Canadian will, at some point, require the services of an MLP. Often referred colloquially amongst its occupants, laboratories are the diagnostic engine room of the hospital. Operating rooms, oncology suites, surgical floors, emergency rooms, and even private clinics rely on the work of the MLP. Yet, the reality is that most Canadians are largely unaware of the practitioners, and as such, explorations about those who perform these necessary diagnostic tests remain limited.

This research is a start. It points to the significance of clinical practicum in shaping the professional identity, a learning experience that is difficult to understate, for any health care profession. During the clinical practicum, MLP students experience the profession and its practice first-hand and in ways that are profoundly meaningful in fostering transformational learning. This transformation occurs, in part, to a significant shift in the professional identity of the medical laboratory student during crucial events ranging from experiences with patients to experiences with an autopsy, to the changing relationships with their peers and other professionals. Fundamentally, the clinical practicum allows for an opportunity for MLPs to reconsider their positions with the field and the view of the profession and serves to influence the developing personality layers of the professional self.

Nevertheless, gaps remain in understanding how the professional identity of the MLP continues throughout the MLP career, how it ebbs and flows, and research is required to explore what contributes to its continued development. While limited research has been conducted to both explore and define the identity of its practitioners, MLPs remain unknown. This research has begun to shed light on this misunderstood professional group and, most importantly, how their professional identity develops throughout the learning intervention of clinical practicum.

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Appendix 1: Pre-Practicum Interview Protocol

1. Thinking about your family, childhood memories, any family links to the laboratory profession, or health care in general, tell me a story about yourself?
 - a. Who are you, and why did you choose to enter the ML profession?
 - b. What made you interested in entering health care?
 - i. Did you always feel this way?
2. Thinking about your life before the program, has anything changed about the way you see yourself in the last two years?
 - a. If so, can you talk a little about this change?
3. Tell me a little about your educational experiences in the MLP program so far.
 - a. How do you feel about your time in the MLP program?
 - b. Tell me about a memorable experience in the didactic program that you enjoyed, why was it memorable?
 - c. Tell me about an experience in the didactic program you didn't enjoy and what it was that made it unenjoyable.
4. Thinking back to your first year just before you entered the program, can you tell me about your view and understanding of the ML profession? For example:
 - a. How did you know this is what you wanted to do?
 - i. Did you always feel this way?
 - b. When people asked you what you were going to do in school, what did you say then?
 - i. What response did you get from them? How did that make you feel?
 - c. When people ask you what you are doing in school now, what do you tell them?
 - i. What response do you tend to get from them? How does that make you feel?

- d. Tell me how you would describe your chosen field today to a complete stranger?
5. What does being a medical laboratory professional mean to you? For instance:
- a. What is a MLP to you? For example, how do you think they are perceived by patients?
 - b. Tell me a little about how you see yourself as an MLP?
 - i. What about how you want others to see you as an MLP?
 - ii. How do you not want others to see you as an MLP?
 - c. What do you think makes a “good” MLP?
 - d. What do you think makes a “bad” MLP?
6. Thinking about yourself and your future career as an MLP:
- a. What do you think is the most important thing that you do?
 - b. How do you feel about the role MLPs play in patient care?
 - c. How do you think patients and the general public feel about MLPs?
 - d. What does quality mean to you?
 - e. How do you feel when someone refers to you as a laboratory technician?
7. How do you see yourself as a future health professional?
- a. What does being a health care professional mean to you?
 - b. Tell me about what makes you feel as though you will be a “good” future MLP?
 - c. Based on your life experiences, do you feel like you belong in the ML profession?
 - i. What qualities do you think make you feel this way?
8. How do you feel overall about the ML profession?

9. Thinking about your life outside of work and school, how does being an MLP fit into the way you see yourself?
10. How do you see your role in your development as an MLP?
11. What learning style or approach do you think is best suited for you? What about for others going through the program?
12. What would you change about the didactic program if you wanted to make it match to how you learn?
13. How confident are you now about being an MLP and your choice to enter the field?
 - a. Do you feel that you made the right choice? Why or why not?

Appendix 2: Post Practicum Interview Protocol

1. I would like you to start by telling me about your clinical practicum.
2. You are about to finish your program, so when people ask you what you are doing in school, what do you tell them? How do you describe your chosen field?
3. Tell me a little about what being an MLP means to you? Thinking about your clinical experience:
 - a. What do you think makes a “good” MLP?
 - b. What do you think makes a “bad” MLP?
 - c. What makes you a “good” MLP?
4. Thinking about your life before the program, has anything changed about the way you see yourself since January? If so, can you talk a little about this change?
5. Thinking about yourself as a MLP, what do you think is the most important thing that you are going to do?
6. How do you see yourself as a health professional?
7. Thinking about teamwork and health care teams, how do you feel the MLP fits in the greater health care team?
 - a. Were there any experiences during the practicum that made you feel this way?
8. How do you feel overall about the ML profession now that you have completed the practicum and are about to start working?
9. Thinking about your life outside of work and school, how does being an MLP fit into the way you see yourself now that you have been in the hospital setting?
10. Tell me a little about your practicum experience
 - a. How do you feel about being an MLP so far?

11. Tell me a story about your experiences on clinical practicum.
 - a. What was the best experience you had on your clinical practicum?
 - i. What made it so memorable?
 - ii. How did this experience make you feel about the ML profession?
 - b. What was the worst experience you had on your clinical practicum?
 - i. What made it so memorable?
 - ii. How did this experience make you feel about the ML profession?
 - c. Were there any experiences that made you think differently about your role and future as a MLP?
 - i. If so, can you tell me about them?
 - d. Were there any experiences that made you feel like you belonged as a MLP?
 - e. Thinking about the people you worked with on clinical practicum, were there any experiences that made you think about the profession as a whole?
 - i. Tell me about them.
 - f. Were there any experiences on your practicum that you felt had a lasting impression on you?
 - i. Tell me about them, what made them so unique?
 - g. Thinking about your clinical practicum, were there any experiences that made you pause and reflect on who you are and why you entered this field?
12. Thinking about your practicum experience:
 - a. Has anything changed about the way you see yourself?
 - b. What about your view of the MLP?
13. What was different about the practicum from the classroom training you had?

- a. Outside of the technical areas, tell me about how you learned during the practicum?
 - b. Where do you think the bulk of your learning occurred?
 - c. Were there any influencers on your learning?
14. Thinking about your practicum experience in relation to the CSMLS competency profile:
- a. How do you feel about your own learning approach?
 - b. Did this mesh well with the expectations during the clinical practicum?
15. During your practicum, were there times when you felt part of the group? If so, how did this make you feel? If not, did you feel comfortable with the working group?

Appendix 3: Recruitment Material



3rd YEAR MLS STUDENTS NEEDED FOR RESEARCH STUDY ABOUT PROFESSIONAL IDENTITY

**I am looking for volunteers to take part in a study entitled:
“Exploring Professional Identity in Medical Laboratory Science Students in Newfoundland
and Labrador.”**

As a participant in this study, you will be asked to participate in two interviews with the researcher to explore your time as a medical laboratory student. The study seeks to understand more deeply the role that clinical practicum has within contemporary medical laboratory professional education programs and to develop a deeper understanding of the ways in which medical laboratory professional students make sense of their professional identity.

The study involves the completion of two 30-45-minute semi-structured interviews with the researcher: Once before or early in your clinical practicum experience and once following the completion of your clinical practicum.

Questions will be open-ended in nature and seek to explore the general themes of:

- 1. Exploring identity formation of MLP students**
- 2. Experiences students have that shape their identity**
- 3. Ways of knowing/learning**
- 4. Professional Self-Identification with the Group**

If you agree to participate, the researcher will provide you the option of audio recording the interview for further detailed analysis or take notes without audio recording, but all information will be held in strict confidence, and your responses will be securely protected by the researcher in accordance with established ethical guidelines. While audio recording of the interview is preferred, it is not required. You will also be given a pseudonym of your choice to protect your identity.

Your participation in this proposed research, while much desired and much appreciated, is strictly voluntary. Participation has no impact on your progression through your program as the researcher is completely removed from any and all grading components within your program. Participation, or lack thereof, is not a requirement of your program and will not be reported to

anyone at CNA. This study is being conducted as a graduate research project at the University of Calgary, and data will be used in the development of a doctoral dissertation. This study is affiliated with the University of Calgary and is not affiliated with the College of the North Atlantic.

Participation carries with it no significant risk of harm and will serve to enrich the limited body of research around the medical laboratory profession.

For more information about this study, or to volunteer for this study, please contact:

Greg Hardy
University of Calgary – Werklund School of Education
ghardy@ucalgary.ca

**The University of Calgary Conjoint Faculties Research Ethics Board has approved this research study.*

**This project has received secondary review and approval on behalf of College of the North Atlantic by Memorial University's Interdisciplinary Committee on Ethics in Human Research (ICEHR)*