

# **Professional identity formation in Medical Laboratory Technology students**

**by  
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Project Submitted in Partial Fulfillment of the  
Requirements for the Degree of  
Master of Education

in the

Educational Leadership Program  
Faculty of Education

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SIMON FRASER UNIVERSITY  
Summer 2022

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## **Abstract**

The body of work around professional identity formation (PIF) in healthcare is expanding rapidly, however, little has been published that is specifically concerned with Medical Laboratory Technology (MLT). PIF is an ongoing process where students come to think, act, and feel like a laboratory technologist. MLT graduates are expected to have made the transition from a student identity to that of a healthcare professional, with the incumbent responsibility for patient care. This study addressed the existing knowledge gap with an exploration of how students in one MLT cohort experienced the development of professional identity. Data from seven semi-structured interviews and 11 reflective journals was analyzed qualitatively for emergent and conceptual themes. The results demonstrated evidence of PIF in all participants and identified factors that both contributed to and limited the process. In addition, students described how they experienced and resolved varying degrees of identity dissonance or professional challenges.

**Keywords:** professional identity; medical laboratory; healthcare professional; healthcare education

## **Dedication**

This project is dedicated to the many hardworking and creative medical laboratory technology students that I have had the privilege to instruct.

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## List of Acronyms

PIF	Professional Identity Formation
MLT	Medical Laboratory Technologist
CNC	College of New Caledonia
SDT	Self Determination Theory
IPT	Identity Process Theory

# Introduction

Students enter a healthcare professional program like medical laboratory technology (MLT) with an established personal identity. To be successful in the program and in the workplace, they are required to integrate the ethics and social norms of their intended profession into that personal identity. The naming and understanding of this process as professional identity formation (PIF) has only recently been a focus for healthcare education programs. While there is body of literature addressing PIF from a physician perspective, fewer studies have focused on other allied healthcare professions.

MLT is a profession that is not well understood outside the walls of the laboratory. There is a lack of awareness, on the part of the public and other healthcare professions, of what a laboratory professional actually does (Butina & Schell, 2011). In contrast to medicine or nursing, the MLT role in the healthcare process is hidden and MLT students have less contact with patients or other healthcare professionals, even during clinical rotations. As a result, understanding of their fundamental role in the patient's wellbeing, and their place in the healthcare team, can be problematic and students can struggle to make the connection. This presents unique challenges to MLT students in regard to PIF, positioning it as an important consideration in a MLT program. Upon certification, students become part of a profession that requires a high level of commitment to a patient-centered, and structured approach. This commitment is vital to the quality of patient outcomes. Although the laboratory's contribution to care is less visible to patients, 70% of clinical decisions are based on a laboratory generated value (Forsman, 1996). As a result, patients are best served when the healthcare professional is intrinsically motivated and professional behavior goes beyond mere adherence to the rules – when it becomes internalized and part of their identity. According to Gregory and Austin (2019):

In the context of the complexity of day-to-day work that requires ethical reasoning and application of clinical judgement, incomplete professional identity formation may result in behaviors that are suboptimal, ranging from unwillingness to make appropriate decisions and take responsibility for them, to staying silent in the face of a difficult choice due to lack of self-confidence or belief that one's opinion matters. (p. 50)

Hearing students' perspectives and experiences as they integrate new concepts and norms into their existing personal identity, is foundational to the development of intentional curriculum for promotion of PIF in healthcare education. How they, as individuals, identify what shifts in identity are necessary and negotiate the revisions is the subject of this study.

As researcher, it is important to note that I practiced as a MLT for over 30 years and have been an educator for 5 years. Involvement in both arenas, healthcare and education, brings with it certain insights as well as preconceptions. The framing of this research is inevitably influenced by my personal experience in establishing a professional identity as a MLT and in reshaping it to include educator. This experience has led to my interest in the topic and the formulation of the research question - how do students in a college MLT program experience the formation of professional identity and the transition from student to healthcare professional?

# Literature Review

A recent concept analysis by Fitzgerald (2020) revealed the diversity among healthcare researchers in regard to the definition of professional identity. After a systematic review of 60 articles, the analysis identified five main attributes of professional identity – actions and behaviors, knowledge and skills, values and ethics, context and socialization and group and personal identity. Clearly professional identity is a complex concept that is difficult to succinctly define. The difficulty lies in the complexity of the underlying construct of personal identity and how it is influenced by social context. Adopting a simple definition such as “coming to think, act and feel like” (Merton, 1957, as cited in Creuss et al., 2014, p. 1447) a part of the profession may be the most practical when exploring student experience.

Historically the focus in healthcare education was on *acting like* and the teaching of professionalism and behaviors that are expected (Sawatsky et al., 2020). This is evident in the MLT program where we teach confidentiality, communication skills, teamwork, ethics, and a code of conduct. Recently the focus of healthcare education literature has shifted from concentrating on behavior to questioning what is happening internally for the individual – the *thinking and feeling like*.

Creuss et al. (2014) proposed reframing medical education toward the supporting of professional identity formation, and the understanding of its psychological development as the logical first step. While it is still appropriate for a healthcare program to teach professionalism fundamentals, with the growing awareness of the concept of professional identity, professionalism should be viewed as a “means to an end” (Creuss et al., 2014, p.1).

## Conceptual Framework

The question is how can professional identity be understood and facilitated in healthcare education and more specifically, in a MLT context? There are numerous theories that are relevant to a discussion of professional identity and its formation. The conceptual framework created for this study is based on two theories that describe the ongoing formation and evaluation of personal identity and the factors that serve as

motivators for engagement and change – identity process theory and self-determination theory.

## **Identity Process Theory (IPT)**

Identity process theory (IPT) outlines how life changes - like embarking on a new career - can cause us as individuals to “rethink who we are, our relationships with others, and how we ought to behave in particular contexts” (Jaspal, 2014, p. 3). Students coming into a professional program will bring with them the sum of their experiences to-date, and a sense of who they are in themselves and in wider society. This comprises their personal and relational identity (Vignoles et al., 2011). Fundamental to IPT is the belief that individuals have agency in the creation of their identity and are capable of evaluating and making revisions to it when required.

IPT states that the structure of identity is comprised of two parts: content and values. This structure is not fixed. Content and values are responsive to social context and revision attempts on the part of the individual (Jaspal, 2014). Individuals are continually engaged in a process of constructing identity through two means – evaluation and assimilation. Each new experience is interpreted in relation to the existing identity and evaluated. The experience may validate the existing identity or may challenge its validity (Breakwell, 2014). Validation occurs when the new information satisfies basic needs and is complementary to existing identity rather than conflicting with it (Amiot & Jaspal, 2014). The basic needs driving the processes of evaluation and assimilation are the motivational desires for continuity, distinctiveness, self-efficacy, and self-esteem. Social representations of a profession also play an important role in PIF as they “allot meaning and value to experiences” (Breakwell, 2014, p. 118)

When a new professional value is dissonant with - or foreign to - existing self-concept individuals may feel threatened. While individuals consciously choose to evaluate and adjust aspects of their identity, response to threats may be unconscious (Vignoles et al., 2011). This will result in the adoption of some kind of cognitive coping strategy (Jaspal, 2014; Os et al., 2015) such as re-conceptualization of the issue or prioritizing one identity over the other. For healthcare professionals, errors can often be a threat to identity because “errors are incongruent with their professional ideals” (Os et al., 2015, p. 1013). The potential for identity dissonance arises for students when their

existing identity is not validated but threatened by a professional norm or experience. Creuss et al. (2014) suggested medical program admission procedures be redesigned to select the candidates that already possessed the requisite qualities for the profession, thereby limiting dissonance.

## **Self-determination Theory (SDT)**

Understanding the process of identity revision is only part of the story. It is also important to consider the motivation and will to do so and while IPT addresses this, self-determination theory (SDT) is a succinct and workable explanation of intrinsic motivation. “SDT elaborates on how humans tend to internalize regulation of behavior that initially has been external, in order to develop autonomous, self-determined behavior” (ten Cate et al., 2011, p. 961).

In this way SDT addresses the process of integration that occurs when students are introduced to the codes of conduct, behavior and attitudes that are expected in laboratory work. In the beginning, professional expectations are externally imposed as part of the curriculum, such as the MLT requirement for attention to detail or safe work practices. Gradually the professional norm is assimilated into the student’s identity so that attention to detail is self-determined. Mylrea et al. (2017) argues that SDT is an excellent working model for the development of PIF curriculum in a healthcare professional program.

As in identity process theory, SDT posits that humans are naturally inclined toward growth that leads to a cohesive sense of self. That growth is influenced, positively or negatively, by internal and external factors (ten Cate et al., 2011). SDT proposes that there are three fundamental human needs – autonomy, competence and relatedness. The meeting of these needs facilitates growth and integration (Ryan & Deci, 2000).

Autonomy describes the need to be the source of one’s own actions and the need for agency or choice. Competence is the desire to feel capable. Relatedness addresses the social aspect of intrinsic motivation in the desire to be connected to others (Ryan & Deci, 2000; ten Cate et al., 2011). Together these motivators lead to the development of the individual and relational components of identity.

The conceptual framework (Figure 1) for this study utilized a blend of these two theories - IPT to outline the structure of identity and give insight into the revision process and SDT as a succinct, yet comprehensive explanation of the motivational factors involved in the ongoing development of identity.



**Figure 1 Conceptual Framework**

Conceptual framework utilized in this study. SDT driving factors of autonomy, competence and change provide the impetus for revising one’s current identity. The process of change is drawn from IPT. The need for change in content/values is evaluated against current personal goals (motivations) and the social representations of the profession. If current identity is validated by the update it is assimilated into professional identity. If the update is dissonant with existing identity it may be compromised or wholly rejected.

## Healthcare and PIF

The body of knowledge around PIF and medical laboratory professionals is sadly lacking. A search of the data base CINAHL Complete, and using the keywords *professional identity* and *formation* yielded approximately 200 results. Including the phrase *laboratory* reduced the results to zero. By expanding the search to keywords *laboratory* and *identity*, two articles were found that related to professional identity and medical laboratorians. The majority of the literature around PIF centers on medicine, followed by pharmacy and nursing and a smattering of other allied health professions, such as occupational therapy, and physiotherapy. Studies were chosen for review based on their relevance to the research question and transferability to a MLT perspective.

The two studies that included MLT data demonstrated the unique challenges of PIF in this particular healthcare field. The first was a qualitative study that examined professional identity in relation to recruitment and retention, currently a critical issue for medical laboratories (Butina & Schell, 2011). It focused on the level of existing professional identity rather than its development, and how working laboratory



professionals perceived their place in the healthcare team. The study concluded that lack of awareness of the profession led to muddled identity and decreased retention. This highlighted an important barrier to PIF in a MLT context – lack of general awareness of the profession.

The other study with some laboratory perspective was a Japanese study that examined the relationship between professional identity and three specific variables among allied health profession students (Kururi et al., 2016). The results of this study suggested that, unlike nursing and physiotherapy, laboratory students did not strongly associate teamwork with professional identity. This reaffirmed the perceived isolation of the laboratory profession in healthcare. These two studies underscore the need to examine how MLT students in particular, experience PIF.

The main body of work on PIF in healthcare is heterogeneous, displaying a variety of methodological approaches and theoretical frameworks. The literature also addresses disparate aspects of PIF. Some work focused on the validity and importance of the professional identity construct, some on the means of facilitating PIF and yet other work on the development of instruments for determining the degree of professional identity formed.

If professional identity is accepted as a valid construct it becomes important to understand what may contribute to or hinder PIF. Noble et al. (2014) used observation of classes and laboratory sessions in a pharmacy program to understand how the curriculum contributed to PIF. In addition, they utilized student reflective journals and interviews, which were analyzed thematically. They concluded that the curriculum did little to foster PIF and made the transition from student to professional challenging. There was little opportunity for students to explore and experiment with their impending role and educators tended to model an educator-self rather than a pharmacist-self. Students had difficulty imagining their role in patient care, also an issue for MLT students. The study returned four main themes: imagination, experimentation, observation, and evaluation. These themes echo Markus and Nurius' (1986) construct of possible selves, where identity forms as a reflection on who we are, evaluating who we are becoming, and imagining who we need to be. The study results highlighted the need for educational programs to intentionally consider PIF in curriculum development.

Imagination was also a theme in a study of medical students participating in a course titled “Becoming a Physician” (Yakov et al., 2021). Thematic analysis of student diaries identified three contributors to PIF; links to previous experience, comparison between types of working knowledge, and imagination - seeing themselves as physicians in the future. Both Noble et al. (2014) and Yakov (2021) were important in demonstrating the need to provide opportunities for students to continually reflect on the new information they are encountering, evaluate its fit with their existing concept of themselves, and look toward their future selves.

Multiple studies sought to understand how students experienced PIF in relation to a specific intervention. Wald et al. (2019) examined guided reflection in third year medical students who experienced a challenging patient encounter. The study also concluded that reflection was a valuable tool that allowed students to evaluate difficult experiences. Steinauer et al. (2019) confirmed the value of reflection, especially on challenging situations or disorienting dilemmas, as a successful intervention for PIF.

In the same vein, Wyatt et al. (2021) explored the role of a disorienting dilemma in PIF with medical students. Through a simulated scenario, the study examined the relationship of having to assume unaccustomed responsibility for patient care to PIF. Responses to the scenario were collected through focus groups and analyzed deductively for evidence of patient ownership and inductively for perceptions of PIF. The findings demonstrated that the disorientation experienced led to reconceptualization and reprioritization. Through the catalyst of disorientation and the assuming of responsibility for patient care students realized that they were not yet *thinking, acting, and feeling* like a physician and “reprioritized the components of their developmental trajectory to ensure their competence” (Wyatt et al, 2021, p. 167). This study highlighted the motivational value of autonomy, relatedness, and competence in the development of self.

As a counterpoint to that work, the results of a study by Wang et al. (2019) warned of the potential negative impact of emotional patient dilemmas on PIF. This study dealt with medical school students’ experiences in goals-of-care meetings for end of life – a stressful undertaking. The dissonance between the students’ expectations of professional physician ethics and the reality of what they observed in the workplace created distress and confusion and ultimately negatively impacted their PIF. This result

highlighted the need for a limit to the amount and kind of stress placed on students in order to not hinder their development.

Another interesting patient-centered intervention was studied by Asadian (2019), who examined PIF in an inter-professional program that utilized patients as teachers. The study involved medical, nursing, pharmacy and occupational therapy students. It found that early exposure of healthcare students to patient's perspectives increased PIF. Similar conclusions were reached in a recent UBC study based on interviews with medical residents involved in a patient mentor program (Kline, 2020). Given the limited patient exposure in laboratory medicine this was a particularly salient finding. Patient perspectives were vital in students' understanding of their agency and importance in patient wellbeing.

Social or collaborative learning has also been linked to PIF (Bridges, 2018; Vähäsantanen et al., 2017). One study addressed the value of classroom based learning among family practice residents (Chen & Hubinette, 2017). The opportunity to discuss concepts with peers in a classroom context solidified professional identity through shared understanding. Ashby et al. (2016) conducted an international cross-sectional survey of occupational therapy students and concluded that professional socialization and practice education contributed most to PIF. These findings were not surprising given the relational component of identity.

The opportunity for autonomy was examined as a factor in PIF in several studies (Brown et al., 2020; Johnson & Chauvin, 2016; Sawatsky et al., 2020). Themes emerging from these studies demonstrated the intimate connection between autonomy, patient ownership and feelings of competence. Throughout the studies that looked at the role of particular interventions in PIF, the various aspects of identity outlined by identity theory were evident. Strong motivational factors of desire for competence, relatedness to patients and peers, as well as the effects of autonomy were noted. The development of curriculum that focused on increasing those factors would benefit a MLT program as well.

Identity theory can be used to create instruments for the assessment of identity formation and stage its progress. Early in the PIF discourse, Adams et al. (2006) sought to identify factors that contributed to student baseline professional identity when they

entered a program. The study drew from a mix of healthcare educational programs - excluding MLT. The level of professional identity in applicants was measured with a group identity scale. The study established that students entering a professional healthcare program have a degree of professional identity conferred from their association with the program. It concluded that baseline PIF varied by the program applied to, by prior teamwork experience of the applicant, and knowledge of their chosen field. Mylrea et al. (2019) confirmed this finding when they evaluated PIF curriculum in a pharmacy program. Drawn on a SDT framework, students were measured with two different instruments – one focused on PIF and one on intrinsic motivation – prior to engaging with the curriculum and again after. Motivation was shown to increase significantly, but not PIF. This was attributed to high baseline professional identity in the pharmacy program. Given the general lack of awareness of the MLT profession, a focus on PIF may be even more warranted.

The problem with lack of awareness of a profession was further described by Gregory and Austin (2019). They utilized an assessment tool based on Houlden's typology (Houlden et al., 2015) - a classification system that divided existing professional identities into typologies. Gregory and Austin's Ontario based study assessed the degree and type of professional identity present in working pharmacy technicians. The results suggested that pharmacy technicians most frequently displayed a type of professional identity Houlden called identity splinting. In this form of professional identity, the individual does not feel competent to perform to the level they perceive is required, so relies heavily on previous personal identity to inform their actions. An underlying cause was determined to be lack of social validation and feelings of invisibility by pharmacy technicians in comparison to their more well-known pharmacist counterparts.

The literature suggests that baseline professional identity and the degree of relatedness within the healthcare team is an important part of PIF and from an MLT perspective an important limiting factor that should be considered and investigated. Although the experience of healthcare students in PIF has been researched, and potential interventions and instruments for evaluation explored, current knowledge is far from comprehensive or exhaustive. While much of the literature is transferrable to MLT, the profession experiences some unique challenges and room exists for studies on how MLT students experience development of professional identity within their particular social and professional context.

# **Methodology**

Identity is a highly personal thing that is influenced by social contexts. Individuals create their own reality and as a result an individual's identity is best understood through their own perceptions. This study adopted a qualitative, thematic approach to examining PIF.

## **Research Purpose and Question**

The purpose of the research was to understand, from a uniquely MLT perspective, how students experienced the transition from student to healthcare professional and the incumbent identity shifts that necessitated. This led to the formulation of the research question "How do students in a college MLT program experience the development of professional identity and their transition from student to healthcare professional?"

## **Ethical Considerations**

As a researcher fulfilling a dual role in the study, a power differential existed between myself and the participants. To mitigate this differential, students were invited to participate by a third party not connected to the program. Participation or non-participation was not known by faculty, or myself, until students had received their final professionalism grade. The hematology course that I instructed at the time of data collection was largely completed. Some participants gave consent having the majority of their hematology marks except for the final exam which was multiple choice and not subjective. Most consents and interviews occurred after the final hematology grades were posted. Confidentiality was maintained by de-identifying all student artifact submissions and in the use of pseudonyms for all journal and interview data.

## **Data Collection**

Participants were recruited from the 2021 cohort of 22 students in the MLT program at the College of New Caledonia (CNC). This cohort of students had completed the didactic portion of their training and were about to move on to clinical placement.

Students were invited to participate via email letter by a third party from the School of Health Sciences at CNC (see Appendix C – Letter of Invitation). The invitation offered participation via release of student coursework, in the form of a reflective journal, and the opportunity for an interview. Students indicated their willingness to participate by completing an online survey link embedded in the invitation letter (see Appendix D – Survey). A five-dollar gift certificate was given as a thank you for document release, and in recognition of the time commitment made, a twenty-dollar gift card for interview participation.

Eleven short reflective journals, created by students over two semesters as part of the MLT professionalism curriculum, provided written artifacts for document analysis. In addition, semi-structured interviews ranging from 25 to 40 minutes in length were conducted with seven participants. The interview guide was formulated with questions exploring student perceptions of how they felt like, thought like, and acted like laboratory technologists (see Appendix E – Interview Protocol). Participants were also asked to describe challenges they faced and how their idea of themselves had changed thus far. Interviews were audio recorded and transcribed verbatim. Participants were assigned pseudonyms which are referred to in the study.

## **Limitations/Delimitations**

COVID restrictions may have been a limiting factor in student experience of PIF in this study. The cohort's first semester was, of necessity, limited in social context and connection with instructors. Theory for the semester was delivered online and students were together in small groups for laboratory activities only. PIF may have been negatively impacted. This is an unknown variable, however, as it is also possible the opposite is true and that the shared coping experience developed stronger bonds among the cohort.

Due to the timeframe of the study, it was not possible to include students in the clinical practicum stage of the program. These students would have had clinical experience and context to add to their PIF. As such, this study is not about PIF in the entirety of the program but only in the didactic portion conducted at CNC.

Lastly, the data was coded and analyzed by a single researcher creating opportunity for bias in the results. As a MLT and instructor conducting interviews with a cohort of students that I taught, both benefits and limitations were apparent. I had an immediate rapport with interviewees and insight into comments that might not otherwise be understood. Additionally, prior knowledge of participants only went so far in that many of their responses were surprising and illuminating and not a confirmation of my personal bias. Less beneficial was the fact that they responded to me as their instructor as was noted in the many hematology (my subject) references they made. It is difficult to assess how this variable may have affected the study.

## **Data Analysis**

The interview and journal transcripts (or journal alone) for each participant were read, and reread. From the transcripts, initial descriptive comments were generated. The descriptive comments were grouped into emergent categories and the categories refined as reading progressed. Initial categories identified inductively were – perceived definition of professional identity, facilitating factors, limiting factors, values, evident tensions, need for revision, and outcomes. Emergent coding of all transcripts was completed prior to moving on to deductive analysis.

All the transcripts were reread and conceptual framework generated coding performed using the categories of: feels like, thinks like, acts like, relatedness, competence, autonomy, evaluation, and assimilation. Similarities and differences across participant responses were also considered. From the emergent and deductive coding, four main themes were developed: evidence of PIF, contributing factors, limiting factors, and experience with dissonance. These themes encompassed the various aspects of how the students described their experiences in transitioning from students, often with no knowledge of the field, to readiness for entry to clinical practicum and the professional world.

# Results

Results of this study will be presented as a narrative of students' progression in PIF using the major themes identified in data analysis. Since the literature suggests that baseline professional identity can be conferred by entry to a professional program and one's understanding of the nature of the work, it is important to consider the starting point of the study participants. In regard to their baseline knowledge of the profession, participants fell in one of two groups. Five of the eleven students had prior experience in a medical laboratory as a medical laboratory assistant. Even with a basic knowledge of the role of a MLT, these participants all felt the need to elevate their professional self in some way. For some it was the level of critical thinking required for the proper interpretation of results. For others, it was the increased weight of responsibility for patient care as Aubrey describes:

I just feel lab techs have more of a responsibility on their shoulders than a lab aide does [...] the lab tech they're the one dealing directly with the patient's doctor, recording those results. So, if something goes wrong, you're the one that's taking the hit for that.

The second group of participants had little prior knowledge of the profession and many discussed their lack of basic comprehension of the nature of the job. Alice noted, "Honestly, I had no idea lab techs existed [...] when I got into the program, I didn't know how needed they were or how important they were to the diagnosis and care of the patient". One student described their initial reaction to the lab setting vividly. "I remember going to the lab in first semester, and I was shaking I was so nervous. I had no idea. It was like going to outer-space" (Rodak).

Leia related a similar feeling:

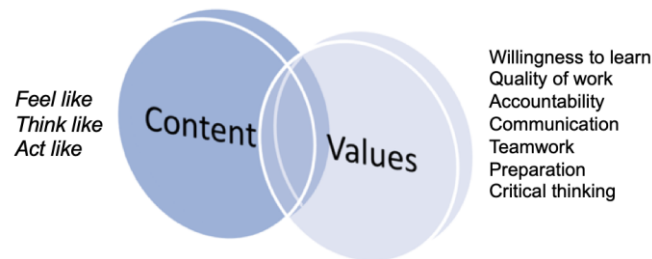
Everything was scary. I didn't even want to open drawers in our lab because I was like, I don't think I'm allowed to touch this stuff, so I didn't end up stocking my drawers in first semester at all [...] I don't feel qualified to be in here right now.

## Evidence of PIF

Regardless of starting point, at the conclusion of three semesters in the program - the time of the study - all participants were able to describe ways that they *felt like*,



*thought like*, and *acted like* a medical laboratory technologist. Without exception, they described the values that they held in relation to their work. The responses demonstrated that professional identity existed, and provided insight into the content and values that comprised it (Figure 2).



**Figure 2 Make-up of professional identity**

Participant responses indicating presence of professional identity mapped to conceptual framework. The most frequently expressed values are listed.

The most frequent report of feeling like a laboratory technologist (100%) related to increased knowledge base and lab skill development. “I feel like a lab tech with the basic knowledge that I've gained from the college” (Alice). There were also descriptions of how that knowledge was evident to them in their day to day lives. “I will be watching TV, we watch a lot of doctor shows, and I'm like, oh my god, I know what they're talking about” (Rodak). Additionally, half of respondents mentioned feeling like a lab tech in “being able to do things independently” (Aubrey).

The majority (70%) of participants perceived thinking like a lab tech as critical thinking or “problem solving, [and] just being intrigued by what I'm doing and wanting to know the ins and outs of everything” (Alice). Not being overconfident was also expressed and as was, importantly, respect for patients. “These aren't just samples, these are patients so you have to view them with that weight [...] Respect the samples, so then you know that you're respecting the patient behind them” (Ivy).

In response to the question of acting like a lab tech, various actions were described. These included being prepared, prioritizing and multitasking, working safely, working independently and producing quality results. Critical thinking is integral to producing quality results as Ivy responded:

If you are running a CBC and you have no RBCs, looking at it and figuring out what it could be. Is it cold agglutinins, does the person

actually have anemia, did you not mix the sample correctly? Those kinds of things.

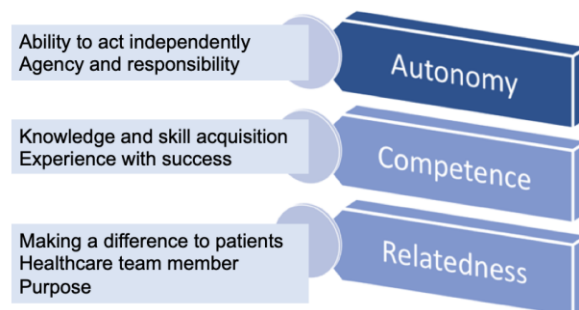
One student mentioned recognizing limitations as an important action. “I ask questions when I'm unsure of something so I don't do things that I'm not sure I could do properly” (Max).

In addition to the direct answers given to how they felt, thought, and acted like a lab tech, the students expressed many values important to being a lab professional. These values were derived from the general comments made throughout the interviews and reflective journals. “I'm always punctual, willing to learn and give my best” (Roger). “We all have the same goal which is to treat the patient and we all do this in our own unique ways and I think this is really amazing” (Jane). “We were trained on how to be responsible and accountable to details, to be focused and be goal oriented, to manage time and resources” (Alex).

The feelings, thoughts, and actions students related as well as the values they held were indicators of the content of their professional identity.

## Factors Contributing to PIF

What influenced the formulation of that content? Contributing factors in the development of professional identity were evident throughout the transcripts. They are discussed here using the motivational categories described by SDT in the conceptual framework for the study (Figure 3).



**Figure 3 Motivations**

Motivating factors expressed by participants categorized according to conceptual framework.

All participants described the gaining of competence and experience of success as influential. One described being told by someone important to them “you’re like a doctor now” (Leia) and how it felt to be recognized by others for their knowledge. It was also direct skill acquisition. “I can go into a lab and be told *you’re running a CBC and a peripheral blood film* and I know how to do that” (Ivy).

Part of competence perception was the experience had with success, as described here by Aubrey, “I would do my manual diffs and look at the answer key and they were pretty accurate [...] so, I think I know more than I give myself credit for [...] that feels pretty good to me” And again by Rodak “I do feel like I can do this and I don't think the growing and learning is going to stop past this, because I can look back and see how much I've changed.”

Autonomy was an important contributing factor in the establishment of professional identity. Once students had gained enough skills that they were able to act independently their professional identity was enhanced. Ivy expressed it very explicitly. “My confidence stems from my independence.” The role of autonomy is further implied here in Leia’s comment:

We've had a chance to use the machines on our own and figure it out a little bit. That's definitely helped with competence. [...] I figured it out and it was fine and I was like if I can figure this out by myself I'm sure I can do it again.

Others felt the agency embedded in autonomy as direct motivation. “I have a huge responsibility to really know my stuff for whichever department I am working in. Even though techs don't often see the patient, the role of the MLT in this patient's diagnosis was huge” (Anne).

The third aspect of SDT, relatedness, was also in evidence in the participant responses. This was expressed through feelings of satisfaction in being part of a helping profession and being part of the larger healthcare team and community. “Being able to provide knowledge about what's going on in a patient's body to the other integral parts of their care team is a very satisfying feeling” (Max). The influence of social representation was also evident in how the students absorbed the attitude of the instructors.

I could see that they [instructors] love this program and they love being a lab tech and understanding what they are doing. So, it made me really

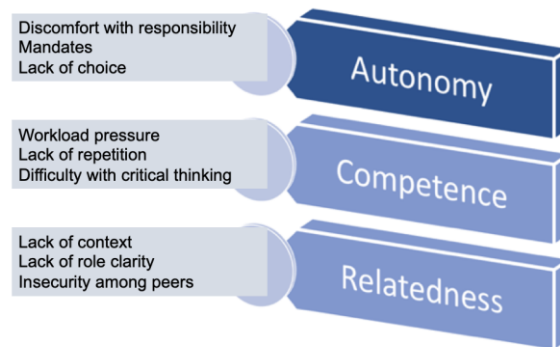
happy to go into a program where people are happy doing it and [...] where everybody has a high respect for their job. (Ivy)

Relatedness met students' innate goals as explicitly expressed by Alice, "In a way, I had been looking for something like that, something with purpose [...] I always wanted to do something that would help people".

Increased opportunity for the meeting of these essential human motivators – competence, autonomy and relatedness - in the MLT curriculum would enhance student PIF.

## Factors Limiting PIF

The motivational factors described by SDT had a limiting effect on PIF when diminished or actively subverted (Figure 4).



**Figure 4 De-motivations**

Demotivating factors expressed by participants categorized according to conceptual framework.

The main challenges to confidence in their competence arose from time pressure in labs, overall workload pressures, lack of repetition in skill development and the level of critical thinking required in complex tasks.

There were some [particular class] labs where we were really strapped for time and you want to get all your tasks done but you don't want to rush yourself so that you don't do them properly. A few labs where I had to not finish something in sacrifice for doing it properly. (Max)

Workload pressures were mentioned by 64% of participants, with not enough time to become comfortable with theoretical material or laboratory skills. "The biggest challenge to my confidence in my abilities I think is not enough repetition. I learn best

when I do something over and over again” (Jane). Critical thinking was expressed as an important part of being a lab tech by most participants and it was also an area that was described as a source of frustration and self-doubt. “It’s just a lot of moving pieces that can be gray sometimes and I like more black and white” (Alice).

Challenges to autonomy came from several sources including feelings of overwhelm in the increased agency and responsibility the transition from student to healthcare professional confers. “There is actually someone behind those samples that is probably just getting this diagnosis now and it’s just a scary thing to me” (Aubrey). In the case of one participant, their autonomy was directly subverted in the form of the COVID vaccine mandate. The student found it necessary to consider something contrary to a held principle in order to conform with the professional requirement. They expressed their feelings this way, “I didn’t feel like it was my choice [...] I was pretty angry” (Rodak).

With students who had yet to experience a clinical practicum it was not surprising that relatedness was a challenge. They struggled to imagine what their role in patient care and within the larger healthcare team would look like. “I really had no idea what the community surrounding lab professionals was like” (Leia).

Alice observed;

I’m in the mindset but I’m not physically feeling like [a lab tech] because the hospital environment is totally different [...] So it’s kind of halfway, I feel like when we get there it’ll be a lot more solidifying what we’re doing day to day.

When finding it difficult to verbalize the ways they thought like a lab tech, one participant expressed this lack of context. “I’ve never really worked with a lab tech up close to know how they think, otherwise I’ve seen the instructors but that’s not really [representative], they’re thinking like instructors too” (Anne). Issues with relatedness also appeared when unprofessional behaviour was encountered in a professional setting. “I know for a fact that they [healthcare professional] haven’t kept stuff confidential and it just made me feel discouraged” (Rodak).

Sense of belonging within the program cohort was also challenged at times. “I feel like there’s stereotypes on young women in any field. It’s a little bit of insecurity that I’m young and don’t have a bachelor’s degree” (Leia).

## Experience with Dissonance

Participant responses reflected how some professional expectations were congruent with existing identity and validated it. These expectations were easily assimilated into professional identity. For example, Alice stated “I have always been hardworking. I like to get tasks done.” In reference to thinking like a lab tech Rodak stated:

I think having order and a process. When I was a kid I was very meticulous. My mom always gave me the job of sorting the recycling because I like everything to go into the right spots. So, she always knew I like to do that job [...] I like organization.

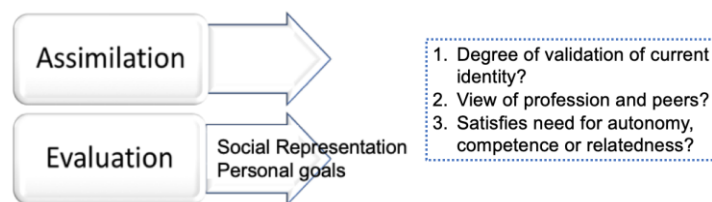
The theme of experience with dissonance tells the story of how students dealt with a professional expectation that was foreign to their existing identity. At some point in the program all participants experienced a need to revise an aspect of the content of their identity. The challenges they faced were varied. Table 1 lists each participant and a need for revision that they described either in interview or through journaling.

**Table 1** Experience with dissonance: examples by participant

Participant	Revision	Sample Quote
Leia	Confidence in critical thinking	“It’s put more why into my life, questioning things more than I had before rather than just accepting it as it is [...] my eyes have been opened to so many things that I want to question everything. [...] That’s something I’ve grown in since starting this program is my ability to look at the whole picture.”
Alice	Handling the unexpected	“My composition falls apart when things don’t go according to plan. I become anxious, lose focus and concentration.”
Rodak	Conforming with mandate	“I really struggled with getting the COVID vaccine.”
Aubrey	Asking questions	“I think it’s just getting the ego out of the way. I know I have trouble asking for help sometimes [...] I don’t want anyone to think that I don’t know anything.”
Max	Handling complications	“Timeliness I suppose. Wondering if I will be able to do the tasks in the time that will be required of me [and when] something comes up, something unexpected that demands my time [...] I’ve wavered in confidence that I would be able to successfully resolve something critical.”
Anne	Professional communication	“I am completely not meeting expectations in communication at the college.”
Ivy	Professional demeanour	“I was in the wrong a lot and making conflict and not making friends as I like to do, so I think that’s why it felt like I wasn’t being a lab tech.”

Alex	English communication skills	"I have fear of talking in a crowd and I am not confident to start a conversation."
Jane	Asking for help/self-care	"I don't want the issues I have to take over my life, and I really don't want to be unsuccessful and be seen as unreliable."
Mary	Self-confidence	"I don't want my nerves to come off as unprofessional or make me seem unprepared."
Roger	Need for preparation	"The main areas I feel I have to improve in would be my confidence when doing the labs [...] and my ability to complete things in a timely manner [...] I feel kind of unprepared for this lab, like I feel for most labs."

Each participant's experience was unique, as was their evaluation process and the degree of assimilation achieved. When confronted with a professional expectation that was either underdeveloped or incongruous with their current identity some form of evaluation occurred.



**Figure 5 Identity processes of evaluation and assimilation**

Individuals weigh the professional expectation against social representations of that quality and their personal goals – desire for a cohesive sense of self that meets their needs for autonomy, competence and relatedness.

Occurrences of evaluation were described by participants. In speaking about their experience with conflict during the program Ivy stated "I come off sometimes opinionated. And I feel like my personality sometimes gets in the way of me feeling like I'm a professional." The *relatedness* motivation for altering their professional demeanour was evident in Ivy's previous statement in (Table 1), "not making friends as I like to do". Anne thought a lot about their struggle with appropriate professional communication and follow-up. "A lot of what I had to work on was in my own personal life [...] I did a lot of seeing what will fit well with my lifestyle. I experimented a lot there." Evaluation against personal goals and fit with current identity was evident.

The most dramatic experience of dissonance and was that of Rodak, sparked by the institution of the COVID vaccine mandate for healthcare workers. As such it became

a MLT program requirement for student progression to clinical practicum. Rodak described their dilemma:

Honestly, I was at a point where I was considering dropping out. I was like, I don't know if this is for me because I had to make some life decisions to stay in the program. And I felt like the decisions weren't mine. [...] I really struggled with getting the COVID vaccine. [...] When it came down to it I had to choose to get it or I could leave something that I was really falling in love with doing. I love everything that I've done and learned, I just find it so interesting. And so, I was having this internal conflict. [...] I have strong principles and morals and beliefs and stuff and I didn't feel like it was my choice.

Feelings about complying with the mandate were intense for Rodak. The evaluation process was painful. "It was a lot of back and forth emotions and kind of angry at it." Rodak reported weighing the thoughts and wishes of their family, their own future plans, the actions of classmates in the issue and the need for patient protection in the healthcare setting. Rodak eventually decided to move forward with vaccination to stay in the program.

When I went in to get the first one, I sat there and was just ugly crying, like absolutely sobbing and the nurse was like "is everything okay?" I couldn't breathe and they were waiting to do it [...] I was like, I'm not afraid of it, I understand how it works and then they go "it's the principle of it?" I'm like, yeah, I'm not going to be able to work or continue on my career if I don't.

In response to how they currently felt about the decision Rodak said "I kind of just had to decide internally to just let it be okay. Otherwise it would just eat me up. [...] I'm excited to move forward. It still feels pretty raw." This experience was a complex one for the student, apparently only partially resolved. It was a vivid example of evaluating and assimilating a dissonant concept. It is uncertain what the final resolution, and effect on the participant's professional identity, will be.



## Discussion

The purpose of this study was to shed light on the experiences of MLT students - an under-researched group - in forming professional identity. All students successfully formulated a degree of professional identity over the course of three didactic semesters at the college as demonstrated in their descriptions of *feeling like, thinking like, and acting like* medical laboratory technologists as well the values they held. Employing the lens of SDT, the contributing and limiting factors that participants described can be linked to motivation or de-motivation based on the satisfaction of autonomy, competence, or relatedness. Echoing previous findings (Mylrea et al., 2017; Steinauer et al., 2019; ten Cate et al., 2011), SDT is a useful theoretical framework for categorizing student experience and for assessing program curriculum. It serves as a tool for developing interventions that would enhance PIF and provide maximum support for students negotiating identity dissonance.

Prior research that had an MLT component showed that MLT faces some unique challenges due to basic lack of awareness of the profession (Butina & Schell, 2011; Kururi et al., 2016). This finding was confirmed by my results in the lack of awareness that students reported. Often, they came into the program with little concept of what their future job entailed. Even at the conclusion of didactic training many expressed nervousness over still not really comprehending how work would flow or what would be expected of them. Interventions should be considered to maximize understanding of their role as much as practical while at the college.

One such intervention is the inclusion of simulated “real-life” experiences. Students described the understanding of the big picture and simulated “work” experience as being influential in PIF. For this cohort, the amount of simulated “working” experience was not enough for the majority of students to get a firm grasp on workflow and their role in patient care and many expressed a fear of the unknown going into the clinical setting. The additional benefit of simulation is the creation of a safe space to make mistakes as was as described and valued by 36% of participants. Extra time devoted to these activities would increase perception of competence and autonomy and would allow students time to imagine their future professional selves (Noble et al., 2014; Yakov et al., 2021).

The other important aspect of context is the relational one. The structure of the program - no clinical rotations until all three semesters of didactic study are completed - afforded students no opportunity for early exposure to clinical role models. Results of this study showed that instructors alone are not always perceived as “working technologists”. In fact, when participants were asked during interview where their concept of being a lab tech came from, most identified someone other than the instructors – either the CNC lab prep staff, the outside clinical staff that came to the college to assist in lab sessions, or their peers who were lab assistants. This parallels Noble et al.’s findings (2014) of lack of role models during didactic training. To encourage relatedness, programs should provide as much exposure to working lab staff as possible, provided they are carefully chosen for their excellence in professional standards. The use of patients in healthcare education, as suggested by literature (Asadian, 2019; Kline et al., 2020), would reinforce students’ sense of purpose and belonging. Hearing first hand from patients could increase relatedness significantly.

One of the significant themes of student experience in PIF was the reconciling of professional values that were somewhat foreign or incongruous with their existing identity. Experiences ranged from mild adjustments to truly emotional decisions. Any activity that increases intrinsic motivation would be helpful for students negotiating dissonance. Reflection was a helpful tool mentioned by several participants, confirming previous findings (Steinauer et al., 2019; Wald et al., 2019). Thought should also be given to increasing baseline PIF through program candidate selection processes in order to limit potential dissonance (Creuss et al., 2014).

A measure that would facilitate many of the aforementioned practices is sufficient program length. The majority of participants felt the burden of workload pressures (64%). Students described stress and difficulty in balancing workload and sufficient self-care. There should be time afforded for thorough reflection. If PIF is a goal, healthcare education programs need to give students time to figure out *who they are, who they are becoming, and who they want to be* (Markus and Nurius, 1986) in relation to their chosen profession. Given the stress that the healthcare system is under, greater PIF achieved at the college could serve as an insulator against challenges in practicum. It will prepare students for the rigors of the current undermanned and overworked clinical setting and potentially lead to greater retention (Butina & Schell, 2011). A more workable

pace will also provide time for self-care, for theory absorption, and allow repetition for skill development.

Clearly there is a great need for more work on PIF in MLT education. From the small sample this study provided no firm conclusions can be reached. It would be important to conduct a wider study over multiple programs and cohorts. Avenues for further study include the utility of particular interventions for MLT PIF. What is the effect of a short clinical experience earlier in the training? If simulation is done, how much simulation is ideal? What is the effect of inter-discipline experience on PIF? Also of interest is how students experience PIF during the practicum phase of their training. Is PIF formation negatively impacted when students encounter practices contrary to their ideals in a critically short-staffed practicum placement? Should PIF be evaluated and if so, what role should it play in student progression? There are many more avenues that could be pursued. Understanding PIF in MLT students has only begun.

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## Appendix A.

**Table A.1 Final Themes with quotes**

Theme	Subthemes	Quotes
Evidence of PIF	Feel like	I will be watching TV, we watch a lot of doctor shows, and I'm like oh my god I know what they're talking about - Rodak
		I feel like a lab tech in that I feel responsible for the well-being of the patients - Max
		I feel like a lab tech with the basic knowledge that I've gained from the college - Alice
	Think like	problem solving, just being intrigued by what I'm doing and wanting to know the ins and outs of everything - Alice
		these aren't just sample, these are patients so you have to view them with that weight...respect the samples, so then you know that you're respecting the patient behind them - Ivy
		I think not being overconfident too. Some people think "I know how to do this". I think for me it's like "I know you know this but still expect the unexpected" - Aubrey
	Act like	If you are running a CBC and you have no RBCs, looking at it and figuring out what it could be. Is it cold agglutinins, does the person actually have anemia, did you not mix the sample correctly. Those kinds of things. - Ivy
		I ask questions when I'm unsure of something so I don't do things that I'm not sure I could do properly" - Max
		I think being prepared was something I tried to do - Rodak
	Values held	I'm always punctual, willing to learn and give my best - Roger
		We all have the same goal which is to treat the patient and we all do this in our own unique ways and I think this is really amazing. - Jane
		We were trained on how to be responsible and accountable to details, to be focused and be goal oriented, to manage time and resources. - Alex
Contributing Factors to PIF	Competence	I can go into a lab and be told "you're running a CBC and a peripheral blood film" and I know how to do that. - Ivy
		You're like a doctor now - Leia
		I do feel like I can do this and I don't think the growing and learning is going to stop past this, because I can look back and see how much I've changed. - Rodak
	Autonomy	I have a huge responsibility to really know my stuff for whichever department I am working in. Even though techs don't often see the patient the role of the MLT in this patient's diagnosis was huge. - Anne

		We've had a chance to use the machines on our own and figure it out a little bit. That's definitely helped with competence. [...] I figured it out and it was fine and I was like if I can figure this out by myself I'm sure I can do it again." - Leia
		My confidence stems from my independence. - Ivy
	Relatedness	Being able to provide knowledge about what's going on in a patient's body to the other integral parts of their care team is a very satisfying feeling. - Max
		In a way, I had been looking for something like that, something with purpose [...] I always wanted to do something that would help people. - Alice
		It makes me feel excited about collaborating with other healthcare professionals and learn what it's like on their side of patient care. - Aubrey
		I could see that they [instructors] love this program and they love being a lab tech and understanding what they are doing. So, it made me really happy to go into a program where people are happy doing it and... where everybody has a high respect for their job" - Ivy
Limitations to PIF	Competence	It's just a lot of moving pieces that can be gray sometimes and I like more black and white. - Alice
		The biggest challenge to my confidence in my abilities I think is not enough repetition. I learn best when I do something over and over again. - Jane
		There were some [particular class] labs where we were really strapped for time and you want to get all your tasks done but you don't want to rush yourself so that you don't do them properly. A few labs where I had to not finish something in sacrifice for doing it properly. - Megan
	Autonomy	I remember going to the lab in first semester, and I was shaking I was so nervous. I had no idea. It was like going to outerspace. - Rodak
		I didn't feel like it was my choice [...] I was pretty angry - Rodak
		There is actually someone behind those samples that is probably just getting this diagnosis now and it's just a scary thing to me. - Aubrey
	Relatedness	I really had no idea what the community surrounding lab professionals was like. - Leia
		I've never really worked with a lab tech up close to know how they think, otherwise I've seen the instructors but that's not really [representative], they're thinking like instructors too. - Anne
		I feel like there's stereotypes on young women in any field. It's a little bit of insecurity that I'm young and don't have a bachelor's degree. - Leia

Experience of Dissonance	Challenges	My composition falls apart when things don't go according to plan. I become anxious lose focus and concentration - Alice
		I was in the wrong a lot and making conflict and not making friends as I like to do, so I think that's why it felt like I wasn't being a lab tech. - Ivy
		I think it's just getting the ego out of the way. I know I have trouble asking for help sometimes [...] I don't want anyone to think that I don't know anything - Aubrey
	Evidence of Evaluation	I had to choose to get it [vaccine] or leave something that I was really falling in love with doing [...] so I was having this internal conflict - Rodak
		I come off sometimes opinionated. And I feel like my personality sometimes gets in the way of me feeling like I'm a professional. - Ivy
		A lot of what I had to work on was in my own personal life [...] I did a lot of seeing what will fit well with my lifestyle. I experimented a lot there. - Anne
	Evidence of Assimilation	That lab is like your little home and you take care of it - Leia
		I think that's my process mixing in with the process of being a lab tech - Rodak
		I have always been hardworking, I like to get tasks done" Alice

**Table A.2 Complete coding tree**

<b>Final Themes</b>	<b>Deductive Categories</b>	<b>Inductive Categories</b>
Evidence of PIF	Feels like Thinks like Acts like	Definition of professional identity Values
Contributing Factors	Relatedness Competence Autonomy	Facilitators
Limiting Factors	Relatedness Competence Autonomy	Limitations
Experience with Dissonance	Evaluation Assimilation	Tensions Outcomes Revision need/no need

## Appendix B

**Table B.1 Values described by participants**

<b>Value</b>	<b>Prevalence (% of participants)</b>
Willingness to learn and reflective practice	64
Quality of work and thoroughness	64
Accountability	54
Communication	45
Teamwork	45
Preparation	45
Critical thinking/problem solving	45
Time Management	36
Punctuality	27
Independence	27
Professional Demeanour	27
Caring and helping	27
Focus	27
Commitment	27
Safety	18
Self-confidence	18
Confidentiality	18
Flexibility	9
Organization	9
Life balance	9

**Table B.2 Described factors in PIF**

ITEM	Prevalence (%)
<b><i>Facilitating Factors in PIF</i></b>	
Competence and experiences with success	100
Increase in knowledge base	73
Value of work/professional role	73
Gaining of context and big picture	45
Simulated work-like experiences	45
Role models (total)	45
Instructors	(2 participants)
Peer MLAs	(1 participant)
Prep staff	(1 participant)
Clinical lab helpers	(1 participant)
Independence	36
Instructor feedback	36
Safe space/making mistakes	36
Reflection	18
<b><i>Limiting Factors in PIF</i></b>	
Lack of context	64
Workload pressures	64
Self-doubt	64
Lack of practice	45
Online theory component	18
General lecture format	9

# Appendix C Letter of Invitation

## Research Study Participation

### Professional Identity Formation (PIF) in Medical Laboratory Technology Students

Student Lead Researcher

Kim Larson, MEd Candidate, Faculty of Education, SFU

#### Purpose

The purpose of this study is to explore how students in a college Medical Laboratory Technology (MLT) program experience the development of professional identity.

You have been invited to participate in this study through your role as a student in the MLT program at the College of New Caledonia. As an MEd candidate and educator in the program, I am interested in understanding how professional identity formation (PIF) occurs in MLT students and how they experience the transition from student to healthcare professional. This means exploring how students as individuals integrate the social, ethical and technical norms of the MLT profession with their existing sense of self. Some goals of this research are to identify potential barriers to PIF as well as assist in the development of curriculum to better facilitate it. The information gleaned from this study can also inform avenues of pursuit for further MLT-specific research and form the basis for developing a framework for meaningful professionalism assessment.

The findings of this project will be used as partial requirement for the completion of my Masters of Educational Leadership. The final report and results will be presented during the SFU 2022 Summer Institute, and potentially other conferences, and publication opportunities.

#### Study Procedures

You are being invited to participate in this study in two ways:

Consent to the use of your student work from the professionalism portion of semester two and three for **document analysis**. This will consist of the professionalism journal you maintain over that timeframe. **Your decision on whether or not to participate will be collected through the online survey link at the end of this invitation.** If you consent to the release of your documents, your work will be reviewed for commonalities and the emergence of consistent themes that inform the topic of professional identity. The document analysis is not an evaluation, rather it is a consultation to hear your voice. All identifiers will be removed and the data anonymized.

A **one-on-one interview** with myself. This interview would take approximately 30 - 60 minutes of your time and be audio recorded. Interviews will be conducted via Zoom and scheduled at a time that is convenient for you. Interview questions and a consent form will be provided in advance. You have the right to not answer any question and to withdraw from the project at any time.

As participation in this project is entirely voluntary, you may choose to participate in both ways, only one way, or neither.

Please note that your decision to participate or not will not be known by faculty until professionalism grades are determined and reported. The hematology course that the student lead researcher will be instructing the cohort at the time of the consent process will be largely completed and students will have the majority of their marks for the course. The final exam in the hematology course is multiple choice and not subjective.

This is a **minimal risk study**. The stress involved in participating will be no more than the stress that you encounter in your daily student life.

### **Confidentiality**

**Data Storage.** Audio-recordings, transcripts, and other information related to this research study will be kept on a **password protected** personal computer or other device (digital recorder, smart phone, etc.) in a locked location. Only I, Kim Larson, as researcher along with my senior supervisor, Dr. Michelle Pidgeon, will have access to the data. The data will be retained for approximately three months and destroyed at the completion of the research project. Should the findings be published in a journal, the data will be held for a period of 5 years and then destroyed. To assure your confidentiality, all information gathered from the interview and from student documents will be coded and all personal identifiers will be removed.

**Interview data.** Transcription of the interview data will be done using an online application, Otter.ai. Any data you provide may be transmitted and stored in countries outside of Canada, as well as in Canada. It is important to remember that privacy laws vary in different countries and may not be the same as in Canada. Your interview data will be de-identified prior to uploading. Once the data has been uploaded it will be transcribed and erased from the platform within 24 hours. Original audio recordings will be destroyed as soon as transcription is complete.

**Data usage.** The data will be used in a research report for my MEd requirements. It will also be summarized in a poster that will be shared at a culminating event with my MEd cohort and faculty. After I complete all of my MEd degree requirements, I will share the findings with the other health science faculties at the college and potentially with the CSMLS. I will also share the findings with MLT students who are interested.

Your confidentiality will be respected during this research project and in the dissemination of its results. At no time will your name and/or affiliation be disclosed.

### **Voluntary Participation**

You can decide to stop participating at any point in the process, for any reason. Your decision to participate (or not) will not be shared with anyone. There are no negative consequences for not participating or withdrawing your participation.



**Remuneration/Compensation.** As a small thank you for consenting to the use of your documents, you will receive a \$5 gift card. For participating in an interview, you will receive a \$20 gift card.

**Contact for information about the study.** If you have any questions about this project, please contact Kim Larson, 250.562.2131 ext 5519, or [kim\\_larson\\_2@sfu.ca](mailto:kim_larson_2@sfu.ca). You may also contact the senior supervisor/principal investigator, Dr. Michelle Pidgeon, Faculty of Education, 778.782.8609 or [michelle\\_pidgeon@sfu.ca](mailto:michelle_pidgeon@sfu.ca).

**Contact for concerns about the study.** If you have any concerns about your rights as a research participant and/or your experiences while participating in this study, you may contact the SFU Office of Research Ethics at [dore@sfu.ca](mailto:dore@sfu.ca) or 778-782-6618. You may reach the CNC research ethics board coordinator at [reb@cnc.bc.ca](mailto:reb@cnc.bc.ca).

**Please follow the survey link below to indicate your participation preferences.**

<https://www.surveymonkey.ca/r/F6K8V2B>

or scan the QR code



After the completion of professionalism assessments at the end of April 2022, I will collect the list of participants. If you choose to participate in an interview I will follow up with you directly by e-mail. If you have any questions about this project, please contact me.

Many thanks for your assistance,

Kim Larson

MEd candidate

Faculty of Education

Simon Fraser University

# Appendix D Survey

**Research Project: Professional Identity in MLT students**

**Student Participation Consent Form**

\* 1. Please enter your first and last name and provide your contact email.

**Name**

**Email Address**

\* 2. By checking the box below, indicate whether or not you consent to the use of your professionalism portfolio document. Remember that all identification will be removed, and the portfolio will only be consulted for any information that is relevant to the topic of professional identity.

I **do not** consent to the use of my documents for this study.

I consent to the use of my professionalism portfolio for this study.

\* 3. By checking the appropriate box, indicate whether or not you would like to participate in a one-on-one interview. If yes, you will be contacted and a consent form and list of questions will be sent to you.

I **am interested** in participating in an interview

I **am not interested** in participating in an interview at this time.

4. If you are participating in this study, please indicate your preference in gift card.

Starbucks

Tim Horton's

Amazon

# Appendix E Interview Protocol

## Preamble

Thank you for your interest in this project and your time in meeting with me today. The purpose of this research is to provide some lab specific information to the discussion of professional identity formation. Before we begin I would like to review the terms of consent for your participation. I would like to remind you that all information will be de-identified, so that no one, other than myself, will know of your participation or the input you give. Nothing you say will be attributable to you. You can choose not to answer a question or end your participation at any time. Do you have any questions so far? I will be making an audio recording of our conversation if that is alright with you. Do I have your permission to record? What pseudonym would like to be known by? Thank you, let's get started.

1. What does "professional identity" mean to you?

2. In what ways do you feel like a lab tech?

*Prompt:* When did you first notice these feelings?

*Prompt:* Can you describe what contributed to or hindered this feeling?

3. In what ways do you think like a lab tech?

*Prompt:* How did you determine what constitutes thinking like a lab tech?

4. What actions do you take that are consistent with your view of a lab tech?

*Prompt:* Can you describe an example from the program either in class or lab?

5. Can you describe any times that you felt you were a long way from meeting professional expectations?

*Prompt:* How did you address it?

6. How has your idea of yourself changed over the course of this program?

I appreciate the time you have taken to be here today and for your willingness to discuss your thoughts around professional identity. Remember the resources that are available at CNC Health and Wellness if anything has come up that you might want to talk further about. You already received contact information by email but I will provide it again at the conclusion of this interview. Do you have any questions for me?

It is my hope that the information gathered from this study will help make the program and the profession stronger. Thank you so much.