

Learners in a Canadian Diagnostic-Focused Competency-Based Medical Education Program:
A Qualitative Case Study

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by

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Abstract

This dissertation explores the experiences of medical residents within a diagnostic-focused specialty, Pathology, who are undergoing training in a competency-based medical education (CBME) curriculum in Canada. Through an instrumental case study design, the research aims to provide a nuanced understanding of the learner experience in a mandated outcomes-based education (OBE) curriculum, with a particular focus on the implications for learner-centered education from an adult learning perspective.

The study involved six participants across various stages of their residency - three in their first year, two in their third year, and one in their fourth year. Data collection methods included document analysis of relevant program and Royal College materials related to competence by design, a focus group, individual semi-structured interviews, and researcher journaling. The analysis revealed several key themes: the benefits of an outcomes-based approach, the identification of gaps between prior skills and mandated objectives, the balance between learner autonomy and the need for structured support, the critical role of community practice, and the importance of shared understanding between faculty and learners.

The findings suggest that while CBME and OBE programs offer significant advantages in aligning educational outcomes with professional competencies, challenges remain in its implementation, particularly in ensuring that all stakeholders - learners and educators alike - share a common understanding of the curriculum's goals and expectations. The study contributes to educational theory by reinforcing the importance of learner-centered approaches and the role of communities of practice in professional education. It also offers practical implications for enhancing the design and delivery of CBME programs, highlighting the need for tailored learning approaches, structured support mechanisms, and robust faculty development initiatives.

This research adds to the existing literature, underscoring the complexity of transitioning to a CBME framework in medical education and calls for further exploration into the long-term impacts of this approach on both learners and educators. It affirms that OBE often presents as a reductionist approach to education, with mandated outcomes becoming a checklist for learners to complete. It does, however, also affirm that there is merit in learners having a roadmap to their educational program in the form of outcomes lists. The study challenges the concept of OBE in the form of CBME being a learner-centred approach to education and illuminates how the construct of a diagnostic-focused residency training program falls short in providing a holistic competency-focused curricula. The findings have broad relevance for the ongoing evolution of medical and professional education programs.

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Chapter 1: Introduction

Adult education is concerned with learners in formal, non-formal and informal settings (Rose, 2021). Learners such as medical residents, who are engaged in formal and professional education, are of particular concern to adult educators, as they are preparing for future educational roles in the community with clients and in clinical settings with other professionals in training. How medical residents are educated matters, as they will have a large impact on the health of the population and will influence how citizens learn about health (Coady, 2021; Hearn et al., 2019). In Canada, the professional education programs within which medical residents learn to be practicing physicians have begun a mandated shift to an outcomes-based curriculum, and there is much to discover about how this shift is viewed by the learners involved.

As today's learners in postgraduate professional health education programs navigate the shift from trainee to practitioner, they are not only responsible for obtaining clinical skill outcomes but also for becoming well-rounded members of complex healthcare teams to enhance patient care (Noble et al., 2019). Although previously focused on functionalism with an individual obtaining the skills to complete the tasks of a role, professional education has moved to a more pluralist focus with a practitioner's responsible practice at the forefront (Bierema, 2018). A need for responsible practice is especially important when the practice affects the care and well-being of others, as seen in health education programs (Coady, 2021). According to the Royal College of Physicians and Surgeons of Canada (RCPSC or Royal College) (2017), enhancing patient care and demonstrating "the skills and behaviours required to meet evolving patient needs" (p. 1) is a central goal of competency-based medical education (CBME) in Canada. However, whether or not this goal is met and how this goal is translated into educational practice is unclear (Sherbino et al., 2020). Also lacking in the conversation is how the new

framework for educating residents considers adult education theory and the learner experience amid the shift to competency-based medical education.

Research Context

To become a practicing physician in Canada is to engage in the practice of lifelong learning. Adult learners who find themselves in a postgraduate medical education program would have completed an undergraduate degree and competed in a rigorous selection process to be accepted to medical school. In medical school, learners are part of a 4-year undergraduate medical education (UGME) program. They complete 2 years of formal learning covering the foundations of medicine through lectures, small group learning sessions, simulated patient sessions, and a small number of on-the-job elective experiences in a hospital setting. In their third and fourth years, they undertake apprenticeship or “clerkship” training which sees them rotate through various clinical specialties in a hospital. Their experiences are scheduled for them in their third year, but they have the autonomy to schedule a number of electives for themselves in their fourth year. From these on-the-job experiences, learners are encouraged to cultivate their interest and focus in on one or two specialty areas that they may like to seek further apprenticeship training in.

What is the learner’s experience in Canadian medical training programs which operate in a competency-based medical education environment? Currently, medical school graduates in Canada who have completed their 4-year Doctor of Medicine degree undertake a 2 to 6-year residency training program in their chosen specialty (e.g., 2 years for Family Medicine, 5 years for most specialties like Anatomical Pathology, and 6 years for surgical specialties like Cardiac Surgery). Training programs have historically been organized in a time-based model, consisting of clinical rotations, scheduled in four-week blocks. The Royal College is the accrediting body

for residency training programs in Canada and the licensing body for practicing specialist physicians. Beginning in July 2017, Canadian residency training programs began the mandated transition from the long-used time-based model of curriculum to an outcomes-based model called Competence by Design (CBD). Through this research, I aimed to give voice to the learner experience in a Canadian residency training program that has made the transition to the CBD approach.

Definitions and Acronyms

Though many of the terms and acronyms used in this dissertation will be familiar, some have a specific meaning in the context of my research. To provide clarity, I state my specific understanding and use of select terms here.

CBME – Competency-based medical education refers to an “an outcomes based approach to the design, implementation, assessment, and evaluation of a medical education program using an organizing framework of competencies. In a CBME system, a curriculum is organized around the outcomes expected of a resident and that resident’s advancement is dependent on having achieved those expected outcomes.” (Royal College of Physicians and Surgeons, 2016, para. 1)

CBD – Competence by design. This term refers to “The Royal College of Physicians and Surgeons of Canada’s major change initiative to reform the training of medical specialists in Canada. It is based on a global movement known as Competency-based medical education (CBME) and is led by the medical education community. The objective of CBD is to ensure physicians graduate with the competencies required to meet local health needs. It aims to enhance patient care by improving learning and assessment in residency.” (Royal College of Physicians and Surgeons of Canada, n.d., para. 1)

OBE - Outcomes-based education. This is an educational model with roots in behavioural conditioning, focusing on cultivating observable behaviours in learners in training programs. Pre-determined learner outcomes guide curriculum development. (Adapted from A. Morcke, T. Dornan, & B. Eika, 2013).

The Shift to Competency-Based Medical Education

Residency training programs in Canada began a mandated, phased transition to a competency-based medical education framework, starting in July 2017, with Anesthesia and Otolaryngology (ENT) being the first specialties to incorporate the new system. This move was

directed by the Royal College, the accrediting body for residency training programs and the credentialing body for practicing physicians in Canada. Interest in competency-based medical education initially grew following the Flexner Report of 1910. The report's availability to the general public sparked a need for public accountability in medical education and thus garnered an interest in regulating bodies to move towards an outcomes-based framework (Ludmerer, 2010). The Royal College (2022) introduced an overarching framework of CanMEDS medical education competencies in 1996, with a desire to eventually have each specialty program develop their own specific set of practice-based competencies to use in conjunction with CanMEDS. This vision has come to fruition and now universities and specialty training programs must adapt their current time-based curriculum and evaluation structures to the new competency-based format, in order to maintain their accreditation status. The Royal College has named the Canadian version of the competency-based medical education framework "Competence by Design" (Royal College of Physicians and Surgeons of Canada, n.d.).

Although a de-emphasis of time-based learning is one of the defining features of a competency-based program (Frank et al., 2010), the CBD framework is a hybrid time- and competency-based model. The CBD model marries the traditional time-based model of residency education comprised of 4-week clinical rotation blocks to an outcomes-based framework. However, there is an understanding that each learner may require different 4-week experiences to meet individual learning needs. A defining feature of CBD is that it uses a learner-driven programmatic assessment approach. As Sherbino et al. (2020) explain, programmatic assessment is the "systematic, longitudinal acquisition of multiple assessments from multiple assessors addressing multiple competencies to inform a group-based global judgement of a trainee's progression towards a competent practice" (p. 99). As such, the final, summative evaluations

based on CanMEDS competencies that were commonplace after each 4-week rotation in the traditional model of medical education are to be supplemented or replaced with frequent formative evaluations based on specialty-specific competencies (dubbed “Entrustable Professional Activities” or EPAs) in the CBD model. The timing of these formative evaluations of competence is largely to be left up to the learners. They can choose when and which faculty member completes an evaluation form based on which competencies they need to fulfill at various points in time (Royal College, 2017).

As programs continue to transition to CBD, much is being said about the implementation process and need for faculty development, but less attention is given to the educational theory informing the shift and promised learner-centric experiences of the learners in the programs. This is especially true for diagnostic-focused specialties like Pathology and Diagnostic Radiology. With an early emphasis on streamlining healthcare systems and improving patient care, the move to a CBME approach was heavily planned with surgical specialties such as General Surgery, Emergency Medicine, and Anesthesiology at the forefront (Harris et al., 2019; Sherbino et al., 2020). Curriculum artifacts such as evaluation forms and faculty guides were designed with a focus on observation of the learner to evaluate competence. Diagnostic specialties had to reimagine how CBME would work within their environments which see less direct patient interaction (Clarke et al., 2019; Koch et al., 2021). My dissertation research uses adult education theory to illuminate the learner experience in a diagnostic-focused residency training program that has transitioned to CBME. In this chapter, I will provide an overview of my doctoral research project.

Procedural-focused Versus Diagnostic-focused Residency Training Programs

Throughout this dissertation, the nuances of a procedural-focused versus a diagnostic-focused residency training program are alluded to. As such, it is important for the reader to be aware of the distinctions between these types of programs in a Canadian context. In Canada, there are 41 specialty residency-training programs governed by the Royal College of Physicians and Surgeons of Canada (RCPSC). The majority of these programs such as General Surgery, Emergency Medicine, Anesthesiology, and Obstetrics/Gynecology are considered to be procedural-focused specialties at the forefront of healthcare with a high volume of patient interaction. A fewer number of specialties such as Pathology, Diagnostic Radiology, and Neurology are diagnostic-focused and tend to work behind the scenes with little to no direct patient interaction. The differentiating features of these two classifications of programs are discussed below.

In a procedural-focused residency training program, the educational curriculum places an emphasis on hands-on skill development that can be easily observed by a faculty member or other member of the healthcare team. In these types of programs, residents spend significant time in operating rooms, procedural suites, or in other settings where they learn and perform various procedures and patient interventions under supervision. These on-the-job learning experiences are supplemented with regular didactic teaching sessions, but the focus of learning outcomes is on mastering techniques such as suturing, endoscopy, catheterization, and other procedures.

In a diagnostic-focused residency training program, however, educational training prioritizes the interpretation of diagnostic tests, patient history, and laboratory findings. Residents spend more time in clinical settings such as outpatient clinics, wards, and diagnostic laboratories, working alongside faculty members to review patient cases and provide diagnostic

reports for other health professionals. Learning is also supplemented with didactic teaching sessions, with an emphasis on repeated exposure to patient cases to fulfil the outcomes of being able to delineate a broad spectrum of clinical presentations.

In both streams of programs, there is some overlap of types of learning. For example, in a procedural-focused specialty like Emergency Medicine, learners are expected to develop skills in reading basic point-of-care Ultrasound images. And, in a diagnostic-focused specialty like Diagnostic Radiology, learners must spend time on interventional Radiology rotations where they eventually need to show competence in skills like performing biopsies and catheterizations. Both types of programs include procedural-based and diagnostic-based outcomes in their lists of Entrustable Professional Activities (EPAs), but the mix heavily corresponds to which type of specialty it is.

In the Canadian competency-based medical education (CBME) context, the competence by design (CBD) framework was initially designed with representatives from procedural-focused specialties at the forefront of the development. This agency, coupled with the overall suitability of CBME to procedural-focused specialties, meant that learner evaluation forms and faculty development materials were attentive to the needs of specialties with observable teaching moments. As such, the CBD framework was made to fit well in procedural-focused specialties but did not apply as well to their diagnostic-focused counterparts. This divide is why I chose to examine the experiences of learners in a lesser-considered diagnostic-focused specialty - To allow for nuanced insight into those programs that were not at the forefront of development and to discover more about the learners in them. In this study, the medical specialty of Pathology and the experiences of the learners who are studying to become practicing Pathologists were explored.

Pathology Residency Training in Canada

The medical specialty of Pathology is one that plays a critical role in diagnosing diseases and understanding the underlying causes of various health conditions. In Canada, Pathology residency training is a specialized program that equips future pathologists with the knowledge and skills necessary to work in this field. This overview delves into the essential aspects of Pathology residency education in Canada, including the curriculum, requirements, duration, and the role of pathology in the Canadian healthcare system.

Overview of Pathology Residency Training

Pathology residency education programs in Canada are designed to prepare medical doctors to become competent and skilled Pathologists. Pathologists are responsible for diagnosing diseases, examining tissues and cells, and contributing to patient care by providing essential information to guide treatment decisions. They play an important role in both clinical and research-related aspects of healthcare. During the five-year residency program, learners acquire a comprehensive understanding of various subspecialties within Pathology, such as Anatomical Pathology, Clinical Pathology, and Forensic Pathology. Training programs are demanding and require learners' engagement in the education curriculum and patient care.

To be eligible for Pathology residency training in Canada, candidates must have completed their medical degree (MD) and hold a valid license to practice medicine in the province in which they are training. The application process involves applying through the Canadian Resident Matching Service (CaRMS), which is responsible for the allocation of residency positions at Canadian medical schools. The matching process for residency positions in Canada is competitive, with applicants being evaluated on their academic performance, letters of recommendation, personal statements, and having to interview with each program they apply

to that selects them for their short-list. Additionally, some programs may require specific prerequisite courses or experience in a related field. Once interviews conclude, candidates rank the programs at various universities that they would like to be matched to and programs rank the candidates that they would like to see matched to them. On a national Match Day held annually in March, the CaRMS website runs an algorithm that matches candidates to residency program seats. The results are final, with the candidates then completing residency education in the program at the university they matched to. If a student is unsuccessful in the CaRMS match they may return to school for an additional year to strengthen their application via clinical and/or research electives and reapply to CaRMS the following year. Or some may explore alternative career paths such as public health or research. Pathology is a sought-after residency program in Canada for students who are passionate about diagnostics and lab-based medicine. Although it is not as competitive as some other specialties, like surgery, it still offers excellent career prospects, particularly in areas like hematopathology and molecular pathology.

Curriculum and Training Structure

The Pathology residency program in Canada is divided into various components, each focusing on different aspects of the discipline. These components include Anatomical Pathology, Clinical Pathology, Forensic Pathology, and research. These distinct content areas are explored through learning on clinical rotations and learner competence is assessed via assessments and evaluations. These various curriculum components are explored below.

Anatomical Pathology. Anatomical Pathology emphasizes the study of tissues, organs, and cells to diagnose diseases. In this part of their curriculum, residents learn how to analyze biopsies, surgical specimens, and perform autopsies. They also gain expertise in cytology, neuropathology, and Pediatric Pathology.

Clinical Pathology. In Clinical Pathology, there is a focus on laboratory medicine and diagnostic testing. Residents learn to interpret laboratory results, manage clinical laboratories, and provide guidance on diagnostic testing and treatment options. Hematopathology, microbiology, and transfusion medicine are key areas of study.

Forensic Pathology. Forensic Pathology deals with investigating the cause of death in cases of sudden, unexpected, or suspicious deaths. This area covers post-mortem examinations, toxicology, and interacting with law enforcement agencies.

Research. Research is a fundamental aspect of residency training programs in Canada and residents are required to engage in research projects as part of their learning outcomes. These projects can contribute to the advancement of medical knowledge and can sometimes aim to improve patient care.

Clinical Rotations. Pathology residents undertake a number of clinical rotations during their training. Each academic year is divided into 12 four-week rotation blocks which comprise a resident's learning schedule. These rotations provide hands-on experience in order to foster diagnostic skills and exposure to various subspecialties within Pathology. Residents work closely with experienced Pathologists and laboratory staff, gaining practical knowledge and expertise in their chosen field.

Assessments and Examinations. Residents are continuously evaluated throughout their training via their mandated outcomes or Entrustable Professional Activities (EPA) evaluation forms. In addition to these ongoing formative assessments, other evaluations, including written and oral exams, are conducted to ensure that residents meet necessary competency standards. Along with formal assessments, residents are expected to maintain a portfolio of their work, including reports, presentations, and contributions to research. This portfolio is used to assess

their progress and readiness for independent practice. Beyond program-level assessment and exams, Pathology residents aim to obtain certification from the Royal College of Physicians and Surgeons of Canada (RCPSC), which is a mandatory step in becoming a licensed Pathologist in Canada. This certification requirement helps to shape residents' career paths and learning experiences, as learner focus progressively shifts to the successful completion of the RCPSC exam as they progress through the program. The first part of the certification exam takes place late in a learner's fourth year of their program, with the second part taking place in early in their fifth year. Once a learner passes both parts of their certification exam, meets all of their residency outcomes (ie. Entrustable Professional Activities), and completes the clinical rotations mandated by their program, they received their RCPSC certification and can seek employment as a practicing Pathologist.

The Role of Pathologists in the Canadian Healthcare System

Pathologists are integral to the Canadian healthcare system and play a decisive role in disease diagnosis, patient care, and public health. They collaborate with other healthcare professionals to provide accurate diagnostic information and consult with other physicians to assist in making informed decisions about patient care based on these diagnostic findings. In addition to these key clinical tasks, Pathologists also often engage in research, contributing to the understanding of diseases, diagnostic techniques, and treatment options. In order to maintain RCPSC certification in Canada, Pathologists must undertake continuing professional education (CPE) activities and submit their annual CPE hours to the Royal College.

Pathology Summary

Pathology residency training in Canada is a demanding and comprehensive program that equips its learners with the skills and knowledge necessary to succeed in this diagnostic-focused

medical specialty. Pathologists play a key role in diagnosing diseases, contributing to patient care, and advancing medical knowledge through research. With their expertise and central role in the healthcare system, Pathologists contribute significantly to the health and well-being of Canadians.

Research Questions

My study aimed to address the question “What are the experiences of learners in a diagnostic-focused Canadian residency training program that has introduced a competency-based medical education (CBME) curriculum approach?”. The objectives of my study were to: 1. Inform the study of professional education programs by giving voice to the learner experience within programs that have a mandated outcomes-based curriculum (in this case in the form of CBME); and 2. Provide insight into learner-centered education in this context from an adult education perspective.

Overview of Research Paradigm

Research paradigms provide the foundational worldview that shapes the research process, influencing design, data collection, and interpretation of data (Creswell & Poth, 2016; Kivunja & Kuyini, 2017). In this study, an interpretivist paradigm was employed to explore the subjective experiences of individuals within their social and cultural contexts. Grounded in the belief that reality is socially constructed and that meaning is derived through interactions with the world, interpretivism emphasizes the importance of understanding participants’ perspectives and lived experiences (Creswell & Poth, 2016). In the context of this dissertation, which focuses on residents in a competency-based medical education (CBME) program, interpretivism provides a framework for exploring how residents interpret their learning experiences, professional identity development, and the feedback they receive. This paradigm supports an in-depth understanding

of how residents make sense of their journey through a highly structured and performance-driven educational model, offering insights into how individual interpretations of competency and success are formed within this context.

Overview of Theoretical Framework

A theoretical framework provides a blueprint for inquiry and “serves as the guide on which to build and support your study” (Grant & Osanloo, 2014, p. 13). This study is guided by and situated in adult education and lifelong learning theory. Andragogy, or the study of adult education, provides a theoretical framework for understanding how individuals continue to acquire knowledge and skills throughout their lives, and in professional settings such as competency-based medical education (CBME) programs. This framework emphasizes that learning is a continuous, dynamic process influenced by personal experiences, intrinsic motivation, and social context (Merriam & Baumgartner, 2020). In the context of adult learners participating in a CBME program, lifelong learning is essential to their development as physicians, as it encourages ongoing professional growth and adaptation to the ever-evolving medical field. This framework focuses on the learner’s autonomy, self-directedness, and the integration of theory into practice. By adopting this perspective, this dissertation will explore how medical residents engage as adult learners within their educational program and how these experiences shape both their clinical competencies and personal development as healthcare providers.

Overview of Methodology

Using Stake’s (1995) approach to case study, I employed a qualitative instrumental case study to garner the knowledge required to answer my research questions and fulfill my objectives. To develop new knowledge, my research approach first involved obtaining Research

Ethics Board approval from my home university in November 2022. Following approval, in January and February 2023, I proceeded to undertake a document review where I analyzed program-specific and Royal College-produced materials with a competence by design (CBD) focus. These documents ranged from quick reference guides on Pathology's Entrustable Professional Activities (EPAs) to PowerPoint slide decks on the Royal College's orientation to CBD. Reviewing these documents gave me added context to the current educational landscape for CBD learners before I spoke with them. In March 2023, I conducted an in-person focus group with all six participants. Of the six participants, two were Anatomical Pathology residents and four were General Pathology residents. Following the focus group, I reviewed the transcript and made broad notes about my general impressions and thoughts. From there, I made separate notes for each participants' contributions which helped inform the approach to each individual interview. Between March and May 2023, I met with each individual participant to interview them and discuss their experiences as a CBD learner more in-depth. I used my semi-structured interview guide as a starting point, modifying it for each participant based on the topics and insights they contributed during the focus group. From here I was able to review and code the notes made from document analysis, the focus group transcript, interview transcripts, and my researcher notes from journaling to undertake a thematic analysis. This analysis eventually garnered five semantic and one overarching latent theme. An in-depth account of the components of my study's methodology follows in chapter 3.

Dissertation Overview

To fully examine in detail the topic of this study which explores the experiences of Pathology residents in a competence by design program, this dissertation is presented in five chapters, following this introductory chapter. Chapter 2, the Literature Review, provides a brief

history of medical education and a review of adult learning theory in the context of medical education, along with an overview of healthcare education programs. Current critiques of competency-based and outcomes-based education are explored, as are the critiques of competency-based medical education.

Chapter 3, the Methodology chapter, provides a detailed description of the study's research design and reasoning for undertaking the study in the way I did. It describes the use of an instrumental qualitative case study design, document analysis, focus groups, participant interviews, and researcher journaling. It also provides insight into the reflexive thematic analysis process which was used to aid in the exploration and development of the study's themes.

Chapter 4, a Document Analysis chapter, allows for a detailed exploration of the various program-specific and Royal College resources for learners and faculty on the topic of competency-based medical education. It provides the reader with a context of the resources that are circulated within a department and those that are publicly available online.

Chapter 5, the Further Research Findings and Data Analysis chapter, explores the participant research undertaken for this study, including a focus group and individual interviews with each participant. From there, the five semantic and one overarching latent theme that arose from this study are detailed. Each theme is explored with accompanying data and explanation of its importance.

In Chapter 6, the Discussion chapter, each theme and its potential impact is discussed using an adult education and professional education lens. Theoretical and practical implications are explored from the intersection of research and practice. Insights into how this study adds to the existing knowledge on outcomes-based and competency-based education are provided.

Chapter Summary

In this chapter, I presented an overview of my research study including research rationale and research questions with objectives. I provided an overview of the current landscape of medical education in Canada, presented the nuances of diagnostic-focused versus procedural-focused specialty residency programs, and discussed Pathology residency training in Canada. I also positioned myself as the researcher within the study and provided a brief chapter summary for each chapter that follows. In chapter 2 this conversation continues with a literature review.

Chapter 2: Literature Review

In this chapter, I undertake a review of relevant literature to help gain further insight into the learner experience in outcomes-based or competency-based education programs. I provide a brief history of medical education and discuss its intersection with adult education. An exploration of competency- or outcomes-based education is offered, incorporating relevant critiques of such a framework in medical and professional education.

Ahead of my literature review, I knew that competency-based medical education (CBME) continued to be an emerging field of discourse in Canada. And though the impact this curricular approach has on learners had not been widely researched or understood from an andragogical perspective, the medical education community tended to support it because it is believed that it better suits the needs of the medical community and current societal demands (Ryan et al., 2022). Although initially touted as an exciting new curriculum framework that would cure many medical education and societal ailments, it was clear that the reality of implementing a new curricular design across many programs and unique learning environments had challenges. I hoped that my literature review would assist in adding context to the current understanding of CBME and help to situate my study's research.

The comprehensive literature review follows, beginning with a brief history of medical education before delving into the current landscape of outcomes-based education programs and competency-based medical education.

A Brief History of Medical Education

Medical education's roots can be found in what we now call apprenticeship training. As Hodges (2005) explains, in the colonial period formal medical training was reserved for an elite few in the medieval universities of the United Kingdom, France, Germany, and Austria.

However, months or years-long apprenticeship training which facilitated the passing of practices from mentor to mentee in aspects of medicine existed in “many different groups, including midwives, barber-surgeons, apothecaries, bone-setters and clergy” (p. 39). It was following the Enlightenment period that medical practice moved from a primitive, barbaric practice to one based in science and rationality (Flexner, 1925).

In the late 19th and 20th century, medical education made its way to North America and saw a rise in clinical teaching, the use of a clinical-pathological model of diagnosis, and effective therapeutics (Hodges, 2005). While this benefited population health, Marxists such as Brown (1979) cautioned that medical schools were linked to power, prestige, wealth, and often linked to influential philanthropic organizations. One such example Brown cites is how The Carnegie Foundation commissioned science administrator and politician Alexander Flexner to write a status report on medical education in the United States and Canada in 1910. Flexner’s report disrupted the medical education landscape in North America by influencing the public’s perception on what should be deemed as acceptable medical training. He reviewed the 155 medical schools in operation in Canada and the United States at the time and gave the public their first understanding of what happened at these institutions behind closed doors (Ludmerer, 2010). According to Flexner, the laboratory- and clinical-based practice Johns Hopkins University employed was paramount, claiming that anything exploratory or more homeopathic in nature was unfounded and unsanitary (Stahnisch & Verhoef, 2012).

Although medical schools had already started to emulate Johns Hopkins’ model of medical education, the Flexner Report was a turning point in mobilizing funds in order to standardize practices across the institutions that remained operational in the wake of Flexner’s exposition (Ludmerer, 2010). Ludmerer explains that the Flexner Report was the catalyst for

broad curricular reform in medical education, with Flexner's guiding propositions of medical positivism, rigorous entrance requirements, applying scientific method to medical practice, learning by doing, and emphasis on original research shaping medical education throughout the 20th century. These criteria were met by following a curriculum design of two years of basic science education and two years of clinical training exposure for an Undergraduate medical degree, followed by Postgraduate apprenticeship training in a residency program.

Although seen as a watershed moment at the time, some critics contend that the Flexner Report has contributed to enduring issues within medical education. One major criticism is its promotion of a predominantly biomedical model, which tends to emphasize disease pathology over holistic patient care. This narrow focus can detract from essential skills such as interpersonal communication and empathy, leading to a hidden curriculum that Schrewe (2013) explains fosters a culture of hierarchy and competition instead of collaboration. Additionally, the report's rigid educational structure has marginalized alternative pathways to medical training, disproportionately affecting underrepresented groups. Hogan (2024) highlights how the report led to the closure of all but two African American medical schools, reinforcing systemic inequities and limiting opportunities for minority students.

Moreover, the Flexner Report's endorsement of research as a cornerstone of medical education has fostered a culture that can undervalue community-oriented practices and primary care. This has resulted in a trend toward specialization that exacerbates the shortage of primary care providers, impacting healthcare access for diverse populations. Buja (2019) remarked that the specialization encouraged by the Flexner Report has contributed to a disconnect between physicians and the communities they serve, entrenching existing healthcare disparities.

During the same era that saw Flexner's vision of medical education rise to popularity, Sir William Osler's contributions to medical education were equally transformative. Osler championed the integration of bedside teaching, shifting the focus from theoretical classroom instruction to learning directly from patient care. This practical, hands-on approach reflected an early form of what would later become competency-based medical education (CBME) principles: learning through experience and demonstrating clinical competence in real-world settings (Osler, 1905).

In the establishment of bedside teaching, Osler believed that medical education should not be confined to lecture halls but should take place in the presence of patients, where students could observe and practice clinical skills directly. As Sturgeon (2023) notes, Osler famously stated that, *the practice of medicine is an art, based on science*, underscoring the idea that understanding the science behind medicine is crucial, but it must be complemented by the art of patient care. His teaching philosophy encouraged medical students to learn by doing, thus fostering critical thinking and clinical reasoning skills. Scholars have noted that this approach laid the groundwork for modern clinical education, which prioritizes hands-on learning and real-world experience (Sturgeon, 2023). Also of notable mention was Osler's commitment to the patient experience. As Delcea and Buzea (2024) explain, Osler emphasized the importance of compassion and empathy in the doctor-patient relationship, encouraging medical students to consider not just the disease but also the person experiencing the illness. This emphasis on humanity in medicine is evident in his famous adage, "the good physician treats the disease; the great physician treats the patient who has the disease" (Delcea & Buzea, 2024, p. 2). His recognition of the value of patient narratives and the doctor's role in understanding these

narratives has been noted as a precursor to contemporary practices that advocate for patient-centered care.

Lastly, Osler also championed the concept of lifelong learning for physicians, arguing that medical education should not end with graduation but should continue throughout one's career. He believed that medicine is an ever-evolving field and that physicians must remain curious and committed to continuous self-education. This idea resonated throughout the medical community and is reflected in today's emphasis on continuing medical education and professional development (Leach & Coleman, 2019). In sum, Sir William Osler's contributions to medical education are vast and multifaceted. His legacy of emphasizing blending the art and science of medicine has shaped how medical education is approached, ensuring that physicians are not only knowledgeable but also compassionate caregivers. This has had a lasting impact on medical education as we know it today.

Medical Education in the Post-Flexner Report and Post-Osler Era

Following the Flexner Report and Osler's impact on enhanced patient focus, public interest and concern in the training of competent physicians did not wane. As a result of Flexner's report, medical education became more structured and standardized. However, training was still largely time-based and reliant on accumulating knowledge over fixed periods rather than explicitly defined competencies. The roots of CBME started to emerge in the 1960s and 1970s as educational theorists began to challenge traditional models. Notably, William McGaghie, George Miller, and others advocated for medical education to move toward an outcomes-based approach where the demonstration of key competencies would become the focus (McGaghie et al., 1978). This period saw the growing realization that mere exposure to clinical settings was insufficient unless specific competencies were defined, taught, and evaluated. In the

1970s, discussion of physician competence and defining competency began to become more prominent in medical education literature with varying degrees of interest and conceptualization (Carraccio et al., 2002). There was also interest from Public Health leaders for “competency-based training, and ... a workforce equipped to handle the population’s needs by emphasizing competence in the context of the practice setting” (Carraccio et al., 2002, p. 362). Carraccio notes that, despite this increased pressure, the interest in competency-based medical education of this era eventually diminished likely due to a lack of specific competencies linked to curriculum objectives and a void in evaluation tools.

What is Competency-Based Medical Education?

Competency-based medical education (CBME) is residency education’s iteration of an outcomes-based education (OBE) framework. Defined by Frank et al. in 2010 as “an outcomes-based approach to the design, implementation, assessment, and evaluation of medical education programs, using an organizing framework of competencies” (p. 636), CBME presents as a workplace-based OBE program. However, in 2021, Sherbino et al. cautioned that this definition is not broadly understood or accepted by the stakeholders involved in CBME programs. While undertaking a qualitative study to determine users’ perceptions of CBME in Canada, Sherbino and colleagues found that nuances in participants’ experiences and roles within the framework affected how they defined and perceived CBME’s programmatic elements. Of note, a number of participants expressed concern for the reductionist nature of a competency-based framework which reduces a specialty to lists of outcomes. They also expressed concern about learner well-being with the perception of learners constantly being observed and critiqued. Interestingly, there were no learner participants in the study.

Beyond assessments, a key feature of CBME in Canada is the progression of learners through sequenced stages of training. Initially intended to have learners progress through at their own pace, the stages of training were a more holistic way to view residency training than traditional postgraduate year (PGY) levels (Frank et al., 2024). For example, a first-year medical resident is known as a PGY1. In a competency-based program, they enter as a learner in the transition to discipline stage of training. From there, they progress to the foundations of discipline stage, then the core of discipline stage, and finally the transition to practice stage of training when they are in their last year of their program (usually a PGY5 for Royal College specialties). To progress through the various stages of training, a learner must complete all outcomes (also known as Entrustable Professional Activities in CBME), documenting achievement via evaluation forms completed by a faculty member or other approved assessor. Frank et al. (2024) explain that, ultimately, the Royal College's approach to CBME, coined Competence by Design (CBD), marries the traditional PGY level and CBME stage of training so that learners bear both classifications of traineeship in this outcomes-based education (OBE) program. An overview of OBE is provided below, followed by a summary of the implementation of CBME in Canada.

An Introduction to Outcomes-Based Education

Outcomes-based education (OBE), also known as competency-based education (CBE), is an educational framework that defines the specific skills and knowledge that learners should aim to demonstrate at the end of an educational experience or program. OBE has seen significant implementation across various educational curricula, particularly in professional and healthcare education programs. Particularly in professional development programs, OBE is used to design training that meets specific job-related or workplace competencies. For example, in nursing

education, OBE frameworks ensure that training programs produce graduates who meet professional standards and can provide high-quality patient care (Frenk et al., 2010). In 2023, Rojo and colleagues undertook a review of nursing school programs that incorporated transformative learning theory in their development and implementation. Of the 12 examples they found and reviewed, nine programs used immersive fieldwork to enable deep learning and seven used group work to foster critical reflection, an understanding of teamwork and professional roles, and communication. Nine of the studies reported students exhibiting transformative learning outcomes as a result of incorporating the theory into the curriculum.

A learner-centered approach, which emphasizes active involvement and engagement of learners, is a cornerstone of OBE. Tuomainen (2023) notes that a learner-centered approach recognizes that learners are active participants in their education who bring their prior knowledge, experiences, and learning styles into the classroom. This approach aligns with the constructivist theory of learning, which suggests that learners construct their understanding and knowledge of the world through experiences and reflection (Kolb, 2014). Theoretically, by focusing on the needs and experiences of learners, OBE can create a more engaging, inclusive, and effective educational environment, ultimately leading to better learning outcomes (Tuomainen, 2023). However, this is not always the case. Outcomes-based education is noted as being difficult to implement and not always as learner-centered in practice as it is in theory. Critiques of competency or outcomes-based frameworks include concerns about how the approaches are translated into practice by faculty, noting that there may be a tendency for some teachers to take a reductionist approach and just focus on the listed competencies within the framework and exclude other fundamental information that is not explicitly stated in the framework documents (Barman et al., 2014). Jackson and White (2020) caution that, if faculty

focus too much on an outcomes-based or a behaviorism-based curriculum, student engagement and critical thinking are diminished. This is echoed by Humphreys et al. (2018) who note that mandated competencies should be rooted in real-life on-the-job experiences as much as possible to enhance a learner's professional readiness. Further critique and discussion on this topic is provided in relation to adult learning theory later in this chapter.

The Evolution of CBME in Canada

By 1996, the Royal College had developed and released an overarching framework of competencies that they believed every physician in Canada should embody. This CanMEDS physician competency framework was updated in 2005 and 2015 and is comprised of seven roles “that lead to optimal physician performance, care delivery and health care outcomes. These roles include: Medical Expert (central Role), Communicator, Collaborator, Leader (formerly Manager), Health Advocate, Scholar and Professional” (Royal College of Physicians and Surgeons of Canada, para. 2, 2022). The Royal College notes that the CanMEDS framework became the new foundation for accreditation of specialty programs and certification of specialty physicians in Canada. And as such, it also provided a baseline standard of training for all specialty residency programs. Similarly, in 1999, the Accreditation Council for Graduate Medical Education (ACGME) and the American Board of Medical Specialties (ABMS) adopted competencies for standards of training in six domains: patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism, and systems-based practice (Carraccio & Englander, 2013).

Notably, in 2008, the Faculty of Medicine at the University of Toronto applied for Fundamental Innovation in Residency Education (FIRE) approval from the Royal College to transition their Orthopedic Surgery program to a competency-based medical education program.

FIRE is a designation awarded to innovative residency programs or educational initiatives that demonstrate new approaches to medical education. The FIRE initiative was part of the Royal College's broader efforts to encourage innovation in residency training and promote advancements that enhance the learning experiences of residents (Harris et al., 2020). After gaining approval, they introduced a CBME framework for the 2009-2010 academic year known as competency-based curriculum (CBC) (Harris et al., 2020). In the competency-based curriculum model, learners progressed through 21 modules with various competencies needing to be achieved in one module before progressing to the next. Harris et al. note that this design initially saw two thirds of the program's learners graduating in 4 years rather than the standard 5 years. The learners who stayed in the program for 5 years noted that they enjoyed the slower pace of competency fulfillment. Harris et al. (2020) went on to explain that the University of Toronto's Orthopedic Surgery program garnered much praise for their competency-based curriculum design and "enhanced feedback and assessment processes" (p. 683). However, they did face challenges such as effective faculty development, learner engagement, and development of online feedback and assessment software.

Eventually, in 2009, the International Competency-based Medical Education Collaborators (ICBMEC) group was formed with Dr. Jason Frank of the Royal College at the helm. Their aim was to develop competency-based approaches to medical education via a scholarly network (Frank et al., 2017). The ICBMEC published their first set of papers in 2010, the same year that Family Medicine programs in Canada, governed by their own college, transitioned to a competency-based framework (Dagnone, 2019). During this time, CBME continued to garner interest from medical educators but uncertainty from faculty teachers. As Carraccio and Englander explained in 2013, despite dissent, the continued interest in moving

forward in introducing a CBME framework in medical education could be attributed to “1) the power of regulatory bodies in requiring its implementation, 2) the expanding adoption of the competency framework worldwide, and 3) the outcry from the public about physician accountability and quality of care” (p. 1067).

Accordingly, the Royal College adopted a plan to begin transitioning all specialty residency training programs, via a phased approach over 7 years, to a competency-based medical education curriculum in the form of competence by design beginning in 2014 (Dagnone, 2019). The first programs to complete their planning and curriculum designs in this phased approach were Anesthesia and Otolaryngology, officially beginning their competence by design curriculum on July 1, 2017.

Decidedly eager to engage in the emerging competence by design framework, Queen’s University obtained FIRE approval in 2015 to transition the entirety of its 29 residency training programs to a CBD framework on July 1, 2017 (Dagnone et al., 2019). In order to facilitate this transition of practice, significant resources were mobilized, including a central planning team with a number of sub-committees and 29 program teams each comprised of “a program director, a specific CBME lead, a part-time educational consultant, a CBME resident lead, and a program administrator” (Harris et al., 2020, p. 683). Dagnone and colleagues (2019) acknowledged that this was both a rewarding and challenging process noting that, among the lessons learned, the terms and concepts involved in a CBME framework can be cumbersome and take time for faculty and learners to grasp. Consequently, ongoing emergent “program specific ‘just in time’ faculty development and resident development sessions, as well as understanding gained through program evaluation processes [must occur]” (p. 36). Because of the substantial attention required

to the ongoing education of learners and faculty as learners, transitioning to a CBME framework should be of acute andragogical interest.

The Current Status of CBME Implementation in Practice

Competency-based medical education has now been introduced in residency training programs in many countries, including Family Medicine and 61 specialty programs in Canada, with the remaining six specialty programs primed to introduce a competency-based framework between 2024-2025 (Royal College of Physicians and Surgeons of Canada, 2021). Family Medicine, which is governed by the College of Family Physicians of Canada, had a fairly swift implementation process for their competency-based curriculum. The Triple C Curriculum, based on a CanMEDS-FM competency framework, was initially introduced in 2010, with all 17 medical schools in a Family Medicine program in Canada transitioning to the curriculum shortly thereafter (Zhang et al., 2019). However, the staged implementation of CBME in Canadian specialty programs has been slow and not without setbacks. The Royal College had initially planned for six specialty programs to transition to their Competence by Design framework in July 2015. This was quickly put on hold and moved to July 2016. Then, in December 2015, Dr. Ken Harris, then Executive Director of Specialty Education with the RCPSC, circulated an email to all members of the medical education community in Canada noting that the implementation date for the first cohort of residency training programs transitioning to Competence by Design would be delayed from July 1, 2016 because they “received feedback from our medical school partners expressing logistical, technology and resource concerns with the existing implementation model and timeline” (para. 3). In other words, implementation of CBD was not as straightforward as anticipated, with many administrative details needing to be addressed before implementation could proceed.

At that time, it became clear that a standardized competency framework imposed on professional medical education programs may not quite fit every program, as the context of learning and trainee experience varies due to geographical location and institutional variances within which training programs operate. Furthermore, as seen in other health education professional programs that have transitioned to a competency-based curriculum (Groccia & Ford, 2020; Hornsby & Wright, 2020), it was clear that it would take longer to bring faculty onboard with the new ideas and tasks involved in successfully introducing a competency-based framework. As Holmboe (2018) acknowledges, “paradigm shifts are messy and threatening, both for those wanting to remain with the older paradigm and those pushing the newer paradigm” (p. 351). The faculty leaders who were eager to have programs use a CBME approach had to quell their excitement and accept a slower way forward to further educate and support the medical education community through the curriculum change.

The COVID-19 global pandemic declared in March 2020 has affected how CBME looks in practice over the past number of years. As Ryan et al. (2022) explain, the pandemic saw residents being redeployed to intensive care units and emergency rooms, changes to certification exams, a shift to virtual teaching sessions and conferences, and an increase in stress and burnout. What this meant in practice was that learners had fewer opportunities to achieve competencies in their home programs and spent less time with their peers and interprofessional colleagues, all the while having to navigate new learning demands. Special pandemic clinical rotations were created to ensure resident’s experiences could still count towards their learning outcomes and learners quickly became part of an online learning and working environment (Hall et al., 2020). For programs that had already transitioned to CBME, Arrighi and colleagues (2021) and Caretta-Weyer and colleagues (2021) explain that having an outcomes-based framework during the

pandemic was helpful for learners and the healthcare system since it provided the flexibility for learners to participate in redeployment activities as needed while not being tied to a time-based curriculum. As echoed by Caretta Weyer et al. (2021), this ongoing learner flexibility to meet program outcomes in both CBME and non-CBME programs would be paramount in supporting learner success as medical education explores what educational experiences will look like beyond the pandemic.

Now in 2024, more than 10 years after the initial introduction of competency-based medical education in Canada, it is clear that a widespread change of practice can be onerous and continuous quality improvement is necessary for programmatic success. As Hall et al. (2024) note, the competence by design (CBD) team at the Royal College have introduced an ongoing systematic program evaluation framework to foster adaptation and improvement. The team acknowledges that there are many variables and contextual factors that contribute to an individual residency training program's success or challenges in a competency-based framework. Hall et al. explain that:

It seems that culture change will take time and a sustained collective effort through the transformation process; and efforts required will certainly be variable depending on a host of local contextual factors. Getting the structures, processes, and policies in place may be the first step, but continued quality improvement with iterative revision and adaptation of educational designs may lead to the desired mindset changes in programs and disciplines. (p. 102)

In other words, implementation of CBD does not simply stop at providing programs with a contextual framework. The actual success of the competency-based model goes far beyond the administrative details and must account for the variances and nuances of several diverse

programs. This need for flexibility and iterative quality improvement has become the current chapter of what CBD looks like in Canada.

The Current Status of Medical Education in Canada

As noted above, one of the most significant modern-day shifts in medical education is the move towards competency-based medical education (CBME). However, medical education continues to be an evolving field beyond CBME in both pedagogy and practice. Beyond CBME, central to the current field is the integration of active learning strategies and interprofessional education (both explored further in the *Professional Healthcare Education* section to come), and a growing focus on social determinants of health (SDOH) and global health which are introduced below.

Focus on Social Determinants of Health

In recent years, there has been an increased emphasis on teaching medical students and residents about the social determinants of health (SDOH). These are the non-clinical factors such as socioeconomic status, education, and environment that significantly influence health outcomes. Lapite and colleagues (2021) explain that by understanding these determinants, future physicians are better prepared to address health disparities and provide more equitable care. This focus is reflected in curricular changes that may include courses or modules on public health, social medicine, and community engagement, and encouraging learners to think beyond the clinic and consider the broader context of their patients' lives (Lapite et al., 2021). It is also reflected in the emphasis to recruit learners from varied socioeconomic and cultural backgrounds in order to bring diversity to the health professions (Beagan et al., 2022). This notion of conceptualizing the physician's role beyond the clinical realm is further reflected in the interest in global health in medical education.

However, the Royal College has faced challenges in integrating anti-racism and anti-oppression perspectives into CBME. A major obstacle is the legacy of systemic racism that has historically shaped medical education, which leads to resistance in making substantial changes. Existing frameworks like CanMEDS were not originally designed with anti-racism in mind, and developing reliable assessment tools to evaluate competencies such as recognizing bias, addressing health disparities, and providing culturally safe care remains a persistent challenge (Barnabe et al., 2023). Institutional commitment and accountability also present barriers to integrating anti-racism into CBME. As Warnock and colleagues (2023) note, without robust systems of accountability, anti-racism efforts risk being seen as performative, rather than driving real change. Resource limitations, including a lack of funding and support for faculty and learners, especially those from marginalized groups, further complicate these efforts (Warnock et al., 2023).

Global Health and Public Health Preparedness

The COVID-19 pandemic has brought global health and public health preparedness to the forefront of medical education. Medical schools are increasingly incorporating global health perspectives into their curricula, teaching students about epidemiology, public health policy, and the global burden of disease (ISNUK Collaborative, 2020). This education is crucial for preparing physicians to respond to global health crises and to understand the interconnectedness of health systems worldwide (Rose, 2020). Additionally, there is a focus on equipping learners with the social accountability skills needed to manage public health emergencies, such as risk communication, resource allocation, and ethical decision-making in crisis situations (Barber et al., 2020). This training is designed to ensure that future physicians are equipped to take on

leadership roles in public health and contribute to the development and implementation of effective public health policies.

Moreover, systems thinking is becoming a key component of medical education, encouraging learners to understand the healthcare system as part of a larger, interconnected network. This perspective is particularly important in the context of global health, where the actions of one country or health system can have far-reaching effects on others. Lucey et al. (2022) explain that, by fostering a systems-oriented mindset, medical education can aim to support physicians' critical thinking about the broader impacts of their work and can contribute to building more resilient and sustainable health systems.

Today's medical education landscape is defined by an intention to develop physicians who are not only clinically competent but also capable of addressing the broader social and global challenges they will encounter. This aligns with professional education moving beyond functionalism to a more pluralist focus with a practitioner's responsible practice at the forefront (Bierema, 2018). However, current intention aside, medical education fundamentally aims to prepare physicians for professional roles in the workforce. An introduction to professional healthcare education is discussed further below.

Professional Healthcare Education

Professional learning programs evolved alongside economic development and growth over the past century, with skilled workers being central to productivity and financial outcomes of corporations (Fletcher, 2015). A branch of professional education is healthcare education which is concerned with the education and continuing education of healthcare professionals (Coady, 2021). Programs such as nursing, physiotherapy, pharmacy, dietetics, and medical education make up the collection of professional education programs under the umbrella of

healthcare education. As Groccia and Ford (2020) explain, the “evolution of healthcare and healthcare education in human medicine, pharmacy and nursing shows a similar pattern of a start-and-stop progression from amateurism to professionalization” (p. 26). As healthcare professionals, these learners are educated in a way that equips them to effectively operate in today’s multi-faceted healthcare system while enhancing patient safety and care (Coady, 2021; Groccia & Ford, 2020). Current trends in professional healthcare education including interprofessional education, simulation education, cultural competence and diversity are introduced below.

Interprofessional Education

One of the concerns of health and adult education scholars has been in interprofessional education which usually occurs once learners have entered the formal workforce. Yet with graduate students like medical students and residents, interprofessional education is part of their training as they are educated with other healthcare students and work with other healthcare staff in medical settings. Patient care is enhanced when medical education learners and faculty work collaboratively with other healthcare colleagues on their clinical teams (Babenko & Lee, 2022; Jarvis-Selinger et al., 2012; Noble et al., 2019). The interest in and benefit of well-functioning interprofessional health teams is a current area of focus in health and adult education. Freeth et al. (2019) explain that a healthcare student’s learning is shaped by explicit messaging like course outlines and competency documents, and implicit messaging like the perceived importance of learning activities, the attendance of particular healthcare groups at learning events and the room in which learning activities take place; collectively, these messages comprise the hidden curriculum in a learning environment. As MacLeod (2014) notes, the hidden curriculum refers to the informal and often unspoken lessons that students learn during their training, which can

profoundly influence their professional identity and values. These hidden aspects of learning can perpetuate certain norms, values, and power dynamics within the medical profession, sometimes in ways that conflict with the formal curriculum's objectives. Within this environment, learners come to know what their role is on the healthcare team and what it means to be a physician, aiding in their professional identity formation. Interprofessional education can be helped or hindered by these explicit and implicit ideas, so they need to be considered by educators.

As Leo and Clark (2020) explain, much of the learning which takes place in a healthcare workplace is informal and unstructured. It is through these informal interactions where trust can be built to overcome traditional healthcare cognitive and professional boundaries (King & Shaw, 2022). Interprofessional teams have also been shown to enhance resilience in healthcare teams when navigating challenging situations such as the COVID-19 pandemic (Coady, 2024). As Coady notes, having a well-functioning supportive network of healthcare professionals with shared collective knowledge allows for an adaptive capacity in times of uncertainty.

Additionally, according to King and Shaw (2022), when afforded the opportunity to interact with their interprofessional colleagues in an informal setting such as over lunch in a break room, health professionals experience identity development and enhanced learning. Their study suggests that informal interactions amongst allied health professionals “confer[s] multiple individual benefits such as broadened perspectives, job satisfaction, a sense of personal and professional satisfaction, joy at work and more opportunities to debrief with colleagues” (p. 58). In a 2022 study, O’Brien and English found that not only are informal interactions valued by healthcare teams and assist in building trust and shared values but being afforded a formal structure of interaction via regular meetings, case conferences, and purposeful spaces to connect with colleagues is beneficial to creating a “culture of learning” (p. 75). This cultivation of

learning via intentional activities and spaces fosters connections and conversations between individuals that may not have occurred otherwise. Another structured opportunity for collaboration is through continuing professional development (CPD) that not only focuses on individual professional development but also on fostering collaborative skills among team members. Coady (2016) explains that education scholars have advocated for CPD programs that are designed to enhance interprofessional collaboration, recognizing its role in fostering communities of practice and cultivating robust healthcare teams.

It is these formal and informal interactions with their healthcare colleagues in which learners experience important role identity development and non-clinical ways of knowing to be physicians. As such, interprofessional teams benefit not only patient care but also the healthcare professionals who are a part of them.

Simulation-based Education

Simulation-based education has emerged as a significant component in the training of healthcare professionals, providing a realistic and controlled environment where learners can practice and refine clinical skills. Over recent years, the use of simulation in healthcare education has expanded significantly, driven by its effectiveness in improving clinical competence, confidence, and patient safety. Additionally, dovetailing from the section above, simulation has been shown to enhance interprofessional education. Barton et al. (2023) note that simulation exercises that include participants from interprofessional domains promote collaboration and communication among healthcare teams. These exercises prepare students for real-world clinical environments where teamwork and effective communication are essential for patient care.

A 2013 review by Motola et al. found that simulation-based training improves educational outcomes by allowing learners to engage in hands-on practice without the risk of

harming patients. They cite that the repeated practice of various clinical scenarios and skills, and immediate feedback are enablers of a deeper understanding of clinical procedures, and the development of critical thinking and decision-making skills. Further advancements in simulation technology have been documented by Macnamara et al. (2021), who explore the integration of high-fidelity simulations and virtual reality in medical education. High-fidelity simulations, which use sophisticated manikins and real-life scenarios, provide an immersive learning experience that closely mimics actual clinical settings. Virtual reality, on the other hand, offers a safe and interactive platform for students to practice complex procedures, such as surgery, in a highly detailed and controlled environment.

Recent literature also highlights the role of simulation in addressing specific educational needs, such as cultural competence and emergency preparedness. For instance, Gonzales-Walters et al. (2024) report that simulation scenarios designed to include culturally diverse patient cases, assist in students and healthcare workers developing cultural humility, sensitivity and competence. Similarly, emergency preparedness simulations, as described by Moslehi et al. (2022), train healthcare professionals to respond effectively to crises, improving patient outcomes in emergency situations. In Pathology, simulations are used to enhance learners' knowledge base and build competence. For example, having learners use 2D and 3D simulations of high-resolution pathology images and related histopathologies was shown to increase test scores on topic-related quizzes (Wan et al., 2022).

Cultural Competence and Diversity

A common thread in today's healthcare education landscape is the importance of cultural competence and diversity. Similarly, in adult education, there has been an increased interest in the sociocultural context of teaching and individuals' lives (Baumgartner, 2024). As James-

Gallaway and colleagues (2024) explain, North American learning environments have been historically entrenched in white privilege and patriarchy. This can also be said for traditional healthcare environments which are an integral component of healthcare education, essential for preparing healthcare professionals to provide equitable and effective care to diverse populations. Stubbe (2020) explains that, in order to instill cultural awareness, humility, and competence in healthcare learners, incorporating cultural competence into the curriculum through reflective practices and continuous education, is vital in a multicultural society. Walkowska et al. (2023) echo this sentiment, noting the effectiveness of simulation-based training in enhancing cultural competence among medical students. Simulation-based education (as introduced above) allows students to engage in realistic scenarios where they interact with patients from diverse cultural backgrounds, fostering empathy and understanding. Also introduced above, interprofessional education can play a vital role in cultural competence training. In a review in 2016, Echeverri and Chen note that, by learning alongside peers from different healthcare disciplines, students can better appreciate the role of cultural competence in collaborative practice, ultimately improving patient outcomes.

Furthermore, Mlambo et al. (2021) stress the need for continuous professional development in cultural competence. They suggest that healthcare professionals should engage in lifelong learning to stay updated on best practices and emerging issues related to cultural diversity. This ongoing education can help mitigate implicit biases and enhance the quality of care provided to patients from various cultural backgrounds. As part of this lifelong commitment, Greene-Moton and Minkler (2020) present the concept of cultural humility as an extension of cultural competence. They suggest that cultural humility involves a lifelong commitment to self-evaluation and self-critique to acknowledge and address power imbalances in patient-provider

relationships. This concept encourages healthcare professionals to view themselves as learners, ever evolving their understanding of cultural dynamics. As noted above, the integration of anti-racism and anti-oppression perspectives in CBME and the CanMEDS curriculum presents ongoing challenges but the focus on successful integration persists.

Outcomes-Based Education and Adult Learning Theory

The core principles of outcomes-based education and its relation to adult education theory are explored below.

Defining Clear Learning Outcomes

The basis of outcomes-based education (OBE) lies in defining clear and measurable learning outcomes that learners are expected to achieve by the end of a course or program. Defining these outcomes requires an understanding of what represents success in a professional field or subject area and, once developed, these outcomes guide the educational process, from curriculum design to assessment. They also provide a roadmap for learners, outlining what they need to achieve to succeed in their program of study. For educators, well-defined outcomes theoretically could assist in the formation of instructional strategies and assessment tools, ensuring consistency and transparency in the teaching-learning process (Tuomainen, 2023). As Daffron and Caffarella (2021) note, this transparency in learning outcomes is vital in ensuring the success of outcomes-based programs.

That being said, educational scholars have challenged competency-based models (Barman et al., 2014; Boyd et al., 2018; Coryell et al., 2024), highlighting that while they may raise the standards of technical competence (enabling higher levels of excellence), they devalue the emerging professionals' creativity and the ability to direct their own learning. Furthermore, the focus of objectives-based education's (OBE) focus can be seen as ignoring the learner at the

expense of the outcome. Gallagher (2014) warned that the prominent features of competency-based education, including “hyper-individualization, excessive specification, and top-down implantation” (p. 18), historically overshadowed “what should be regarded as the central enterprise of higher education: ongoing, engaged teaching and learning” (p. 19). In other words, the attention paid to the perceived benefits of competency-based education could surpass the attention paid to the actual learners and faculty in the programs. Florendo (2021) shares this concern, noting that far too often in outcomes-based education individual teachers and learners are more or less ignored, except as objects of regulation. They concluded that there is far too little research on the effects of outcomes-based education, which leaves much to be answered about the learner experience within such programs. This research gap still carries through into professional medical education programs, including residency training and nursing, today where much has been published on the design and implementation of an outcomes-based curriculum but literature on actual program effects is lacking (Alharbi, 2024).

Inverse Curriculum Design

An inverse curriculum design, where the planning of educational activities starts with the end goals or outcomes of a program, is a key aspect of OBE. Educators first identify the desired learning outcomes, which specify what learners should know, be able to do, and value by the end of the instructional period (Rao, 2020). From there, they determine what may be considered acceptable demonstrations of learning and develop assessment methods to measure this. Finally, educational activities and materials are designed to help learners achieve the required outcomes, typically in a progressive manner. This inverse design aims to ensure consistency in curriculum, instruction, and assessment, which should in turn create a structured and focused learning environment. However, in practice, Nordberg and Andreassen (2020) caution that multiple

stakeholders and varying agendas of institutions within which programs are designed and operate impact the ways in which professional education occurs. They explain that social and professional agendas, institutional agendas, and educational agendas are often in conflict with one another which can take the focus away from the fundamental property of the approach, the learner. Because of this, programs that implement outcomes-based education should be cautious in making similar claims or trying to over-specify each learner's path through training so that the learner's experience stays true to individual needs.

Ongoing Formative Assessment

From an adult education perspective, Hill (2020) explains that, for feedback to be effective, it must be timely, specific, personalized, meaningful, and intentional. It should guide adult learners on what they need to understand more deeply, how to refine their performance to meet defined standards, or how to refocus their efforts to enhance both learning and performance. Feedback enhances learning when it is “(a) focused on the key knowledge and skills students are to learn, (b) timed when students are most likely to benefit, and (c) linked to opportunities for further practice” (Hill, 2020, p. 22). In outcomes-based education programs, assessment is aimed to provide learners with timely ongoing feedback based on program outcomes and is explored further below.

Assessment in OBE is designed to be ongoing and formative, providing ongoing feedback that assists learners in their continuous development. This approach contrasts with traditional summative assessments that occur at the end of a course or unit which provide a final evaluation of a learner's abilities and/or performance. Huang and Zhang (2024) note that continuous assessment in OBE ensures that learners are provided with multiple opportunities to demonstrate their understanding and skills. They further explain that ongoing, formative

assessment involves regular, low-stakes assessments that give both learners and educators insight into learning progress, with a focus on identifying learning gaps and providing timely feedback that learners can use to enhance their performance. However, summative assessments still play a role in an OBE curriculum, as they can be used to evaluate the overall attainment of learning outcomes at the end of an educational period. These assessments are cumulative and provide a final summary of a learner's performance, such as final exams, cumulative projects, or comprehensive portfolios (Ali, 2024).

By incorporating both formative and summative assessments, OBE aims to create a well-rounded evaluation system that supports learning and development. According to Boud and Molloy (2013), OBE programs can help learners stay engaged, motivated, and focused on achieving learning outcomes, ultimately leading to higher levels of academic success and personal growth. However, it must be noted that this positivist approach to education has several potential implications. It encourages a scientific approach to education, where instructional strategies are designed and evaluated based on empirical evidence (Cabanas & González-Lamas, 2022). Cabanas and González-Lamas (2022) explain that this reliance on quantitative measures can be limiting, as it may overlook the complexities and nuances of the educational process. The emphasis on quantifiable outcomes can lead to a reductionist view of education, where the richness of the learning experience is overshadowed by the pursuit of standardized outcomes. This can devalue important aspects of education, such as critical thinking, creativity, and social development, which are more difficult to quantify (Saroyan, 2022). The aim of measuring, standardizing, and quantifying education has led to some scholars questioning the impact of neoliberalism in OBE.

Neoliberalism and Outcomes-based Education

Neoliberalism, characterized by market-driven principles, privatization, and an emphasis on accountability and performance, can have an impact on how educational systems operate and evolve. As Andrew (2024) explains, neoliberalism promotes the idea that education should be efficient, accountable, and aligned with the needs of the economy. And, in a neoliberal society, an outcomes-based approach to education enables control over knowledge and expertise in professional programs. It also encourages competition among educational institutions, often through market-based reforms, which are designed to increase the efficiency and quality of education (Ingleby, 2021). These reforms are prevalent in the adoption of OBE, where the emphasis is placed on clear, measurable outcomes used as a means to evaluate educational success. Another implication of neoliberalism on OBE is the increased focus on accountability and performance measurement. Schools and universities are often required to demonstrate their effectiveness through standardized testing and performance metrics (Lawrence & Rezai-Rashti, 2022). This accountability is intended to ensure that educational institutions deliver quality education and produce graduates who meet specific competencies required in the labor market. As a result, Lawrence and Rezai-Rashti (2022) explain that there is a shift toward performance-based funding models, where financial resources are allocated based on the achievement of predefined outcomes.

Curriculum Narrowing and Standardization

In OBE, the emphasis on measurable outcomes often leads to a narrowing of the curriculum. Moreover, Au (2011) explains that program areas that are not easily quantifiable such as in the arts and humanities, may receive less attention or be marginalized in favor of subjects that are more directly tied to economic productivity. This focus can result in a

standardized curriculum that prioritizes skills and knowledge deemed economically valuable, potentially limiting students' opportunities for a holistic education that includes critical thinking, creativity, and social awareness (Guggari et al., 2023).

Inequality and Access to Education

Neoliberal reforms in education often exacerbate existing inequalities because, as Orelus (2023) notes, the competitive nature of market-driven educational systems can disadvantage under-resourced institutions and communities, as they may lack the resources needed to achieve desired outcomes. This can lead to a gap between well-resourced and under-resourced institutions, perpetuating cycles of inequality and limiting access to quality education for marginalized groups (Rizvi & Lingard, 2010).

Additionally, the focus on economic outcomes and workforce readiness can neglect the broader social purposes of education. Neoliberalism's emphasis on individual responsibility and self-reliance can diminish the role of education in promoting social cohesion, equity, and democratic citizenship (Apple et al., 2023). Policymakers and educators should assess these implications to ensure that educational systems balance the demands of workforce and economic productivity with the need to provide a well-rounded and equitable education for all learners. In considering the broader implications of OBE programs, the intersection of OBE and adult education theory must be considered.

Adult Learning Theory in the Context of OBE

Outcomes-based education (OBE) aligns closely with some aspects of adult education theory, particularly those theories concerned with learner-centered approaches, experiential and self-directed learning, as well as learner empowerment. Key adult education theories that resonate with OBE principles include experiential learning, transformative learning, shared

agency and communities of practice. But first, a brief exploration of the alignment of OBE and andragogy.

Andragogy, the art and science of adult learning, is central to the design and implementation of OBE programs. Malcolm Knowles identified that adult learners are self-directed, bring a wealth of experience to their learning, are ready to learn things they find relevant, are problem-centered, and are motivated by internal factors (Knowles et al., 2015). OBE aligns with these principles by emphasizing clearly defined learning outcomes that are relevant and applicable to real-world scenarios, fostering intrinsic motivation. Yet, implementing OBE can be challenging for a number of reasons including resistance from participants used to more traditional educational methods, and the considerable effort that developing measurable learning outcomes requires. Successful implementation requires not only clearly defining learning outcomes, but also aligning a program's curriculum aspects with these outcomes and developing appropriate assessment methods to measure achievement (Tuomainen, 2023). Once these components are in place, all stakeholders need to understand and commit to the new approach. Daffron and Caffarella (2021) explains that resistance to change can be significant, particularly among educators accustomed to other teaching methods.

An OBE framework aspires to employ a learner-centered approach to education, as it considers the unique needs of adult learners in a particular area of study. As Merriam and Bierema (2013) explain, OBE not only enhances the relevance and effectiveness of adult education, but also empowers learners to take ownership of their educational journey, potentially resulting in more meaningful learning outcomes. However, in practice, it has been shown that a curriculum which relies on standardized assessment, such as OBE, may negate individuals' prior learning and experiences. It instead emphasizes standardized outcomes which may not account

for the diverse educational experiences and backgrounds of learners (Arnold et al., 2020). This can lead to a one-size-fits-all approach that overlooks individual learning needs and prior achievements. Incorporating and utilizing adult education theory in OBE can assist in overcoming challenges such as this. Adult education theory and its effect on learners in OBE programs is explored further below.

Experiential Learning

Experiential learning, a process where knowledge is created through the transformation of experience (Kolb, 2014), is an integral component of successful outcomes-based education (OBE) programs because learning outcomes are typically designed to be practical and applicable to a learner's use beyond their program of study. This approach aligns with Kolb's experiential learning cycle, which includes concrete experience, reflective observation, abstract conceptualization, and active experimentation. Educational activities in OBE aim to focus on equipping learners with skills and knowledge they can use beyond their program of study. Kolb explains that these experiential learning activities are central to achieving desired outcomes and allow learners to apply theoretical knowledge in practical contexts, thus enhancing their understanding and retention of the material. The alignment of OBE with experiential learning also supports the development of higher-order thinking skills. Tuomainen (2023) explains that, by engaging in hands-on experiences and reflecting on these experiences, learners can develop critical thinking, problem-solving, and decision-making skills.

In reality, experiential learning activities are often utilized to varying degrees of success because experiential learning in OBE is resource-intensive. Implementing experiential learning activities often requires considerable financial resources, time, and infrastructure. Institutions may need to invest in specialized equipment, materials, and training for instructors to facilitate

experiential activities effectively (Kolb & Kolb, 2022). Additionally, it can be challenging to integrate experiential learning within a traditional curriculum. Careful planning and coordination are required to balance the demands of experiential activities with the requirements of a structured curriculum. Educators may struggle to find the right balance between experiential and traditional teaching methods to ensure that learners meet learning outcomes while still receiving a comprehensive education (Aylward & Cronjé, 2022). However, when incorporated effectively, experiential learning practices can also be used as a tool in transformative learning.

Transformative Learning

Transformative learning, a theory developed in part by Jack Mezirow, focuses on the process of change in a person's frames of reference through critical reflection and discourse (Mezirow, 2018). This approach may be compatible with OBE, which aims to produce significant changes in learners' knowledge, skills, and attitudes by the end of an educational experience. In OBE, learning outcomes are essentially designed to be transformative, as they encourage learners to not only acquire information but also to critically reflect on their beliefs and assumptions while they undertake their studies. Hoggan and Kloubert (2020) note that this reflective process is central to transformative learning, where learners question and revise their perspectives based on new experiences and understandings. This intrinsic change is also an aim of the continuous feedback loop in OBE, which should allow learners to continuously learn and empower them to make changes to enhance their learning.

Yet, the limits of change are clear when there are predetermined outcomes and there is little flexibility in the OBE system for educators and learner input. This lack of flexibility can be a barrier to success, as transformative learning is inherently individualized, as it involves personal reflection and change. As a result, learning outcomes can vary among learners,

depending on their experiences, backgrounds, and willingness to engage in the transformative process (Illeris, 2014). This variability makes it challenging to ensure consistent achievement of specific outcomes across a diverse learner population, which is a central goal of OBE (Sanger, 2020). The diversity of learners and the accompanying cultural and contextual factors can also affect the success of an OBE curriculum. For example, as Merriam and Kim (2011) explain, students from collectivist cultures may prioritize group harmony over individual change, potentially limiting their engagement in transformative learning. Additionally, differing cultural norms and values can impact how learners respond to transformative learning experiences (Taylor & Cranton, 2012). Educators must be mindful of these factors and adapt their approaches to accommodate diverse student backgrounds.

Sharing Agency

Sharing agency in the context of OBE involves a collaborative approach where both educators and learners actively participate in the educational process. This partnership aims to foster a sense of ownership and responsibility among learners, with the onus for tracking and ensuring learning outcomes are achieved. In OBE programs, measurable outcomes are established but the ways in which they can be achieved are often flexible and can be negotiated between educators and learners. This participatory approach aligns with the principles of constructivist learning theories, which emphasize the importance of active engagement and personal relevance in the learning process (Tuomainen, 2023). By sharing agency, learners are encouraged to take an active role in their learning, to set personal goals, and choose learning activities that support their unique interests and needs (Merriam & Bierema, 2013).

This collaboration also supports the development of critical thinking and self-regulation skills. When learners are involved in decision-making processes regarding their education, they

learn to evaluate their progress, reflect on their learning experiences, and make adjustments as needed. This reflective practice is central to both OBE and adult learning theories (Knowles et al., 2015). However, shared agency may pose challenges, such as ensuring all learners are adequately prepared to take on this responsibility and managing diverse learner preferences and needs. Additionally, according to Bernacki and colleagues (2021), personalized learning paths may result in diverse learning experiences, complicating the process of measuring and comparing outcomes across learners. This variability can pose challenges for educators seeking to align learner agency with the structured assessment frameworks required by OBE. Effective administration and ongoing support for educators are necessary in addressing these challenges.

Ideally, sharing agency within OBE not only empowers learners but also enhances the relevance of their educational experiences, leading to more meaningful and enduring learning outcomes (Kolb, 2014). However, this empowerment does not only benefit learners. Sharing agency can further benefit a learner, their peers, and their educators when this power and knowledge is united in a community of practice.

Communities of Practice

Communities of practice (CoPs) in outcomes-based education (OBE) programs have the potential to enhance a learner's educational experience. CoPs, as defined by Wenger (1998), are groups of people who share a concern, a set of problems, or a passion about a topic, and deepen their knowledge and expertise in this area by interacting on an ongoing basis. Hefetz and Ben-Zvi (2020) explain that individuals come together in CoPs to meet a common set of needs. These needs represent individuals' intrinsic drive to enhance their physical and psychological well-being and foster personal growth. In the context of OBE, CoPs can play a central role in facilitating the achievement of learning outcomes through shared learning and experiences.

An OBE curriculum employs measurable learning outcomes and CoPs provide a structured yet flexible self-directed learning environment where individuals can engage in meaningful discussions, share experiences, and solve problems together that are related to these outcomes. As Abedini and colleagues (2024) explain, self-directed learning is integral to the organization of CoPs, as individuals with shared interests and motivations become members of the group. In an ideal situation, members are voluntary members of a CoP and are not motivated by mandated participation. This collaborative structure aligns with constructivist principles of learning, where knowledge is co-constructed through social interaction and reflection (Zajda, 2021). That being said, CoPs rely on the intrinsic motivation of their members where participants are responsible for driving their own learning and contributing to the community, which may not suit all learners (Hoadley, 2012). According to Pyrko et al. (2017), individuals with lower motivation or those who struggle with self-directed learning may not benefit as much from informal CoPs, which can in turn lead to potentially unequal learning benefit. Furthermore, access to informal CoPs can be limited by various factors, including geographical location, socio-economic status, and digital literacy (Mentis, 2022). Not all learners have equal opportunities to participate in or contribute to these communities, potentially exacerbating existing inequalities in education.

Within CoPs, learners benefit from the knowledge and support of their peers and mentors, which enhances their ability to achieve the specified outcomes. This collaboration supports a deeper understanding and retention of knowledge, as learners are exposed to varying perspectives and practical applications of theoretical concepts (Townley, 2020). The prevalence of CoPs in OBE also supports continuous learning and professional growth, as members of the community often remain involved beyond their formal education, continually refining and

expanding their skills (Wenger et al., 2002). This ongoing engagement ensures that learning outcomes are not only achieved but sustained and built upon, promoting lifelong learning.

Ultimately, while outcomes-based education models aim to be learner-focused and the above-stated benefits are possible in its ideal state, some versions end up having difficulty following through with intended benefits in practice. One such model that has had varying success with ensuring learner-centeredness in its approach to education is competency-based medical education. Medical education and its relationship with adult education is discussed next.

Adult Learning Theory in the Context of Medical Education

In medical education, learning takes place in traditional higher education venues and clinical environments with individuals who are adults. As Hill and colleagues (2023) note, “the study of adult learners enrolled in higher education programs sits at the boundary between adult education and higher education” (p. 62). They explain that both disciplines have distinct characteristics, with higher education focusing on the systems and administrative structure within which education programs operate, and adult education being concerned with the learning experiences of individuals. Although the higher education structure plays a supporting role in this research, it is the lens of adult education theory which informs this research.

In medical education literature, the importance of incorporating adult education theory and practices in the design and delivery of faculty development has begun to emerge (Mukhalalati & Taylor, 2019; Whitehurst, 2019). This has the benefit of integrating sound continuing professional development practices into the medical education realm. The irony of this, however, is that much of the current focus in faculty development is on educating physician teachers on the various facets of competence by design such as key definitions and tenets of competency-based education, specialty-specific outcomes, and coaching as a method of

providing feedback. Little is published on how the competence by design framework incorporates adult education theory for the learners in the programs. This is concerning because, as a new approach to medical education training is introduced across Canada, the theory which should provide a sound footing to ensure learner centricity is missing. In principle, CBME is based on the merits of self-directed learning and touts a framework which supports the needs of learners. In implementation, however, learners are left to navigate the framework and outcomes criteria to the point of self-doubt, not direction. Adult learning theory could be the answer to ensuring learner centeredness in a structured and rigid curriculum like CBME. As Alharbi (2024) notes, the holistic needs of learners in medical education programs must also be recognized especially in CBME programs where there is a magnified focus on measurable outcomes. Although some research exists on the topic of integrating adult education theory into the practice of educating medical residents (Bernstein et al., 2014; Mukhalalati & Taylor, 2019; Pinney et al., 2007; Whitehurst et al., 2019) there is still room for much more to be said about this in the literature and in the application of medical education.

Mukahalati and Taylor (2019) undertook a literature review of adult learning theories present in scholarly healthcare professional education works in 2015 and 2016. They included 110 articles in their review which pertained to various health education programs including Undergraduate and Postgraduate medical education, nursing, pharmacy, dentistry, physiotherapy, occupational therapy, and continuing professional education. They synthesized the results and found the following learning theories were employed: a) Instrumental learning theories (including behavioural, cognitivism, and experiential learning theories); b) Humanistic or facilitative learning theories (including self-directed learning); c) Transformative learning theories (including critical reflection); d) Social theories of learning (including zone of proximal

development, situated cognition, and communities of practice); e) Motivational models (including self-determination theory, expectancy valence theory, and chain of response model); f) Reflective models (including reflection-on-action, and reflection-in-action); g) Constructivism (including cognitive constructivism, and socio-cultural constructivism) (pp. 4-6).

Of these learning theories that were present in the literature, the majority focused on curricular design, teaching strategies, and effective feedback practices for faculty. However, behavioural theory is noted as being instrumental in the development of competence frameworks, and reflective practice is noted as improving learner competence and clinical skills.

The importance of reflective practice for learners and faculty in medical education is further highlighted by Noble et al. (2019). They explain that medical education can be seen as a form of workplace learning which takes place as “two co-occurring activity systems: delivering patient care and enhancing trainee learning” (p. 2). Within this clinical learning context, residents and faculty navigate the social and cultural influences of their environment and benefit from reflecting on their experiences. This experiential reflection allows them to understand their role in the healthcare team and how their actions affect patient outcomes. Through this understanding medical skills are honed, and enhanced patient outcomes can be achieved. This deeper understanding and trust in healthcare teams also contributes to the ability of health professionals to navigate uncertainty and complex situations (Coady, 2021). However, learners need to be supported and mentored by faculty in order for these circumstances to be realized (Noble et al., 2018; Noble et al., 2019).

How faculty engage in faculty development and mentor learners is not only important from a patient care perspective but also from a lifelong learning standpoint. Whitehurst et al. (2019) note that continuing medical education (CME) is vital because it is an extension of

graduate medical education. By engaging in CME, faculty can model lifelong learning attributes for their learners which supports the ongoing lifelong learning continuum in medical education. This is critical because ongoing clinical competence requires physicians to maintain and enhance their medical skills over time. However, the “skills, knowledge, and attitudes that are foundational to lifelong learning, such as self-awareness, a continual motivation to learn, and the effective incorporation of feedback into practice, are not innate” (Whitehurst et al., 2019, p. 270). Because they are not inherent, lifelong learning’s key features must be incorporated across the medical education continuum using teaching and feedback strategies and encouraging self-learning skills. Learners gain an understanding of these skills from the faculty they work with, which they bring with them into practice, continuing the lifelong learning cycle.

Further embracing lifelong learning in medical education, Pinney et al. (2007) described how incorporating principles of adult education could enhance learners’ educational experiences in Orthopedic Surgery programs. Borrowed from a curriculum for Orthopedic Surgery faculty, which they explain was the only continuing medical education offering of its kind at the time, Pinney and colleagues note eight core principles of adult education which are beneficial in residency training. The first four principles are concerned with program planning: 1. What is learned is more important than what is taught; 2. Program planning is critical to effective teaching and learning; 3. Residents learn from a hidden curriculum; and 4. Learning is driven by the resident’s perception of how he or she will be evaluated. The second group of four principles describe learning activities: 5. Foster active, rather than passive learning; 6. Teaching should engage residents at a level appropriate to their knowledge and ability; 7. Avoid cognitive overload of residents; and 8. A threatened self-concept diminishes learning (p. 1386). While these are not foundational adult education tenants, these learner-centric ideas do align with

others' ideas of what learner-centered education should look like. For example, Hoidn and Reusser (2020) put forth minimum standards of learner-centered education including active learning concepts such as engaging teaching practices which include dialogue rather than basic transmission of information, fostering a mutual respect between teachers and learners, and teaching which meets learners at their current level of knowledge. And Bremner (2020) includes active participation, relevant skills, adapting to needs, power sharing, autonomy, and formative assessment as six aspects of student centered/learner-centered education (p. 181). Finally, Knox (2016) asserts that teachers in professional programs should encourage active learning by considering situational influences, encouraging reflection, and providing feedback that helps to guide learners' decisions. In this way, active learning can support the diverse experiences and aspirations of learners.

This learner-centered focus is further emphasized by Vermette and Doolittle (2022) who note that the holistic needs of learners in medical education programs must also be recognized. They explain that, with so much focus on competency-based medical education and measurable outcomes, attention must also be paid to individuals' identity formation as they learn to be physicians. By moving the discourse from one of doing to one of being, the individual and social transformation a learner encounters as they move through residency is better recognized and understood, leading to an appreciation of the complex roles physicians take on in the workplace. Also emphasizing the need to recognize learners' holistic needs, Storrar and colleagues (2019) explain that for learners to fully engage in a competency-based medical education program, they need to have in-depth information about the framework details which apply to their learning and to feel like they are a welcomed member of the clinical team. Since the beginning of the COVID-19 pandemic in 2020, Babenko and Lee (2022) note that clinical workplaces have had to adapt to

changing healthcare needs. As such, the physicians who work and learn in these environments are experiencing not only clinical changes but also social changes and isolation due to ongoing pandemic protocols. Babenko and Lee explain that the psychological needs of physicians which promote well-being must be considered alongside educational demands ensuring clinical competence. In their study, they found that when medical students felt a sense of relatedness to others in the healthcare team their clinical decision-making skills were enhanced. In order to encourage this sense of belonging and relatedness, the authors suggest using empathic listening to promote trust and collaboration, engaging in shared decision-making and encouraging learners to ask questions, making learners feel valued through delegating important tasks to them, involving learners in team-related decisions and planning, expressing support irrespective of the outcome (success or failure), and demonstrating common humanity and empathy by acknowledging our own limitations and mistakes (p. 2). By sharing power with learners and using these active learning strategies, adult education can be used to enhance medical education learners' participation in healthcare teams and clinical outcomes.

Critiques and Concerns of Competency-Based and Outcomes-Based Education

As Gonczi (2013) noted of traditional medical education curriculum, "health education is not adequate for the challenges emerging from globalization and the changes to the health context of the current era" (p. 1295) such as changing patient and population needs, changing technology, health security risks, and a deepening divide between health education and primary care needs. CBME was promoted by medical educators, such as Frank and Holmboe (2014), who claimed it was, potentially contradictory so, both learner-centered and outcomes-based, with learners advancing to the next level of training by reaching various competency milestones. CBME was seen as an improvement over more traditional models by researchers such as Harris

(2014) and ten Cate and Billett (2014) due to its outcomes-based rather than time-based focus and promise of learner centrality. The Royal College (2014) claimed that the shift was necessary to adapt to the evolving nature of learners' and patients' educational needs in the complex health care system and to ensure high quality care. According to Frank and Danoff (2007), CBME also addressed a need for "greater accountability in all aspects of the [medical] professions" (p. 642) to promote public transparency. Although the literature in support of CBME anticipated positive learner outcomes, Boyd et al. (2018) explain that this early support was not based in empirical evidence and that it used rhetoric to attribute implementation failings to institutional shortcomings and not to the curriculum framework itself.

Despite the many early claims of educational excellence, we are still learning how the CBME approach functions when medical residents in Canada learn to be physicians. Early supporters (Albanese et al., 2008; Parent et al., 2013; ten Cate & Billet, 2014) expressed concern about the implementation of CBME, noting that these approaches have caused dissatisfaction, because clinician faculty have difficulty understanding the rules and terms used within such frameworks. Specifically, clarifying competencies and distinguishing the terms competency, roles, and performance would be key in ensuring faculty understanding. In programs that previously attempted to introduce CBME, this confusion had led to faculty having trouble evaluating learners on competencies that were not clearly understood and may appear to be theoretical in nature. As such, the evaluation checklists and forms they were tasked to complete by regulating bodies about learners' performance became futile.

The concern regarding faculty readiness and understanding continues today (Crawford et al., 2020; Kwan et al., 2020; Ryan et al., 2022). Part of the confusion is based in a lack of a common framework for CBME. As Van Melle et al. (2019), on behalf of the International

Competency-based Medical Education Collaborators, explains, the implementation of CBME took off quickly across many different countries and in many different nuanced learning environments. Due to this broad implementation of a complex curriculum by many different parties, how CBME looks in practice differs among institutions. The International CBME Collaborators, via a Delphi study, produced a list of five core components that a CBME program should embody to be successful: outcome competencies, sequenced progression, tailored learning experiences, competency-focused instruction, and programmatic assessment (Van Melle et al., 2019, p.1006). However, in suggesting that these five core components be used for evaluating the implementation of CBME programs, Van Melle et al. (2019) recognize that these components were primarily based in design elements of the curriculum framework and that variances in learning environments could affect how these defining factors look in practice as implementation of CBME continues.

On a more granular level, an ongoing particular concern is faculty understanding of outcomes-based assessment practices (Harris et al., 2020). Moving from summative assessments with Likert scale questions to more frequent low-stakes assessments with a focus on narrative feedback and coaching has proven to be a challenging change of practice. Ongoing just-in-time and longitudinal faculty development are now the suggested best practices (Dagnone et al., 2019), with involved parties receiving resources and on-the-job training for evaluation forms and coaching conversations right before they need to use them (Crawford et al., 2020). Otherwise, CBME information received too far in advance is often not retained and is of little use to faculty. A longitudinal approach where faculty not only receive resources on completing assessments but also feedback on their assessment and coaching skills is needed for long-term success (Sirianni et al., 2020). In more recent literature, proponents of CBME, like the members of the International

Competency-based Medical Education Collaborators, are presenting a more balanced view on the implementation and validation of the CBME framework, recognizing that it is not without faults and that a broad curricular change takes time to fully introduce. It is clear in the literature that CBME is not as easily implemented as once thought and takes time for various programs to implement the curriculum components and bring faculty onboard successfully (Holmboe et al., 2017; Sherbino, 2020; Van Melle, 2019).

While the current literature remains heavily focused on institutions and faculty, and not the learners in CBME programs, learner-centric articles have begun to emerge in the literature. In a 2024 article from a team of Royal College competence by design (CBD) leads, Atkinson and colleagues explain that learners in CBD programs were not initially engaged in the change process of the new curriculum design. They note that this oversight was a “clear gap in the design” (p. 90) of the educational framework. Although Atkinson and colleagues (2024) go on to note that learners are now more involved in the planning and program enhancement process, other scholars note that there are still learner challenges in CBD programs. For example, Ott and colleagues (2022) undertook a study of Canadian medical residents and their experiences regarding the increased workload of gathering workplace-based assessments in competence by design programs. They found that learners experienced increased stress and mental load when tasked to manage their learning objectives quotas and ensure that they were meeting entrustable professional activity (EPA) requirements at various stages of training. Of particular concern were threats to learner autonomy (including “missed opportunities to self-regulate,” “lack of situational control” and “comparative assessment” (p. 585)), threats to relatedness (including “lack of trust,” “lack of control,” and “lack of connection” (p. 586)), and threats to competence (including “lack of clarity,” “unrealistic expectations,” and “[feedback on] forms vs feedback

[in-person]” (p. 587)). The authors emphasized that experiencing a threat in one area easily compounds into stress in another area, creating a domino effect of negative experiences.

This sentiment of learner burden and stress was shared by Branfield Day and colleagues (2023) and Miller and colleagues (2024) who also undertook a study with Canadian medical residents to learn about their experiences in CBD programs. They found that the learners they interviewed experienced stress and anxiety with the assessment design and burden of assessment tracking and completion, aligning with those learners in the Ott and colleagues (2022) study. In both studies, a misalignment between in-person feedback interactions with faculty and the feedback they received on EPA forms was noted. Learners also shared that inconsistency of faculty use of entrustment scales on EPA forms made it difficult to know what was expected of them. Furthermore, the Miller and colleagues study elucidated a lack of transparency regarding CBD, CBD not being what they expected, and the overall psychological burden that being part of a CBD program causes learners.

In a 2024 study, Braund and colleagues compared the experiences of residents in non-CBD programs to those in a CBD program. They found that both groups were apprehensive about the added administrative burden of assessments in CBD and were cognizant of the added stress this can cause learners. However, the study found that, despite the added cognitive stress of tracking their EPAs, the CBD learners were more proactive in their learning and had exhibited enhanced self-reflection. While these studies begin to explain what it looks like for learners in CBD programs, there is still much room to learn more about these experiences and a gap to fill in terms of relating these experiences to adult education theory.

Chapter Summary

This chapter reviewed relevant literature to give context to the current medical and professional education landscape in Canada within the context of competency- and outcomes-based education. The challenges associated with the implementation of competency-based medical education were explored and a gap in the current literature was identified. The further exploration of learners' experiences in the discussion of competency-based medical education is an underexplored area I aimed to contribute to with this research study. Detailed insights of how the study was designed to obtain this new information is explored in the following methodology chapter.

Chapter 3: Methodology

In education research, Varpio and MacLeod (2020) note that methodology sets forth guidelines and principles which generate knowledge aligning with the study's epistemology and ontology. To articulate the methodology of a research paradigm, researchers should seek to answer the following questions: "How should the researcher go about finding out knowledge? What is the nature of the research approach that will enable the scholar to develop new knowledge?" (Varpio & MacLeod, 2020, p. 688).

In keeping with an interpretivist research paradigm, my methodology employed a qualitative instrumental case study to garner the knowledge required to answer my research questions and fulfill my objectives. To develop new knowledge my research approach included conducting a focus group and semi-structured interviews with six learners in Anatomical Pathology and General Pathology, two diagnostic-focused residency training programs in the same clinical department at a Canadian university, that switched to a competence by design (CBD) curriculum in July 2019. Ahead of the participant research, I undertook a document analysis, reviewing relevant existing artifacts, including blank evaluation forms, program resources, and faculty and resident learning modules and supporting CBD documents from the Royal College. The document analysis phase of research took place between January to March 2023, with the participant research taking place between March, April, and May 2023. An in-depth account of the components of my study's methodology follows below, preceded with an introduction to my researcher positionality.

Researcher Positionality and Rationale

A researcher's positionality refers to the acknowledgment of their own background, perspectives, and social position which are inherently contextual (Soedirgo & Glas, 2020), and

how these factors influence the research process. As Soedirgo and Glas explain, positionality is shaped by a combination of personal, social, and political factors, and it requires researchers to reflect on how their identity, experiences, and power dynamics may affect their interactions with research participants, their data interpretation, and the overall research design.

Personal Identity

Personal identity includes the researcher's race, gender, ethnicity, sexual orientation, age, and other aspects of identity that may shape their worldview and influence their research practices (Holmes, 2020). In my case, I identify as a middle-aged, Caucasian, straight, cis-gendered female. Interestingly, I have fifth generation Mi'kmaq lineage from the St. George's Newfoundland Indian Band (now part of the overarching Qalipu Mi'kmaq First Nation). However, living as an Indigenous person is not my lived experience so I primarily identify with being Caucasian in my daily life. I have experienced the privilege of being a white person of primarily European settler descent while reconciling thoughts of my Indigenous ancestors and the hardships they endured. This dynamic is a personal reminder that everyone has a unique life story that contributes to their way of seeing and experiencing the world.

Social and Cultural Background

A researcher's cultural heritage, educational background, socioeconomic status, and lived experiences play a crucial role in shaping how they approach research (Chavez, 2008). This includes how they perceive and interpret social phenomena, which influences their interactions with the subject matter and participants. As someone who grew up in a primarily Caucasian, upper-middle-class, single-parent home with Christian and North American cultural influences, this inherently shapes my positionality as a researcher. My father served in the Royal Canadian Air Force for 27 years and then went on to have a successful career as an entrepreneur in real

estate. Since he was a single parent, I had a front row seat at his tenacity and work ethic which invariably shaped my views on professionalism and career goals. These early experiences provided me with a certain level of privilege, including access to quality education and resources. Now, as a wife and mother of a child, with an upper-middle-class socioeconomic status, I continue to experience the benefits of this background. My academic journey, which includes a Master of Education degree and nearing completion of a PhD in Educational Studies, has further expanded my perspective. As a medical education researcher, I find that holding advanced degrees often affords me respect from the highly educated participants with whom I engage. This combination of personal, social, and educational influences informs how I approach research, particularly in terms of understanding both the advantages and limitations that my positionality brings to engaging with diverse populations and contexts. I recognize the importance of being critically aware of these factors, as they inevitably shape my interactions, interpretations, and conclusions in the research process.

Researcher-Participant Relationship

Positionality also involves understanding how the researcher's relationship with the participants (whether as an insider or outsider) affects data collection and interpretation. Insider researchers may share similar experiences or identities with their participants, while outsider researchers may come from different backgrounds, which can influence rapport and the trust-building process. As I undertook my doctoral research in the Department of Pathology at the same Canadian medical school I worked at, I was considered an external insider (Fletcher, 2019) since I am socialized external to the medical education environment but have accepted the culture of the community I was studying. As such, I believe that I was considered an adopted insider by my study's participants as rapport and shared meanings were established with minimal

difficulty. Although I worked in a different diagnostic-focused specialty department at the same institution at the time the research took place, I had no interaction with the learners and staff in the Department of Pathology prior to my study. Throughout the study, I corresponded with participants via my student StFX email address at and not my professional email address.

To address potential bias in my research as an external insider, I employed strategies such as triangulation and reflexivity to ensure that my positionality did not unduly influence the research process. Triangulation to reduce bias was implemented by incorporating multiple data sources and perspectives to validate my findings. By gathering data through a focus group, individual interviews, and document analysis, I ensured that my conclusions were not overly reliant on one type of evidence. Also, engaging in member-checking with participants helped confirm that my interpretations accurately reflected their experiences and perspectives, thereby enhancing the credibility of my research (Creswell & Poth, 2016). These strategies ensured that I remained aware of my positionality and its potential impact, while also safeguarding the integrity of the research process. Reflexivity, which involves critically reflecting on my own role and potential biases throughout the research, was an essential tool for maintaining objectivity. By regularly documenting my thoughts, assumptions, and interactions with participants in my researcher journal, I remained conscious of how my position as an external insider could shape my interpretations and relationships with participants (Berger, 2015). This ongoing reflexive practice allowed me to continuously assess how my dual roles as a researcher and staff member at the institution might have influenced data collection and analysis. Reflexivity is explored more in the next section.

Reflexivity

An essential part of positionality is reflexivity, or the ongoing critical reflection on how the researcher's positionality shapes the research process. Researchers engage in reflexivity to ensure transparency and to account for potential biases in their work (Berger, 2015). As a researcher who works in medical education, I was inextricably linked to the research study and inevitably influenced how it was conducted, its outcomes, and results (Rowe, 2014). Being aware of this influence and using reflexivity throughout my study enhanced transparency while mitigating bias and allowed me to explain the "subjective contextual aspects" (Holmes, 2020, p. 2) unique to me that impact my evolving research praxis. Acknowledging that my positionality and worldview will continue to shift as I experience life, I further explore how my current ideologies in relation to the research subject, participants, and research context and process (Savin-Baden & Howell-Major, 2013) informed my dissertation work next.

Professional Experience

I have spent the majority of my professional career as an administrator at a Canadian medical school, 11 years of which I was as an Education Manager with a Department of Diagnostic Radiology. From organizing faculty lectures for medical students to ensuring our residency training programs met accreditation standards, I had administrative oversight of my department's academic activities. I am also an education researcher, engaging in local and national conferences on various topics focusing on adult education through the lens of professional education.

Exploring the learner experience in CBME programs is an important area of study to me since, as an administrative educator with a Canadian medical school for the past 18 years, I have witnessed how the Royal College enforces assorted elements of curriculum and evaluation

design upon residency training programs without taking the variances of individual learners, programs, departments, and universities into consideration. With formal follow-through from the Royal College only occurring during accreditation reviews every 8 years (Laliberte & McGurn, 2017), often the promised benefit of new curriculum elements for learners is touted by the Royal College with varying levels of success at the program level.

Academic Experience

The idea of exploring learners' educational experiences in a CBME program is also important to me from an adult education perspective because I completed a Master of Education degree in Lifelong Learning in 2014 which gave me a deeper understanding of adult education theory. While attending RCPSC conferences for professional development, I often found myself frustrated when the speakers tended to market CBME to the medical education community, with promises of a learner-centric approach that will have cost-savings benefits for programs, universities, and hospitals, without mention of how learners in the programs will actually be affected. In the Royal College's "Competence by Design (CBD): What you need to know – A Resident's Guide" (2017), learner-centered benefits of CBD are promised including:

more frequent assessment and meaningful feedback from faculty, well-defined learning paths and clarity around the competencies needed to progress to next stages of training, a learning plan that focuses on personal development, the chance to prepare for independent practice by honing skills and working more independently during the final stage of residency. (p.1)

However, as noted in the literature and reflected in my professional experience, mandated changes, such as a new curriculum framework, are implemented with unreliable levels of success due to several factors including lack of faculty development, lack of faculty or learner

engagement, and lack of administrator resources, training or understanding (Carraccio et al., 2013; Dagnone et al., 2019; & Hawkins et al., 2015). My research will contribute to understanding whether these promised learner benefits are actually added gains in a competency-based program or not.

Philosophical Position

In my academic, work, and personal life, I value learning and living in a structured way that allows for deconstructed elements. My viewpoint is one that recognizes each person brings different perspectives to different contexts which are constantly in flux due to intrinsic and external factors. Much like health education programs, I believe life operates within a material world which requires some structure and rules to benefit the greater good.

This view is one that I bring to my research work. I believe this is because I can appreciate that many dimensions and truths help tell a story but tend to operate within the social structures of human life. I am a pragmatist at heart, valuing well-constructed educational initiatives while realizing that learners' and teachers' needs are in flux. That being said, I do resonate with aspects of realism, reconstructionism, existentialism, and analytic philosophy (Ozmon, 2012) and think it is important to be aware of this as I approach various educational situations. For example, because I like structure and planning in educational initiatives, I do not always feel comfortable with last-minute changes or the rushed introduction of a new learning tool or assessment. Knowing that this apprehension comes from my personal philosophical beliefs on how educational frameworks should be designed and implemented allows me to critically appraise a situation and move forward. It was important for me to keep an open mind when interviewing learners and analysing and reflecting on their individual experiences.

Philosophical Assumptions About Knowledge

In the study of philosophy, epistemology, axiology, and ontology are foundational branches that provide lenses for understanding knowledge, values, and the nature of reality. This foundation is central to a researcher's worldview or *paradigm*. Epistemology deals with the nature, sources, and limits of knowledge, questioning how we come to know what we know and the validity of our methods for acquiring knowledge (Biesta, 2020). Axiology, on the other hand, concerns itself with the study of values, particularly in relation to ethics and aesthetics, and addresses the role of education in shaping moral and cultural values (Antoniuk et al., 2021). Lastly, ontology explores the nature of being and existence, examining what kinds of entities exist in the world and how they are interconnected (Patomaki, 2020). Together, these three philosophical areas offer a framework for exploring how knowledge is formed, how values guide human actions, and how reality is conceptualized in both educational and broader social contexts. In the following section, I explore how my philosophical assumptions about knowledge impact my approach to education research.

Epistemological Viewpoint

In resonating with realists, I hold the belief that we acquire knowledge and learn about our reality in the material world through our senses. Realism, rooted in empiricism, posits that sensory experience is foundational to knowledge acquisition. As van der Linden and McKenney (2020) highlight, epistemology is evolving to include a broader understanding of how we engage with knowledge in practical settings, with growing attention to the integration of experience and reflection in learning processes. I relate to the notion that realists "... put great emphasis on the practical side of education, and their concept of 'practical' also includes education for moral and character development" (Ozmon, p. 58).

To me, education occurs in both formal and informal ways, providing learners with tools to succeed while shaping their moral development, aligning with contemporary approaches to epistemology that emphasize relational and situated knowledge (Biesta, 2020). Within a medical education residency program, a curriculum is pieced together that encourages learners to obtain practical medical knowledge and also to engage in reflection and ethical reasoning in clinical practice. Residents acquire these skills through didactic lectures, interactive rounds, self-study, and mentorship with faculty physicians, fostering both cognitive and moral development. This mix of practical and character-building curriculum permeates the lens through which I undertook my data analysis.

Ontological Viewpoint

In terms of what actually exists and how it exists, I agree with the existentialist perspective that individual thought and context are paramount when understanding what is real, and that individual truths are important. Ontology, which concerns itself with the nature of being and existence, aligns with the existentialist view that reality is subjective and deeply tied to personal experiences and contexts (Crowell, 2012). Ozmon (2012) explains that existentialists are concerned with how the questions of the nature of knowledge, truth, and meaning - central to other philosophies - are significant within the lived experience of individuals (p. 218). This resonates with me because I believe that it is impossible to paint all individuals with the same brush; educational frameworks should take the differences of individuals into consideration. Contemporary discussions of ontology also emphasize this multiplicity of realities, particularly in educational settings where diverse cultural, religious, and personal backgrounds shape each learner's experience (Xu, 2022). For example, the group of participants in this research study are from various parts of Canada and the world, with different cultural and religious backgrounds

and beliefs. These varied backgrounds influence their perceptions of the world and their learning styles. In a broader context, one can imagine how many differing viewpoints and realities interact within a healthcare or university setting.

Axiological Viewpoint

I agree with the reconstructionist belief that education can and should be used to enact social action and assist oppressed groups in finding their freedom, whatever that may mean for them. Axiology, which is concerned with the nature of values and ethics, plays a critical role in this perspective, as it underscores the importance of fostering social justice through education (Audebrand & Pepin, 2022). Reconstructionist philosophy aligns closely with the idea that education should not only impart knowledge but also encourage individuals to advocate for social change and improve the conditions of their society (Noddings, 2018). This resonates deeply with me, as I believe that education is a powerful force for positive transformation, empowering people to challenge injustices and make informed efforts to create a more equitable world. Without education, individuals are denied the opportunity to critically reflect on their circumstances and thus cannot be fully equipped to strive for meaningful change.

I also connect with the idea that “reconstructionists tend to look at problems holistically” (Ozmon, p. 157). This holistic approach, considering both the larger societal structures and the individual experiences within them, allows for a more comprehensive understanding of issues and potential solutions (Freire, 2020). By adopting a big-picture perspective, my aim is to be better equipped to address challenges in educational programming, anticipate obstacles and develop strategies that not only resolve immediate concerns but contribute to long-term improvement. It is with this in mind that that I endeavour to find the intersection of where adult education meets competency-based education for the betterment of learners.

Philosophical Motivation

In reflecting on my personal paradigm, I can critically assert that I find it most rewarding and fulfilling in my professional and personal life when I feel like what I am doing will help someone else. This motivation, coupled with an interest and experience in adult and medical education, led me to my dissertation research of wanting to explore the learner experience in an outcomes-based curriculum in order to gain insight on what was happening from an andragogical perspective. My intrinsic belief was that, by taking a holistic and analytic approach to this research within the context of adult and competency-based education, I could have a beneficial impact on learners' experiences and curriculum development in the future.

Interpretivism as a Research Paradigm

Interpretivism, as the guiding research paradigm for this study, focuses on the subjective meanings that individuals, in this case, medical residents in a competency-based medical education (CBME) program, assign to their experiences. Central to interpretivism is the understanding that knowledge is constructed through social experiences, and thus, as the researcher, I sought to understand how participants interpret their realities based on their specific social and educational contexts (Schwandt, 2014). As seen in this study, residents in a CBME program are continually assessed on programmatic outcomes. How they make sense of these assessments, feedback, and overall progress is influenced by their personal experiences and interactions with mentors, peers, and the program's curriculum structure. Using an interpretivist lens allowed me as the researcher to delve into the nuances of how learners perceive and respond to competency-based evaluations, how they navigate the challenges of self-directed learning, and how they view their evolving roles as medical professionals. The study's data collection methods, explored more later in this chapter, were designed to capture the rich, contextualized

experiences of participants, focusing on their interpretations of the feedback they receive, the outcomes they are required to meet, and their understanding of competency within the broader context of their medical training (Merriam & Tisdell, 2016).

By acknowledging that reality is co-constructed by the participants and the researcher, interpretivism does not aim to generate generalizable findings, but rather to provide deep insights into how learners interpret their educational experiences. This paradigm is particularly relevant in CBME, where the focus is on individualized learning trajectories and the personal meaning residents derive from their assessments and feedback (Martin et al., 2023). Interpretivism, therefore, offers a beneficial paradigm for understanding how medical residents construct meaning within a complex, competency-driven educational environment.

Adult Education as a Theoretical Framework

In this dissertation, adult education and lifelong learning theory serve as the primary theoretical framework to explore how medical residents engage in their learning journey within a competency-based medical education (CBME) program. Adult education, particularly through the lens of andragogy, emphasizes that adult learners bring prior experiences, intrinsic motivation, and a degree of self-directedness to their learning (Knowles et al., 2015). For medical residents, who are navigating the complexities of professional practice and continuous assessment, this framework highlights the importance of the ongoing learning processes where practical application in clinical settings plays a significant role. Lifelong learning extends this concept, recognizing that learning occurs not only in formal instructional settings but also in professional practice, mentorship and peer relationships, and through reflective self-study (Merriam & Baumgartner, 2020). By examining how residents engage with learning opportunities both inside and outside formal clinical experiences, this research illuminates how

lifelong learning contributes to their development of required clinical competencies and their adaptation to the demands of professional practice. Moreover, this framework acknowledges that lifelong learning is critical to a residents' professional growth and effectiveness as a physician (Biesta, 2020). Through this lens, this study offers a view of how adult education and lifelong learning theory informs medical residents' experiences in a CBME program and insight into their professional identity formation within CBME.

Case Study Design

Case studies are used in qualitative research design when a “holistic, in-depth investigation is needed” (Tellis, 1997, p. 2). By using multiple data sources, case studies are designed to bring forth details of an experience from the perspective of a participant. Merriam and Tisdell (2016), Stake (1995) and Yin (2017) provide in-depth insight on case study design and ensuring data triangulation. As Cleland and colleagues (2021) note, Stake's approach to case study research is based on his epistemic view of constructivism and interpretivism. Aligning with my interpretivist research paradigm, I utilized Stake (1995)'s approach to case study design.

Specifically, an instrumental case study helped me to gain a “general understanding and feel that we may get insight into the [research] question by studying a particular case” (Stake, 1995, p. 3). By studying the learner experience in Pathology's competence by design programs, it will help to inform the learner experience in CBD programs in Canada. As Stake goes on to note, an instrumental case study also helps to provide insight on an issue (the learner experience in a CBD program) while the case itself (the Pathology department) plays a supporting role. When using an instrumental case study design, it can be helpful to examine an atypical case in order to illuminate details we may miss in typical cases. In examining a lesser-studied diagnostic-focused CBD program, my intention was to provide a new understanding of the

learner experience while uncovering details yet to be studied in the more commonly examined procedural-based and surgical specialties.

Case Study Elements

As Simons (2009) explains, “case study is an in-depth exploration from multiple perspectives of the complexity and uniqueness of a particular project, policy, institution or system in a ‘real life’ context” (p. 21). It is this multi-dimensional exploration and interpretation of contextual understanding which Cleland and colleagues (2021) believe medical education research is primed for. The basic elements of my instrumental case study design can be found below, using the elements outlined Cleland and colleagues’ (2021) table titled “Table 2 The basic elements of case study research” (p. 1134).

The Case. The first element is the case, described as “an entity of interest or unit of analysis” (Cleland et al., 2021, p. 1134). In my study, the entity of interest was learners in competency-based professional programs. Specifically, six learners who were enrolled in a diagnostic-focused competence by design residency training program at the time of the study.

A Bounded System. The next element is a bounded system in which “the case is specifically bounded by time, space and activity” (Cleland et al., 2021, p. 1134). The bounded system in my case study was the Pathology department in a tertiary teaching hospital in one city and their postgraduate medical education programs for the duration of their program. The duration of the CBD program at the time of this study was almost four years, as the programs transitioned to an outcomes-based program in July 2019 and this research took place in March to May 2023.

Studied in Context. Next, the case is studied in context or in its “real-life setting or natural environment. Contextual variables may include political, economic, social, cultural,

historical and/or organisational factors” (Cleland et al., 2021, p. 1134). Taking this into consideration, my context was the Anatomical Pathology and General Pathology diagnostic-focused residency training programs in the academic and clinical Department of Pathology at a Canadian university and the hospital within which it resides. These are academic programs accredited by the Royal College of Physicians and Surgeons of Canada.

In-Depth Study. The fourth element of my case study design is in-depth study which “affords intensive analysis of an issue that yields to fieldwork and that may vary in depth and engagement depending on the philosophical orientation of the research, purpose and methods” (Cleland et al., 2021, p. 1134). To afford this intensive analysis, I undertook fieldwork that included a focus group with all participants, individual semi-structured interviews with each participant, and a retrospective review of document and artifact analysis, including faculty and resident development materials and learner resources and assessment forms. The research took place over 3 months, and, as the researcher, I embraced an insider-outsider role while taking reflective field notes.

Selecting the Case. Next, the fifth element is concerned with selecting the case and ensuring that it “reflect[s] the purpose and conditions of the study... This may involve single, within case and between or multiple case sampling in order to capture ordinary, unique, varied, etc.” (Cleland et al., 2021, p. 1134). The purpose of my study was to gain insight on the learner experience in competency-based programs, specifically CBD programs through a learner-centered education and adult education lens. A unique case was used to capture details not yet studied.

Multiple Sources of Evidence. Lastly, Cleland et al. (2021) point to the importance of the case utilizing many different forms of data collection to provide a “comprehensive in depth

and breadth of inquiry. This can include multiple methods, data and/or analyses. Triangulation is a highly valued and often used logic of combining sources of evidence” (p. 1134). To achieve this breadth of inquiry and triangulation, I undertook fieldwork which included a focus group, semi-structured interviews with residents in various stages of their program completion, a document analysis of evaluation forms, faculty development materials, CBD policies and procedures, and writing reflective field notes via journaling throughout my study. Participant member checks were utilized to ensure the accuracy of the context of direct quotes.

Case Study Critique

An ongoing critique of qualitative case studies is that they can be too subjective and lack generalizability (Stake, 2010). Being aware of this potential disadvantage as a researcher gives way to mitigating this in the data analysis by providing sufficient context and rich description to allow for transferability. However, it is in this rich description where another prominent critique of this methodology originates. Simons (2009) demonstrates that, in aiming to provide rich detail for transferability, researchers can potentially face a challenge in portraying important details that could identify participants. Cleland and colleagues (2021) note that this unrealized ethical complexity is especially prominent in health education research where “those engaged in CSR may find themselves privy to issues of patient safety, learner mis-treatment, problematic research practices and other such things” (p. 1138). As such, especially in my research context, I endeavored to maintain participant and program confidentiality regardless of what “other such things” I may have inadvertently uncovered. This maintenance of confidentiality is reflected in the use of pseudonyms for participant names, a general review of participant ethnicity and ages, and not expressly noting which university, hospital, and city the research took place in.

Ultimately, as Miles (2015) explains, case study methodology by way of design embraces the complexity of an account of experience. Although a case study methodology represents only a snapshot of experience in a context-specific setting, it is the researcher's responsibility to articulate an account of the case that can be of use to the broader academic field.

Participant Selection Criteria, Recruitment, and Consent

A purposeful, homogenous sampling method (Suri, 2011) was used to determine participant selection. In the 2022-2023 academic year in which my research took place, there were six residents in their first year, four in their second year, four in their third year, and two in their fourth year of the Pathology CBD programs. This provided a pool of 16 potential participants. I had hoped to recruit learners from various academic training years and was successful in that endeavor, with three learners in their first year, two in their third year, and one in their fourth year of training consenting to participate, for six participants total. The criterion for selection was that a participant was an enrolled resident of the Anatomical Pathology or General Pathology programs at one specific Canadian university, and all residents in the programs were invited. I believe that my participants represent the gender and ethnic mix of the residency group.

Who are Pathology Residents?: Demographic Profiles

The demographic profiles of the learners that match to residency training programs in Pathology are partially unclear, as there are no updated specialty-specific demographics available. However, in terms of gender, in a 2019 report from the Canadian Medical Association, it was noted that there were 292 practicing pathologists in Canada. Of the 292, 62% were male and 38% were female. The report noted a slow trend of increasing numbers of females in the field. Similarly, in America, Tanvir and colleagues (2023) note that female pathology residents

and pathologists increased by a ratio of 5.18% between 2007-2018. Yet, there is disparity in full professorships and research funding when it comes to their male counterparts. This mirrors the national trend of a gradual increase in the participation of women in medicine over time, yet a lack of advancement to the upper echelons of academic positions remains.

Beyond these two reports, Pathology resident-specific data was not available. There are, however, typical demographics for resident learners in Canada that were reflected in my participant group. For example, residency programs in Canada attract medical graduates who have just completed their MD degrees. Therefore, residents are usually in their mid-20s to early 30s when they enter their respective programs. This age range allows for a mix of recent medical school graduates and individuals who may have gained some other clinical or educational experiences before pursuing pathology training. In this study, participants who were current Pathology residents were between 26-36 years old.

Similarly, Canada is known for its multicultural society, and this diversity is often reflected among medical residents. Residents may come from a variety of cultural and ethnic backgrounds, contributing to the multicultural fabric of the Canadian healthcare system. In this study, four of the six participants identified as belonging to a cultural group that would be considered a visible minority in Canada, with two participants identifying as Caucasian.

Although learners entering residency are required to hold an MD degree, some residents may have pursued additional degrees, such as PhDs or other research-oriented qualifications, before entering residency. And some residents may have worked in a similar health-related field before undertaking their MD studies. For example, in this study, two participants entered medical school after working in Pathology-related laboratory roles.

In terms of geographic distribution, Pathology residents can be found across Canada, but the distribution varies based on the locations of available residency programs at medical schools. These programs may attract residents from within their respective provinces or from other regions of the country. Some programs also accept learners who graduated from international medical schools. In this study, two participants came to the Pathology department after graduating from an international medical school and four participants had completed their MDs at Canadian medical schools.

Participant Recruitment and Consent

All current residents of the Anatomical Pathology and General Pathology programs at a Canadian university were invited to participate in the research study via email from the programs' administrative assistant on January 10, 2023. After the initial email, five participants agreed to participate in the research study. A reminder email was sent to the learner groups on January 20 and 27, 2023, with the latter communication garnering one additional response. As I received participant emails, I responded with a thank you email and sent each participant an "Invitation to Participate: Focus Group" form so they could review the information and contact me with any questions prior to the focus group session. Once the date and time for the focus group was confirmed, I sent an email to all participants with a "Consent Form: Focus Group" and another copy of the "Invitation to Participate: Focus Group" attached. In the email, I explained to participants that the documents were for their review and to reach out if they had any questions. I also noted that I would have two copies of the consent form on-hand for them to sign upon arrival at the focus group session (one for their records and one for my records).

Two days after the focus group took place, I emailed each participant individually thanking them for their participation in the focus group and inviting them to set up a time for

their interview, noting that an interview could take place in-person or online via Microsoft Teams. Attached to this email, I included the “Invitation to Participate: Interview” and asked participants to review and let me know if they had any questions. The day before each interview, I emailed the scheduled participant a “Consent Form: Interview” and another copy of the “Invitation to Participate: Interview” for their review. For participants attending an interview in-person, I also noted that I would have two copies of the consent form on-hand for them to sign upon arrival. For participants attending an interview online, I asked them to sign a copy of the form and return it to me for my records.

Research Site and Access

The research site was the clinical department and academic offices where medical education programs operate at a tertiary hospital in a Canadian city. As an employee of an academic department operating out of the same hospital as the Pathology department, I was familiar with the environment in which various training programs operate and had security access to the site.

Data Collection Methods

Given that I employed a case study research design within the bounded system of one department’s residency training programs, my data collection methods involved “multiple sources of information (e.g., interviews, audio-visual material, ...and documents and reports)” (Merriam & Tisdell, 2016, p. 40) to provide a rich description of my case and explore case-based themes. These multiple sources of information allowed me to gain a well-rounded understanding of my participants’ experiences and comprised my data collection methods which are outlined below.

Document Analysis

By reviewing relevant program-specific and Royal college-generated documents during my data gathering phase, I was able to deepen my understanding of how the programs in my study implemented and use the competence by design curriculum approach. As Merriam and Grenier (2019) explain, the merit of using documents as a data source “lies with the fact that they already exist in the situation; they do not intrude upon or alter the setting in ways that the presence of the researcher might” (p. 15). In other words, documents allow the researcher an inside view to details that may not surface through in-person interactions with participants or the case site. Program documents I reviewed include curriculum maps which laid out where and how the mandatory outcomes or “entrustable professional activities” (EPAs) could be achieved organized by stage of training, quick reference cards for faculty and residents further exploring where and how EPAs could be achieved, and a sample of an “EPA Audit Report Card” which is a letter sent annually to each faculty member with a bar chart showing their form completion statistics in comparison to the department average. These resources were sent to me from the programs’ administrative assistant. I also reviewed publicly available documents from the Royal College website including the full published lists of EPAs and their subpoints or “milestones” as dubbed by the College, for both the General Pathology and Anatomical Pathology programs. I also reviewed relevant resident-focused CBD messaging and guides from the Royal College. An in-depth review of these documents is explored in the Document Analysis chapter.

Focus Group

As Wibeck et al. (2007) note, focus groups allow for the co-construction of meanings and for the articulation of shared knowledge of the collective. To take advantage of this shared knowledge, I prepared a “Focus Group Guide” (Appendix A) to facilitate a collective discussion.

In developing the guide, I employed Morgan (2019)'s "funnel shaped interview guide" (p. 69) approach, which suggests presenting one or two broad questions followed by three to five in-depth questions, and then concluding with a wrap-up question. To ensure I was ready with a sound structure for the session, I also incorporated Cyr (2019)'s suggestions of setting a welcoming tone, providing an introduction that sets the ground rules in a friendly way, and assures participants of how their confidentiality will be maintained (p. 74). Furthermore, following Cyr's recommendations on refreshments, meeting space set-up, and guiding the discussion through to wrap-up and debrief was helpful in facilitating my study's focus group session.

The focus group took place in-person on March 7, 2023 at 5:30pm. Participants were invited to arrive any time after 5:00pm to get comfortable. This time was chosen, as it is the typical end of the workday for Pathology residents and I had hoped that, by hosting the session for an hour at the end of the workday versus during a lunch hour, that participants would not be distracted by thoughts of needing to get back to work. Refreshments including pizza, vegetables and dip, cookies, and bottled water were provided as a token of appreciation. The focus group took place in a conference room in the department I worked in that was located at the same hospital site as the participants' workplace, so it was an easy commute for them to attend. There was one big oval-shaped table in the room with chairs around it. I positioned myself at the end of one of the sides, as to not sit at the head of the table but to sit where I could greet participants as they arrived and be out of the way for them to get settled.

Participants arrived with an enthusiastic attitude and were keen to share their experiences, noting that they believed the research study was important. As we worked our way through the interview guide, it became apparent that there were shared experiences amongst the group and

early themes developed. There was also a variance in experience due to the different learner levels in the group which made for a robust discussion. This discussion is explored in detail in the following data analysis chapter.

Kamberelis and Dimitriadis (2013) explain that focus groups are useful in drawing out nuances and complexities of what is being studied and “tends to promote a kind of ‘memory synergy’ among participants, and it can motivate efforts to bring forth the ‘collective memory’ of particular social groups” (p. 40). In this study’s focus group, it was the collective memory exploration and synergy that proved to be especially helpful in assisting in drawing out additional details or memories that I noted to be further explored in each of the individual interviews.

Semi-structured Interviews

Following the focus group, an interview was scheduled with each individual participant, which took place between March 12 and May 10, 2023. As Lambert and Loiselle (2008) note, when using focus groups and interviews in a study to ensure data confirmation or completeness, researchers should aim for each method to enhance knowledge in different ways. For example, a focus group may reveal broad characteristics of a scenario, whereas interviews can assist in understanding individual experiences. This was my aim in having the interviews follow the focus group. Following the focus group, I listened to the recording and reviewed the transcript, not only for thematic analysis, but also to observe individual nuances. These nuances were recorded for each participant and woven into their interviews alongside the semi-structured interview guide (Appendix B).

The semi-structured interview guide allowed me to have a common ground from which to approach each interview, while giving space to explore for individual nuances which arose

from the focus group. It also offered room for probing questions and to explore other participant ideas that arose during our conversations. The questions I had initially included on the guide were based on Merriam and Tisdell's (2016) suggestions of types of good questions (pp. 118-120). Validity evidence (Jordan et al., 2021) of my interview questions was sought via content review by my doctoral supervisor and supervisory committee. Jordan et al.'s further considerations for conducting interviews: proper environment, rapport, explain format, consent, choosing data gathering/recording strategy, active listening, and response process validation (p. 4) was used to ensure process consistency.

In terms of environment, I gave participants the option to meet in-person in my office which was located next door to the conference room where the focus group took place. Alternatively, they had the option to choose an online meeting via Microsoft Teams. In the end, two participants elected for an in-person interview and four preferred an online interview. At the beginning of each interview, I made sure to build rapport with a friendly chat on how the participant's day was going and reviewing the study's confidentiality measures. Then I moved on to the questions on the interview guide, while weaving in each participant's notable focus group points. At the end of each interview, I asked if there was anything I missed or anything else that the participant would like to share. An in-depth review of the interview data is included in the data analysis chapter.

Data Analysis Methods

During the data analysis process, it was important for me to "make decisions that narrow the study" (Merriam & Tisdell, 2016, p. 197) and not get sidetracked trying to explore the various concepts which arose unless they added to the richness of this dissertation. Interesting concepts which arose and are not linked to my dissertation research were noted and put aside as

possible future research topics. I was also cognizant that each participant brings a unique frame of reference into the study and reflected further via journaling to understand participants' subjective response narratives (Philipps & Mrowczynski, 2021) throughout the data analysis process. Journaling was also used to reflect on my positionality, ensuring that I did not limit the study by allowing my beliefs to skew the information based on my personal beliefs and professional perspective. For example, following the focus group, I noted, "The workload of CBD for residents is greater than I realized – Takes away from learning and being authentic selves (nervous to ask questions because faculty will note on evaluation form that resident didn't know answers). Was this 'fixed' in the specialty I work in by customizing entrustment scales? Table for future thought outside of dissertation research." This reflection through notes also allowed for ongoing reflection, as I made regular notes during the document review, focus group, and interviews process. In seeking to give meaning to the study's data, a reflexive thematic analysis was utilized to organize and code for emergent material that could become themes.

Thematic Analysis

In approaching the data analysis portion of my dissertation process, I resonated with the concept of reflexive thematic analysis (Braun & Clarke, 2006, 2013, 2019; Byrne, 2022; Campbell et al., 2021). Reflexive thematic analysis (RTA) is a method used to analyze qualitative data that emphasizes the researcher's active engagement in the process. Through a reflective lens, researchers can uncover deep-seated themes and nuances, shedding light on the richness and complexity of human experiences. The integration of reflexivity can enhance the rigor, transparency, and authenticity of the research process, leading to a deeper understanding of the subject under study. Rather than an emphasis on reliability in coding, RTA stresses the importance of "the researcher's reflective and thoughtful engagement with their data and their

reflexive and thoughtful engagement with the analytic process” (Braun & Clarke, 2019, p. 594). Being a medical education administrator in a different diagnostic-focused specialty for a number of years, it was helpful to think about the data analysis this way as I knew my understanding of residency training programs and past professional experiences would inevitably impact my research findings and conclusions.

The process of RTA includes a number of interconnected steps including data familiarization, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and creating an analytical narrative or report (Braun & Clarke, 2006).

Figure 1

Phases of Reflexive Thematic Analysis

Analytic Phase	Description	Actions
<i>Data familiarization</i>	<ul style="list-style-type: none"> Immersing oneself in the data to understand depth and breadth of the content Searching for patterns and meaning begins 	<ul style="list-style-type: none"> Transcribing audio data Reading and re-reading data set Note taking
<i>Initial code generation</i>	<ul style="list-style-type: none"> Generating of initial codes to organize the data, with full and equal attention given to each data item 	<ul style="list-style-type: none"> Labelling and organizing data items into meaningful groups
<i>Generating (initial) themes</i>	<ul style="list-style-type: none"> Sorting of codes into initial themes Identifying meaning of and relationships between initial codes 	<ul style="list-style-type: none"> Diagramming or mapping Writing themes and their defining properties
<i>Theme review</i>	<ul style="list-style-type: none"> Identifying coherent patterns at the level of the coded data Reviewing entire data set as a whole 	<ul style="list-style-type: none"> Ensuring there is enough data to support a theme Collapsing overlapping themes Re-working and refining codes and themes

<i>Theme defining and naming</i>	<ul style="list-style-type: none"> • Identifying the story of each of the identified themes • Fitting the broader story of the data set to respond to the research questions 	<ul style="list-style-type: none"> • Cycling between the data and the identified themes in order to organize the story
<i>Report production</i>	<ul style="list-style-type: none"> • Presenting of a concise and interesting account of the story told by the data, both within and across themes 	<ul style="list-style-type: none"> • Writing a compelling argument that addresses the research questions • Writing beyond the simple description of the themes

Adapted from Braun & Clarke (2006)

Note. Reprinted from “Reflexive Thematic Analysis for Applied Qualitative Health Research” by K. Campbell et al., 2021, *The Qualitative Report*, 26(6), pp. 6-7.

In the following section of the chapter, I will describe my process following the above steps.

Data Familiarization

In this first analytic phase of RTA, I found the process of immersing myself in data familiarization and synthesizing to be longer and more tedious than I had anticipated. Perhaps naïve in the volume of data I would need to review, understand, reflect on, and make sense of, it was also eventually a rewarding feat to give thematic meaning to my participants’ experiences. When listening to the audio recordings of the focus group session and participant interviews, I found myself feeling thankful for my research participants’ candor and openness. I went back and forth on whether I’d have the recordings transcribed by a Research Assistant or not and, ultimately, I ended up transcribing the focus group session and two and a half interviews myself before handing the recordings over to a Research Assistant for their professional transcription. This ended up being not only a time saver but a mental capacity saver as well. I thought that engaging with the participant data by transcribing the audio recordings myself would help me to become deeply attuned to the data. While transcribing the data did enhance my engagement, the volume of work that entailed made the data feel heavy and burdensome. Having the transcripts

prepared by someone else gave me the space to review the content without feeling like it was another “job” I had to do.

I listened to the focus group and each interview recording while reviewing the transcripts in full two times. Once to ensure content and context alignment between the recordings and the transcripts and another time to actively listen to my participants without distraction of completing another task at the same time. Throughout both iterations I journaled and made notes on my initial thoughts and emerging themes. I also noted interesting comments and tidbits of information that stood out to me, providing a snapshot of the interview.

During this phase, I went back to review program-specific and Royal College-generated documents on competency-based medical education (CBME) that I had first reviewed prior to the participant research. This allowed me to make deeper connections with the documents and provide further context to comments participants made about EPAs, evaluation forms, and the overall structure of the CBD framework in Pathology.

Generating Initial Codes

During this phase of analytic review, I had contemplated using a qualitative data analysis software tool to organize my thematic analysis but ultimately decided to do the work and organization manually to keep me as closely connected to the data as possible. In my quest to generate codes and group data, I first went back to the focus group and interview transcripts and colour-coded and added comments to snippets of data that seemed to fit together. Since all of the transcripts are in Microsoft Word, I found this to be an easy process and it was exciting to see the data start to come together in a colourful way. I envisioned a rainbow of thoughts, feelings, and experiences just waiting for overarching meaning to be given to them.

Similar to the focus group and interview transcripts, I used colour-coding to organize and label initial themes that came up in the document review. Admittedly, I found the data not quite as interesting in the document review since they were program and Royal College-generated policies, EPA lists, and other competence by design materials. The documents' narratives weren't as rich as the participants', but they helped provide background to the overall framework within which the residency programs my participants belong to and they do still tell a story. Their rainbow of data weaves a structure for the operation of the Pathology programs but does not integrate the human factor of what it is actually like to undertake the outlined learning experiences which the participants brought to the study.

Generating Initial Themes

Once the initial coding of data was complete, I found the generation of themes to follow organically, since I had already started to contemplate how the data would fit together. Playing on the analogy of a rainbow which I had begun to consider in the previous analytic phase, I started to envision how the themes of the study could similarly fit together in overlapping striations of colour, each band of colour telling its own unique story but invariably linking to the next. I started to map the themes this way, considering what order they may fall in my report narrative so that they make sense and fully illuminate my participants' experiences. Using the guidance of Braun and Clarke (2006) and Campbell et al. (2021), I found it helpful to reflect on the emerging themes, defining their properties and meanings.

Reviewing Themes

After the initial colour-coding, mapping, and reflection upon the transcripts and documents, I went back through to review the preliminary grouping of data. A colour was tweaked here and there but, overall, the majority of the colours remained the same as the first

coding. After this review of the rainbow of data, I was happy to go back and give the tapestry of defined sections draft overarching theme names. I made notes and journaled my impressions and ideas regarding the themes. I also started to note where there was alignment between participant narratives and how their comments may fit together as grouped data under potential themes.

There was one instance where I thought a comment was interesting and had put it aside to use as a theme but came to realize that there was no other supporting data and that it could be grouped under different theme instead.

Defining and Naming Themes

After noting initial groupings of data with commonalities and draft theme names, I went back through my notes, looking for other threads that may be present. It was during this stage that my ideas around a cohesive narrative started to form. I reviewed the titles of draft themes and edited two of them slightly. I had begun to see myself as the prism through which the light of participant experiences would become a collection of organized colours ready to illuminate their shared narratives. Eventually, I generated five semantic (or descriptive themes) and one overarching latent (or interpretive) theme. Although Braun and Clarke (2006) note that typically one type of analysis is used, I found it helpful to align my interpretivist paradigm with the semantic analysis of participant experiences and to present a latent theme as a thread that intersects the descriptive elements of my data. I began to craft each theme's story and reviewed how they linked back to my research question and objectives to ensure alignment with my study's intent. These analytical narratives are explored further in the data analysis chapter.

Research Trustworthiness

Ensuring that my study was credible, reliable, and transferable allows the knowledge generated from my research to be collected and analyzed in an ethical manner while ensuring

that it is not only be beneficial to me, but also to interested readers while avoiding undue harm for my participants.

Credibility, or internal validity, was achieved through the crystallization of multiple research methods (as mentioned above) and respondent validation via member checks. Participants had the opportunity to review any direct quotes used in my draft thesis to ensure they felt comfortable with the information I shared and to ensure accuracy of their perspective. Furthermore, I integrated my unique reflexivity throughout my data analysis and dissertation to be transparent in how my positionality influenced my study. These impressions and reactions were recorded via journaling and field notes and are expressed through narrative reflection. Reliability, or consistency, was maintained by the use of an audit trail to log my activities and discuss my data collection methods, how I underwent my data analysis, and how I came to conclusions in my study. Daily logging of my activities was a part of my research routine. Also, regular check-ins and reviews with my PhD supervisor allowed for peer review of my work. I believe that, by using these varied methods of validity, I achieved the “deepened, complex, and thoroughly partial understanding of the topic” (Richardson & St. Pierre, 2005, p. 963) which crystallization provides.

Transferability, or external validity, was accomplished through ensuring user generalizability by using a rich description of my study’s context, site settings, and participants to ensure readers can envision how my study’s findings can be used in their own work. I believe that my study will be of particular interest to other educators within medical education and other professional programs who are using or contemplating using a competency-based or outcomes-based education curriculum approach.

Ethical Challenges and Provisions

The key ethical challenge in this study was maintaining participant confidentiality due to the nature of narrow participant selection. Because the only participants selected for the study were from one department's residency training programs at the same university, I knew it would potentially be easy to identify who the participants were if I was not careful with the presentation of the data. To ensure transparency, this concern was outlined in the "Invitation to Participate: Focus Group" and "Letter of Invitation to Participate: Interview". Learner participants are of special concern, as I wanted to ensure that they felt comfortable being honest with me and were not worried that any negative or constructive comments they share about competency-based medical education would have negative consequences for their training or with the Royal College. To circumvent this procedurally, participants' real names were not used in my findings and each was assigned a pseudonym. Furthermore, although the names of the specialty programs of which the participants are members are used to provide context and nuances of the specialty, institution names of the participants' university and hospital workplace are not used. During the data analysis, close attention was paid to present the data in a way that would not identify individuals.

During the data collection process, I offered that, if concerns arose, I would meet privately with concerned participants to discuss their unease and provide further clarification on how confidentiality will be maintained. However, no participant concerns were raised. I also reiterated the information they received on the letter of Invitation to Participate, noting that they could leave the study if they believe it is in their best interest to do so, but any data collected to that point would still be included in the data analysis unless they explicitly asked for it not to be included. No participant elected to leave the study or have their data removed from the analysis.

Ethics approval was obtained from St. Francis Xavier University's Research Ethics Board and Dalhousie University's Research Ethics Board.

Chapter Summary

This chapter provided a detailed account of the study's research design and methods. Through case study inquiry using a lesser studied (or "instrumental") case, unique data was garnered through document analysis, participant research via a focus group and individual semi-structured interviews, alongside researcher notetaking and journaling. Reflexive thematic analysis was explored, as was the study's ethical considerations. A deeper exploration of the data generated from the research methods continues in Chapter 4: Document Analysis and Chapter 5: Further Research Findings and Data Analysis.

Chapter 4: Document Analysis

I began the data collection phase of research with document analysis between January-March 2023. During this phase, I reviewed program-specific and Royal College-generated documents on competency-based medical education (CBME). Documents from the Pathology programs included curriculum maps which laid out where and how the mandatory outcomes or “entrustable professional activities” (EPAs) could be achieved organized by stage of training, quick reference cards for faculty and residents further exploring where and how EPAs could be achieved, and a sample of an “EPA Audit Report Card” which is a letter sent annually to each faculty member with a bar chart showing their form completion statistics in comparison to the department average. There was also a link on this letter to a page on the Royal College website named “Alleviate resident stressors: 7 important EPA tips” so I considered this document a faculty development resource. Other Royal College documents reviewed included the full published lists of EPAs and their subpoints or “milestones” as dubbed by the College, for both the General Pathology and Anatomical Pathology programs. I also reviewed relevant resident-focused CBD messaging and guides from the Royal College which are publicly available on the organization’s website.

Cleland, MacLeod, and Ellaway (2023) offer a comprehensive reporting framework for analysing documents in health professions education, ensuring methodological clarity and rigor. To summarize, the framework emphasizes the need for clear identification and rationale for document use, including specifying the nature, origin, and eligibility criteria of documents within the study. Cleland and colleagues advise to outline document collection methods, assess document quality, and consider the influence of researcher reflexivity and positionality on the data. With this framework in mind, a review of pertinent documents to this study follows.

Program Documents

The Program Administrator for the General and Anatomical Pathology programs kindly emailed me the various CBD documents that they use as faculty and resident resources in their department. As noted above, these included curriculum maps for General and Anatomical Pathology, EPA quick reference cards for each stage of training in each program, and a sample “EPA Audit Report Card” used for departmental faculty. These documents were not available publicly, only internally to program stakeholders. All documents were saved in my research file folder on my encrypted USB drive.

The curriculum maps were aptly titled “AP EPA Mapping to Curriculum” and “GP EPA Mapping to Curriculum.” Both were Microsoft Word documents that first listed activities in the residency training programs where EPAs are covered, organized by stage of training and then by each individual EPA. For example, in the Anatomical Pathology program, listed under Transition to Discipline (the first stage of training undertaken as a PGY1), the learning experiences in which a resident can fulfill EPA #2 are listed as two academic half day-presentations and one autopsy that is supervised and reviewed by a PGY2. On the last page of this document there is a table outlining the mapping of each EPA to specific clinical rotations. This table is organized by postgraduate training year, then rotation name, and finally EPAs that should be covered on that rotation. In terms of the EPA noted above (EPA #2 in Transition to Discipline), it is noted that this EPA is covered in the Transition to Discipline rotation in PGY1. This rotation takes place as the first rotation block of residency in the Pathology department. These curriculum maps provide a succinct snapshot of when and how learners can achieve the various mandated outcomes set forth by the Royal College. They provide a brief overview of how the Department of Pathology

plans learning experiences and can provide a high-level roadmap for learners in the residency training programs. They do not, however, provide any detailed information about the EPAs.

Moving on to the EPA quick reference cards, I could see the connection between the high-level curriculum maps and the more detailed reference cards. These documents were in a PowerPoint format and also organized by stage of training. There was one document for the first two stages of training (Transition to Discipline and Foundations of Discipline) for each program, and another document for the third stage of training (Core of Discipline). Documents for the final stage of training (Transition to Practice) were not available at the time, as the programs were still a year away from having a resident in that stage. The introductory slide to each stage of training highlighted the entrustment scale used by the department's program. Similar to the original "O-Score" scale, it was numbered 1 through 5 with behavioural anchors including "1 – I had to do", "2 – I had to talk through", "3 – I needed to prompt", "4 – I needed to be there just in case" and "5 – I didn't need to be there". It also noted under the scale that a rating of 4 or 5 was required for an EPA to be considered "achieved". Although this slide noted that the anchors had been adapted by a Pathology faculty member, I noted that the scale was still grounded in vocabulary used to describe observations of learning moments in more procedural-based specialties. In my experience in a different diagnostic-focused specialty where the team had researched and developed a specialty-specific scale reflecting the learning dynamic of that environment, I wondered how Pathology's scale would fare in practice. I made a note to ensure I gained more insight about how this evaluation scale impacted the study's participants.

Beyond the introductory scale, the slides detailed one EPA at a time, organized in numerical order. There was a heading with the title of the EPA, followed by a table outlining the EPA description, a checklist delineating the number of achievements required and by whom an

observation of achievement could be garnered from (i.e., if and whom beyond a faculty member it is acceptable to have supervise a learning experience and have complete an EPA evaluation form for that experience). And, lastly, a “Clinical Scenario” column which offers a description of where learners can obtain the educational experiences required to fulfill the EPA. Carrying on with the example of EPA #2 in Transition to Discipline, the quick reference guide notes the EPA description as “Summarizing relevant clinical information for clinicopathologic correlation” and then provides a more detailed functional summary of “Extracting clinical information, including clinical history, relevant laboratory and imaging results from a number of different sources (including electronic), interpreting this information in light of the clinical question, and providing a summary.” Under the checklist heading it states that two to three observations of achievement are required and that evaluators can include a Pathologist or a resident in their Core of Discipline or Transition to Practice stage of training. Finally, in the Clinical Scenario column, it is noted that the requirements to fulfill this EPA can be found in teaching sessions with Pathology faculty and in a “Clin-Path correlation presentation.” The quick reference cards are as described – A resource which provides learners and faculty with an overview of the details of each EPA. From an educational perspective, I can see how these reference cards could help learners envision their learning path and assist in breaking down the CBD framework into tangible amounts of learning. I was, however, left wondering how the reference cards came to fruition and if they were created by one or more faculty members or if this was a task that residents were also engaged in. I was keen to find out more about these documents during participant research and recorded a note – Were these resources an empowering tool which shared agency with learners in order for them to take ownership of their educational experiences?

Lastly, I reviewed a sample “EPA Audit Report Card” which the Anatomical and General Pathology programs use to provide faculty members with feedback on their EPA completion rate. This document is formatted like a letter, addressed to individual faculty, and includes a bar chart collating a summary of all “medical laboratory staff averages” in blue and the individual faculty completion rates in green. Ahead of the chart, there is a short paragraph stating, “EPAs are the cornerstone of Competency Based Medical Education. These serve as documentation of assessment for learning. We thank you for contributing to this process and for your ongoing commitment to residency education.” The chart then provides four categories of comparison: number of EPA forms the faculty member was sent, the number of EPA forms they completed, the percent of total form completion, and the average time taken to complete a form in days. In the example I was provided, the statistics in the letter were for the 2021-2022 academic year. The faculty member’s name had been redacted but their individual versus department-wide figures were included: They were sent 19 EPA forms versus a department average of 45, had completed all 19 of their forms versus the 41 on average, giving them a 100% versus 86% completion rate. And their average time to complete an EPA form was four days versus the departmental average of nine days. Following the chart, there is a reminder for EPA evaluation completion, “Successful integration of EPA assessment into teaching includes commencing every teaching activity with the selection of a case for assessment (be it random or after discussion with resident regarding their learning needs). A combination of the two is probably ideal.” It then concludes with a reminder of in-house CBD resources, listing the faculty members who are the Competence Committee Chairs and residency Program Directors. It concludes with a link to an online resource housed on the Royal College website titled “Alleviate resident stressors: 7

important EPA tips” (Royal College Staff, 2021). Overall, I thought this report card provided a good opportunity for faculty to see how they fared in comparison to the average faculty member in the department. I noted that the accountability of having one’s completion statistics collated on an annual basis could potentially be a motivator for some faculty to complete the EPA forms that they are sent in a timely fashion. These work to ensure that EPA forms are completed in general so that their annual completion statistics are favourable. From my experience, these types of statistical comparisons are effective in enhancing accountability and engagement for a couple of years and then begin to lose their effect.

Royal College Documents

Taking advantage of the publicly available suite of documents on the Royal College website, the first documents I read through and made notes on that were authored and published by the College were the “Entrustable Professional Activities for Anatomical Pathology” (2022) document and the “Entrustable Professional Activities for General Pathology” (2019, 2023) document. These comprehensive documents are 53 and 59 pages long respectively and outline the name, key features, assessment plan, and CanMEDS milestones for each EPA. The document is organized by stage of training and EPAs are presented in numerical order. This is the same information which is included on the programs’ quick reference cards, with the addition of suggestions for evaluation form use and the full list of milestones. Continuing with the example of EPA #2 in Transition to Discipline in Anatomical Pathology, the name and key features are the same, as is the assessment plan with the addition of an evaluation form suggestion of “Use form 1. Form collects information on: Location: surgical pathology; cytopathology; autopsy pathology; other” (p. 3, 2022). It then lists the seven CanMEDS milestones covered in the EPA. These documents are very long and extremely detailed. It is clear why EPA reference cards that

are easier to engage with were created by the program. In my experience, I noted that expecting learners and faculty to review and absorb the information in these comprehensive documents from the Royal College is not realistic.

I then went on to read and make notes on the other accompanying program-specific CBD documents including the “Anatomical Pathology Training Experiences” (2022) and “General Pathology Training Experience” (2019) guides. These guides include the required and recommended training experiences for the programs, organized by stage of training. Each stage of training is introduced by a brief summary of the focus of that stage and is followed by the required and recommended training experiences for that stage each with its own heading and then sub-headings of “Clinical training experiences” and “Other training experiences”. These documents are shorter in length (8 pages for Anatomical Pathology and 10 pages for General Pathology) and provide an overview where programs should plan for their residents to have the learning opportunities to fulfill their EPA requirements. This information is the source for the “Clinical Scenario” information noted on the programs’ quick reference cards. Much like the full EPA guides, these documents are comprehensive and likely not all that helpful for faculty and residents in their daily teaching and learning encounters. Their use is likely more functional for administrators and Program Directors working behind the scenes to create faculty and resident resources (like the quick reference cards) and ensure accreditation standards are met.

Lastly, I studied and took reflective notes on resident-focused CBD messaging and guides on the Royal College website. The College has developed a comprehensive suite of publicly-available documents on their website: <https://www.royalcollege.ca/en/cbd.html> and have organized the materials into four sections: Understanding Competence by Design, How to Implement Competence by Design, The Impact of Competence by Design, and Important

Contacts and Links. The materials here range from information listed on a webpage, PDF documents, PowerPoint presentations, and videos. As there are hundreds of resources available, it is helpful that there is a resource directory with a search function available for use. A user can search by topic area and/or user type. Curious to see how many learner resources were available, I did a search of all documents by user type of “Resident”. The search garnered 16 results, of which only five were specifically targeted to learners. The other 11 were generic resources which had topics which may be of interest to anyone involved in CBD. Interestingly, searching by “Faculty” garnered 32 results, by “Program Administrators/Managers” 41 results, and by “Program Directors” 79 results. There is also an option to search by “Medical Student” which brings up seven of the same resources that appear for residents. I noted the correlation between the literature noting that much of the focus on implementing competency-based medical education has been on the implementation process and faculty development, with learner development and resources having a secondary focus.

Of the five documents geared specifically towards residents, there is one 55-slide PowerPoint deck titled “A Resident’s Orientation to CBD Presentation” (2020) which is a resource intended for Program Directors to update with program-specific details to share with their residents. The goals of the presentation listed on the fourth slide include items like “Explain to a colleague what CBD is and the rationale for its use in your medical training,” understand CBD terminology, be able to describe the CBD approach to medical education, and “Understand your role as a resident in a CBD world”. After reviewing the slide deck, I would say that the goals are reached. However, there is a focus on observations of patient interactions and clinical procedures to fulfill workplace-based assessment criteria which does not translate to diagnostic-focused specialties. There is no distinction of attributes relevant to procedural-based specialties

versus diagnostic-focused specialties. I saved this document in my research file folder on my encrypted USB drive.

The remaining four resident-specific documents were PDF documents meant for direct circulation to learners. The first titled “Competence by Design (CBD): What You Need to Know A Resident’s Guide” (2017) is a four-page summary of the CBD framework and outlines the key components of the framework. It also includes a “CBD: Benefits for you” section, claiming that learners will be provided with:

more frequent assessment and meaningful feedback from faculty, well-defined learning paths and clarity around the competencies needed to progress to next stages of training, a learning plan that focuses on personal development, the chance to prepare for independent practice by honing skills and working more independently during the final stage of residency (p. 1).

The guide then goes on to outline the key components of CBD, including EPAs and CanMEDS milestones, observations of training experiences and workplace-based assessments, the intention of coaching conversations with faculty, a description of summative assessment completed by Competence Committees, a shift in exam timing, and noting further resources. It also mentions “flexibility that allows you to focus on your personal development” and “...learners may progress through their residency at different rates” (p. 3) which sounds promising from a learner perspective. However, in practice, this has not come fruition and we now know that CBD program completion is linked to both outcomes-based and rotation time-based requirements. Also included in the College’s resident-specific resources is a one-page document titled “Competence by Design Residents: Key things you need to know” (n.d.). This is a one-page

poster summarizing the key points of CBD that are noted in the four-page guide outlined above. It is not dated, but since the content is the same I assume it was drafted in 2017 as well.

Thirdly, a document titled “Residents: Top things you should know about Competence Committees” (n.d) is also listed. It is a four-page PDF document which defines the purpose and membership of Competence Committees along with information on frequency of meetings and how the group makes decisions on a learner’s progress. Furthermore, information about how a learner will be informed of the committee’s decision and how they can appeal a decision is included. I noted that this transparency is helpful for learners. And, although the document is not dated, the information appears to be correct. The fourth document that is listed, titled “A resident’s journey to certification” and described as a one-page infographic on how a resident’s path to certification changes in CBD is unfortunately not available to view. The link brings the web user back to the Royal College’s Newsroom page. These documents were also saved in my research file folder on my encrypted USB drive.

Overall, I noted that the resources publicly available for residents on the Royal College website were not overly beneficial for Pathology residents. Although the background information on various elements of CBD was informative, having updated resources for both procedural-based and diagnostic-focused specialties would be helpful. The College would also benefit from having more learner-specific resources available for residents, not only for enhanced messaging and engagement, but also to share agency with learners and show that their development is valued as much as their faculty and administrative counterparts. Realizing that learners had been the lesser focus of the formal resources developed and the overall implementation plan by the Royal College, I was very much looking forward to discussing the actual educational experiences with my study’s participants.

Chapter Summary

In this chapter, I reviewed the process I undertook to ensure a detailed analysis of documents from the Pathology program and Royal College was encompassing. While the Pathology resources were helpful in understanding the required competencies for the specialty, I was left wondering how supportive to learning they are in practice. And, although the available Royal College resources are useful for high-level information, specialty-specific or even resources for procedural-focused and diagnostic-focused specialties would be more beneficial for residents as they learn to navigate the unique nuances of a competency-based medical education program through the lens of their specific program. The conversations with resident participants about these nuances and educational navigation is explored in Chapter 5: Further Research Findings and Data Analysis.

Chapter 5: Further Research Findings and Data Analysis

After obtaining Research Ethics Board approval from St Francis Xavier University in early December 2022, I embarked on the data collection phase of my research. Between January-March 2023, alongside participant recruitment, I had the opportunity to undertake document analysis before meeting my participants for a focus group in March 2023. Following the focus group, I then met with each participant individually, modifying the semi-structured interview guide slightly to elaborate on the thoughts, ideas, and concerns of each participant. Throughout the process I kept field notes and journaled my thoughts and impressions and went back to the documents for reference. In this chapter, I discuss the findings of my participant research and present a discussion of the five semantic (or descriptive) themes and one over-arching latent (or interpretive) theme which comprise my dissertation findings.

Participant Research

Between March and May of 2023, I had the pleasure of meeting and conversing with six participants who were residents in Pathology residency training programs. First in an in-person focus group with everyone present and then in individual interviews either in-person or online, I learned about participants' experiences and perceptions of being a postgraduate learner in an outcomes-based curriculum. The participants ranged from first-year to fourth-year trainees and provided incredible insight into their learning experiences in a competency-based residency training program. In this chapter I present the findings of my data collection and research I employed using reflexive thematic analysis. But first, an appreciation and introduction to the six participants who shaped my study via narrative portraits.

Participant Portraits

The purpose of this section is to provide the reader with a contextual starting point in understanding the study participants. By situating the participants in description and with their own words of how they first encountered competency-based medical education, I intend to add transferability to their experience and lend insight into the thematic analysis.

The participants were all residents in either Anatomical Pathology or General Pathology at a Canadian medical school. To maintain their confidentiality, I am not specifying which program each participant was enrolled in, just their postgraduate year of training. The Anatomical Pathology and General Pathology programs these learners were enrolled in are housed in the same Department of Pathology with the same faculty members. The main differentiating factor of the programs being that Anatomical Pathology is a branch of Pathology focused on examining specimens from organs and tissues acquired through surgery and General Pathology focuses on examining specimens acquired primarily through bodily fluids as well as organs and tissues. Although the programs have different Program Directors and a different suite of outcomes (also known as “entrustable professional activities” or EPAs) set forth from the Royal College, a number of the outcomes are the same across both programs, and some clinical rotations and rotation objectives are also shared between the programs. Residents in both programs interact regularly, sharing a resident room and attending teaching sessions together. Overall, the experiences of the learners are similar since they have the same teachers, learn in the same clinical department with the same clinical staff, and attend resident meetings as group.

In asking about participants’ pathway to Pathology, I was asked to keep some personal details confidential. As such, I will note that participant experiences and their motivation to pursue a career in medicine varies from an interest in the human body and its biology, to having

been exposed to medicine as a profession from having family in the field, to wanting to make a difference in patients' lives. In terms of Pathology, participants shared that their interest was developed during exposure to the specialty via other professional and academic experiences, and realizing through medical school that they were interested in various aspects of the specialty. In terms of age, participants ranged from 25-30 years to 40-45 years old. When asked what ethnicity participants identified with, four identified with ethnicities that are considered to be visible minorities in Canada and two identified as being Caucasian. Participant names have been changed to a pseudonym to maintain confidentiality.

Dawn. Dawn was a first year (PGY1) resident who entered the Pathology program after experiencing an outcomes-based curriculum in her clerkship (third) year of medical school at a different Canadian university.

So, we had 14 EPAs that were just kind of very basic - I found that [other university] really tried to train us into the stream of family med. So, it was kind of like there were 14 EPAs that were very much like, be able to take a history from a patient, be able to do a physical exam on a patient, be able to describe your findings to your supervisor, stuff like that. So, it was 14 of them that you had to show competency in, in order to pass clerkship. So, kind of like EPAs that we do here, but just not as much of a load.

Based on informal chats before the focus group and her interview, she struck me as an easy-going and adventurous person. She attended both the focus group and interview in-person, the latter of which took place in my office. She arrived on time and appeared relaxed and enthusiastic during our conversation.

Gordon. Gordon was a first year (PGY1) resident who entered his Pathology residency with some understanding of the competence by design (CBD) framework from his peers and from messaging received during medical school.

I remember it was at the beginning of med school. And the school was talking about how in residency they're moving towards these CBD programs. And one of the things that they really tried to flash at us about why it was so great, was that you would be able to finish sooner. And so, then sort of talking with my colleagues about it afterwards, the impression we had was that it was about being able to stratify students, so that students that need more time can get more time, and students that need less time can get less time. And the whole objective-based aspect, where you're sort of getting at these concrete things, and if you achieve them, you're done.

Gordon was friendly and had an endearing way about him, carrying himself with quiet composure. He attended the focus group in-person but opted for a virtual interview over Microsoft Teams. He joined our interview from his home (with me at my home as well), pleased to have the opportunity to meet virtually while he had some time away from his clinical and academic work.

Rose. Rose was a first year (PGY1) resident who first learned about CBD during the interview process for residency. She had read the program's online description which included information about its rotation design within the CBD framework. This was supplemented with a program document outlining more in-depth information and conversations with the Program Director and senior residents upon joining the program which she found helpful.

Yeah, the path, like the CBD, the EPAs, the pathways. We all received the information.

And we also had some conversations with the program director, and [they] gave me some information about it. And I also talked with the senior residents.

Rose was inquisitive and thoughtful with her answers. She ensured she fully understood my questions before answering them and seemed to enjoy hearing about her colleagues' experiences

in the focus group. She attended both the focus group and interview in-person, showing up a bit early for both. The interview took place in my office.

Andre. Andre was a third year (PGY3) resident and had been introduced to an outcomes-based education curriculum in a laboratory technician program he completed before medical school. Although, admittedly, it was a different construct than the CBD framework he encountered upon entering residency.

Kind of yes, similar to a certain extent. Yeah, kind of a different setting, I guess it was more for just tracking our performance. Kind of like it's a similar idea, but maybe just a very different setting.

Andre was kind and a bit quiet, taking his time to give insightful responses. He was thoughtful and had a calming presence during our interactions. Andre took part in the focus group in-person but quickly took me up on the offer to have his interview virtually on Microsoft Teams. Andre's interview was the first individual interview of the study taking place on the Sunday evening (with both of us joining from our respective homes) following the focus group on the Tuesday prior.

Lynn. Lynn was a third year (PGY3) resident who first heard about CBD when applying to residency programs, via the online descriptions posted through the Canadian Residency Matching Service (CaRMS), an online portal through which all first-year residency positions are allotted.

I think I might have, like, heard the term previously as a medical student being exposed to different, like, residency programs. When we do our core clerkship, we interact with other programs, obviously, but I'd never really took that like... I never looked into it until it was applicable to me, I guess.

Lynn was friendly with a calm demeanor. I enjoyed our interactions, as she made me feel at ease with her openness and engaging presence. Lynn took part in the focus group in-person and online via Teams for her interview. She joined me online from her home for her interview, with me at home as well.

Allison. Allison was a fourth year (PGY4) resident who entered the Pathology program as a member of the first CBD cohort for the specialty. She had initially experienced a competency-based curriculum in her undergraduate degree in laboratory sciences but found the transition to a CBD curriculum in residency to be a bit daunting.

I think that the actual information was probably lacking. I think the idea of why we were doing it, or why it was shifting, was made, maybe not clear, but at least there was an attempt to make that known. But the actual intent of it and the outcomes that were expected, and how that was actually going to get implemented, that was—that was definitely lacking. And moreover, we didn't really get information about the exam, but just said you'll write it in your fourth year. We didn't get exactly like information about the competencies and so, we just kind of had to move through them in real time. So, it's been tricky that way.

Allison was enthusiastic and very open to sharing her experiences. Informally, we discussed medical education design and research which I enjoyed. She attended the focus group in-person and opted for a virtual interview on Microsoft Teams which she joined from the resident office in Pathology and I joined from home.

Summary of Participant Portraits

I was glad to have a mix of junior and senior residents take part in the study. Their variance and breadth of experiences aided in creating a tapestry of themes and insight into the

learner experience in their specialty. A common sentiment shared among the group was how pleased they were to have the opportunity to talk about their experience and how they felt that my research study was both valuable and much needed. As both a social science researcher and medical education administrator, this was a delight to hear and gave me renewed motivation to carry through to my thematic analysis.

The Focus Group

Participant research began with a focus group on March 3, 2023. I welcomed the study's six participants to an evening get together in a conference room located in the Diagnostic Radiology department at a tertiary care hospital. I provided the participants with food and refreshments for a suppertime conversation about their experiences in a competency-based medical education program. The timing was planned so that participants could join me at 5:00pm, just after getting off work for the day and before going home. They were all working at various locations within the same hospital that day so a gathering in a conference room on-site not only made for a convenient location for me (as my work office was next door to the conference room), but for the participants as well. Given that the Anatomical Pathology and General Pathology programs have only 10 and 12 residents respectively, residents are familiar with one another and seemed collegial and enthusiastic upon arrival. Once everyone got settled and had the opportunity to eat, I began the focus group session. Introducing myself in my role as the researcher, I gave an overview of the study's purpose and reiterated that I would be using a semi-structured interview guide with an open-ended intent to capture other ideas that came up. A summary of the group conversation follows, with headings organizing the initial themes developing from the discussion.

Initial Understanding Versus Reality. To begin the conversation, I asked participants what their understanding of competency-based medical education was and how they initially learned about this educational approach. In terms of where participants initially heard about CBME, responses varied with two participants being exposed to an outcomes-based curriculum approach in other formal pre-residency programs, three learning about CBME during their residency interview process, and one participant remembered hearing about competence by design (CBD) during medical school but didn't experience its attributes first-hand. What was interesting about this discussion was that, regardless of where the participants had first learned about competency-based framework for medical education, it became apparent that what they had learned about the approach was not what actually happened in practice in their residency program.

Lynn, the PGY3 Anatomical Pathology resident, was the first to respond to the opening question, noting that she learned about CBME when applying for residency programs, her impression was that learners in a CBD program would be able to progress at their own pace as they completed their assigned entrustable professional activities (EPAs). However, upon beginning her residency program, she learned that this was not the case in the CBD curriculum. Allison, the PGY4 General Pathology resident, agreed, noting that this was the impression she also understood when entering the program. She explained:

The idea was that if you can finish [the requirements for a] residency early, you could finish your residency early. So, if you could get all of your competencies done, then there's no reason to be here for the full five years. I think that's since changed, so there's that.

Gordon, PGY1 General Pathology resident, who first encountered the idea of CBME in medical school 2 years before, also thought that being a learner in a CBD program would allow him to progress through the program at his own pace. He recalled his first impression of CBME:

It was a way for people who were able to get their competencies quickly to finish earlier and people who needed more time to finish later. And it was going to stratify these people throughout their education so that people could, you know, go at the competencies at their own pace. And we wouldn't be restricted to this, like, time-based session. That was a while ago; I have changed my opinions.

Although it was not included in the focus group guide, I wanted to hear more about how this initial perception versus reality affected the participants. I asked them how it made them feel when they realized that what they thought the CBME framework would provide to them (i.e., potentially a shorter residency program) would not actually come to fruition. Gordon, appearing to be resigned, summed up his thoughts succinctly with, "My gut feeling was like, 'what's the point?'" Dawn, PGY1 resident in Anatomical Pathology, expressed frustration that she was able to complete all necessary EPAs early in the academic year but then still had to complete a number of non-Pathology or "off service" rotations in order to move on to the next stage of training. Andre, PGY3 resident in General Pathology, agreed with this sentiment, noting:

there's still a discrepancy between what we need to achieve and what we're actually doing with the time. So, the whole structure and the whole scheduling still remains similar, relatively similar, to what it was before, but then there's all these extra refinements.

To which Allison continued, somewhat resentfully, “Yeah, and all the paperwork.” This comment acquired an acknowledging response from the other participants, with them agreeing with her sentiment on the extra paperwork required in their CBD program.

The Resident-Faculty Dynamic. Piquing my interest was the general acknowledgement that CBD added an extra layer of paperwork in the form of managing a large volume of evaluation forms. I had not planned to discuss this extra work with participants but, since it seemed to be a shared experience of the group, I asked them what their experience has been like in getting support from faculty in managing and completing their EPA forms. There was a general consensus that faculty support and faculty understanding of EPA forms varied from one person to the next. And, as Allison noted, the residents who experienced the competency-based framework at the onset of the transition to CBD ended up having to coach some faculty in their use of the forms. In Allison’s words:

Being that first cohort, it probably took a good at least two years to really get a majority of the staff members on board. And, even then, you’re trying to coach them through how to evaluate you. Which also felt really inappropriate... And there was this incredible amount of discrepancy between each of the staff members who are actually evaluating you. Some of them are trying to evaluate you as a junior colleague. Some of them are trying to evaluate you against their own expertise.

The other participants voiced agreement with Allison’s sentiments, noting that faculty are not always aware of EPA assessment expectations. This sometimes leads to a disconnect in feedback received in-person versus the feedback that is record and submitted on an EPA form. This then accounts for residents not passing an EPA when they thought they would.

Continuing on this point, I asked how this dynamic affects learning experiences. Andre, still outwardly calm, explained that the disconnect had led him to alter his interactions with some faculty and that he would filter the questions he asked when on-service with them so as not to affect the outcomes recorded on an EPA form. He noted that, “you start worrying about asking questions during sign-outs. In particular when we’re talking about EPAs.” Allison and Lynn, their tone showing slight exasperation, echoed this experience, and Allison went on to explain that this not only discouraged question asking in real time, but it also meant that “it has actually burdened senior residents more because junior residents are asking to review with a senior before they review with their staff so that they can answer those questions and still appear knowledgeable.” This, in turn, has changed the workflow in the resident room. Lynn went on to explain that residents have become aware of faculty evaluation styles and know whom they can expect to receive what is perceived as a fair EPA assessment from, to the point that it sometimes affects their behaviour while working with them. She explained that:

I think that you almost get to know EPA styles because there’s some staff that I feel totally comfortable just being myself, asking as many questions as possible, and I feel like that is not a detriment to me as a learner, like in an EPA sense. But then if you have one of those negative reactions with staff where you get an EPA back because you ask a question, then you remember that for your next EPA. So, I think it is very staff-dependent on how I approach the whole EPA asking and getting.

The group went on to note how this creates an especially awkward dynamic in Pathology, where learners spend so much time working alongside faculty during their clinical practice and training. Andre explained that, to his knowledge, CBD was initially designed with procedural-based specialties in mind, whereas, in Pathology, residents learn alongside faculty through

interpretation and discussion of clinical cases. He went on to explain that “the application of EPAs, particularly in Pathology, I find quite challenging because the expectations are not clear. The, well, just the experience is not very clear to us.” Allison echoed this sentiment noting that she had worked on cases with staff members where they needed to get a second opinion of another staff member who had more expertise with a particular organ system. When receiving her EPA assessment form for that case, she explained that she didn’t pass the EPA because it was a difficult case and she needed help from another faculty member. Yet, so did the faculty that she was working with, so it was a frustrating experience. Continuing with the notion of unclear expectations, Gordon extrapolated this notion to other departments and noted that, during his off-service PGY1 year that he was currently in, he had learned that:

expectations of the different services are very different. And on one of my rotations they’re like, ‘we only give a passing grade which is a four or five, to residents in post-third year.’ And I was like ‘Okay, well I can’t pass my off-service block.’

Bringing the conversation back to Pathology, participants noted that this variance of expectations exists within their home department and is evident between various clinical sections of the department as well. Lynn, PGY3, explained that:

I found that there must have been some meeting explaining CBD... And it was, ‘Oh, we just had this whole meeting thing about CBD and the point is that you’re going to have to show progression.’ ...And it’s so artificial because they literally said, ‘Oh, you did a really, really great job on this case. Can I give you a four? Is that okay?’ And I was like, ‘Yes, yes, it is. I got plenty of threes, it is okay.’

Further on the effects of CBD in the learning environment, Allison explained how the learner-coaching-faculty dynamic, coupled with the general management (e.g., tracking, sending,

following up), of EPAs is disruptive to learning because of the mental load it adds to the resident experience. Lynn added that the total number of EPAs required seemed like an arbitrary number set forth by the Royal College. To put it pointedly she explained:

So, it all just feels like fake and not based on any evidence. So, I wonder if all of this was just implemented early because all the surgical specialties were doing it. And then all the, you know, Internal Medicine and other Royal College specialties were doing it. So, then it just felt, because we are a Royal College specialty, we need to do this as well. But I just question how much thought was put into it.

Andre, supporting Lynn's view, reiterated that CBD, "in theory is the ideal way of learning but in reality is very different."

Lack of Acknowledgement for Prior Learning Experiences. Allison went on to note that, for a learning framework that promises to be learner-centered, she was surprised that her previous experience as a laboratory technician is not considered when being evaluated by faculty members. And, because some faculty believe they need to evaluate residents in a way that shows progression, she experienced times when she completed an EPA to full completion only to receive an incomplete passing grade such as a three out of five. Allison explained:

So that's very, very frustrating coming from a very technical background where that was my job... And now I am doing all of that work again and then told that I am not competent at it. And that's really hard, as an adult learner, to not have your previous experience acknowledged at least.

EPAs Provide Structure and Motivation. Shifting the focus of discussion, I was curious to know if participants had any positive educational experiences in CBD. Lynn, PGY3, opened the dialogue on this item, noting that she had worked with some faculty who are

supportive of EPA completion and will prompt an EPA goal to focus on. She explained that this faculty member prompt allows her to be more mindful and thorough with her reports, and it is a benefit to know that a formal evaluation is on the way from that faculty member. Allison noted that she was looking forward to seeing what her PGY5 (and final) year of training would look like, as that year promised to be more tailored to her learning needs before she completes residency. Gordon, PGY1, went on to express his appreciation for the structure that EPAs and milestones added to an educational experience. He explained, “The EPAs are nice because I could be like, ‘Okay, these are all the separate things. And then once I can do these things, maybe I can do, like, a whole case myself.’” He did, however, note that although this set-up does lend nicely to procedural-based elements of learning, it does not always add as much to the “diagnostic side of Pathology.” Rose and Dawn, both PGY1 residents, agreed that the added transparency of outcomes was a benefit while completing their off-service rotations during their first year, with Dawn noting that this can also lead to “more opportunities to receive feedback.”

Extrapolating on the positive aspects of CBD, I asked the participants what they liked the most about the CBD framework. Andre, PGY3, noted that having set outcomes in the form of EPAs motivates him to take on more work in order to focus on EPA completion. Allison, PGY4, agreed with this notion, but went on to explain that this mentally often leads to a different way of learning because:

you’re not encouraged to take on that thing that you’re really afraid to do because it will take you so long because you have X number of EPAs that you need. So you’ll take on four smaller cases instead of one larger one.

Andre agreed with this sentiment, noting that “It [the mandated EPAs] does give you the quantity but, the quality, I don’t know.” The implications are significant: Residents feel the need to pick

and choose what they do to fulfill their mandated EPA targets, which is sometimes not the most beneficial for their learning and development.

Room for Improvement. Moving on, I asked participants that, if they could change one thing about CBD that would benefit learners, what would it be? Immediately two of the participants sarcastically said it would be nice to have the framework operate as “it was actually sold as” and “progressing at a fair pace” which garnered chuckles of agreement from the group. Rose, PGY1, went on to note that, although the EPA evaluation forms are meant to encourage objectivity, how faculty complete them is often subjective because faculty understanding of the scales often differ from one person to the next. Gordon, also in his PGY1 year, agreed, offering that it would be helpful for a grading rubric to be provided to faculty to aid with consistent objectivity. Allison, PGY4, continued this thought, explaining that it would also be beneficial if the EPA scales were specialty-specific to help reflect their learning environment in Pathology. She also noted that it would be beneficial to have PGY level-specific scales available to assure learners that they are progressing as is expected of someone at that point in their training. Allison shared that, in speaking with other residents, others also found it difficult to receive a non-passing EPA evaluation (i.e., a form where they received an overall score of 1-3, instead of a “passing” score of 4-5) and not have a clear idea if they were progressing as they should. She explained:

you don't know if people just think you're terrible because you're not passing EPAs.

You're talking to a group of very ambitious, high level and high-achieving individuals...

And then you're consistently getting feedback that says, 'Sorry, try again'.

She went on to further explain that this dynamic can affect learner self-confidence and cause self-doubt. The group then went on to discuss the utility of EPA in Pathology, with Lynn, PGY3,

explaining how EPA completion ends up feeling like a check mark in one45 (the online evaluation platform), rather than actually helping her learning. She shared that:

I'm treating EPAs as checkboxes and not actually looking for the feedback because I feel like... There's so much one-on-one time in Pathology that it's very hard to not get direct feedback because you're sitting right next to your staff for hours a day.

There was general agreement with the point that EPA evaluation forms are essentially redundant.

Unique Experiences and Final Thoughts. At this time, we were at the hour mark of the focus group, so I summarized what I had heard from participants up to that point and asked if there was anything I missed or anything else that participants would like to add. Lynn offered another benefit of CBD: she has found that having a list of outcomes in the form of EPAs encouraged her to seek out experiences she may not have been encouraged to otherwise. She explained, "There are some very unique experiences that don't come up a lot in Pathology and I found those EPAs prompted me to seek out those experiences." Allison agreed, noting that she thought an Anatomical Pathology EPA which requires a resident to learn about how their reports are used by other clinicians is beneficial to her learning and may not have been covered without a mandated EPA.

Dawn had a last question about the validity of CBD, wondering if there was evidence that the framework was benefitting learners, noting that it "feels like an involuntary experiment." This notion was met with general agreement of the group. Andre's last comment was regarding the change in exam timing – moving the first half of it from the final year of training in PGY5 to PGY4. He felt this shift was unfair to learners. Allison echoed this feeling, noting that the change in exam timing has caused her to experience high levels of stress and anxiety, as she would be writing her certification exams as a PGY4 alongside her colleagues in PGY5. Rose had a final

thought about the added volume of work that EPA form completion adds to faculty and residents' administrative workload. Allison added that there is also additional administrative work for educational assistants in order to coordinate the evaluation process behind the scenes.

Focus Group Summary and Next Steps

The focus group provided the opportunity to gain insight into what six Pathology residents experience in a diagnostic-focused, competency-based medical education program. Their shared knowledge and candor allowed for an unfiltered conversation about their time in a competence by design framework mandated by the Royal College. It also proved the opportunity to begin considering how themes in the data may develop. In my researcher notes, I recorded surprise at how much extra workload the CBD framework added to the daily work and academic lives of residents. From feeling as though they had to coach faculty on how to complete EPA forms and provide formal feedback to feeling nervous to be their authentic selves by not asking questions when working with some faculty, there are many instances when the extra layer of evaluation within CBD detracts from learning. I also noted how intense the general frustration with faculty not being consistent with EPA form completion and the stress of completing the certification exam in PGY4.

Moving on to the participant interviews, I wanted to hear more from them individually about how the learner-coaching-faculty-on-EPA-evaluation-completion dynamic affects learners, so I added a question to the interview guide: "In the focus group, we discussed how residents sometimes need to help coach some faculty along when it comes to EPA evaluation completion. Would you say this is empowering or daunting?" I also thought it was important to learn more about how a participant-perceived positive aspect of CBD – how the outcomes-based framework assists in giving clear structure to learning experiences – may help to also shape professional

identity. As such, I added this question: “Also in the focus group, we talked about how EPAs can help give an enhanced structure to rotations, allowing you to know what you ‘should’ accomplish during that time. Do feel like that structure also gives you insight into what being a practicing Pathologist may look like in the healthcare system?”

Participant Interviews

While the focus group was an important first step in learning about participant experiences, I knew that individual interviews would allow a deeper delve into each participant’s perspective and allow a closer look at variances beyond the group discussion. Interviews would also allow for ensuring consistency in the data and mitigating group think. Each participant agreed to an individual interview. To prepare for the interviews, I went through the focus group transcript and made notes for each individual participant, noting main discussion points that they introduced or added to during the group conversation. While I had a semi-structured interview guide for the interviews, I made sure to weave in participant notes to build upon and clarify ideas they brought forth in the focus group. A summary of participant interviews follows.

Background Questions

I began each interview with the same background questions: one to confirm year of residency training and program, and another to confirm if and when participants had prior experience in an outcomes-based program prior to starting residency. We had already discussed this information in the focus group, but I used these initial questions to reiterate the information I had noted from the focus group and to ease the participant into the interview. Since this had been previously covered, there were no surprises in the data collected.

Experiencing CBD as a Pathology Resident

Once we settled into the interview, I asked each participant about their unique learning experiences as a Pathology resident. To open this conversation, I asked participants to tell me about a typical day on a clinical rotation and the type of interactions they have with clinical faculty, with probing questions including: Do you receive informal feedback on a daily basis? Do you receive formal feedback on a daily basis? How would you describe the feedback interactions you have with faculty? Do feedback interactions feel like authoritarian (top-down) or coaching (peer-to-peer) conversations? How do these feedback interactions make you feel empowered or disempowered?

Understandably, the clinical day question was better suited to the participants in their later stages of training, as the PGY1s (Rose, Dawn, and Gordon) hadn't spent as much time on Pathology rotations at the time of the interview. However, the three more senior residents (Lynn, Andre, and Allison) were able to fully answer that question and everyone offered responses regarding feedback interactions. Participants explained that, beginning in PGY2, there are three different types of clinical days depending on the rotation they are assigned to. The first is called "sign out" days where learners are assigned a caseload of slides from patient files to review. They progressively receive more as they move through residency (i.e., half of the case load of a faculty member in PGY2, working up to a full case load over a couple of years). Learners work through the slides on their own, dictating their findings in the hospital's dictation system but not submitting them. Then, later in the day, they go through the cases one-by-one with the Pathologist faculty member who is working that day. The Pathologist will then decide if the dictation reports need to be modified or not before being submitted as a formal report that becomes part of the patient file. The volume of cases that are reviewed changes as a resident

successfully progresses to more senior levels. A Pathologist working with a PGY2 may choose to review all cases with that learner, whereas fewer cases are likely reviewed as a resident moves to their PGY3 and PGY4 years. By PGY5, it is expected that a resident can function as a junior faculty member. The second type of clinical day is “frozen section” days where the resident is paired with a Pathologist and receives tissue samples from operating rooms. The samples need to be processed within about 15 minutes so that a report can be given to the surgical team. In this scenario, a resident works alongside a Pathologist to visually review the specimen, freeze a sample of it, place it on a slide, and then analyze it through a microscope. The third type of clinical day is “autopsy days”. When they are deemed ready, residents undertake the hands-on aspects of retrieving tissue samples during autopsies. They prepare slides for microscope review and generate reports on their findings.

On each of these clinical days, learners often work side-by-side with Pathology faculty and receive what they consider to be real-time coaching and feedback. Participants described these interactions to feel like peer-to-peer learning with constructive coaching conversations. They considered this to be verbal informal feedback they were receiving daily, whereas formal written feedback via EPA evaluation forms were received a few times a week. Participants noted that EPA completion was faculty-dependent due to varying comfort levels of asking different staff members to complete the forms. Participants felt that they knew which faculty members would be willing to complete an EPA form and which would not be as willing. They also had an idea of who would actually complete a form versus those who would let the form sit in their queue for up to 2 months and then fill it out, potentially not remembering the context of the teaching encounter. They learned this both first-hand through their experiences with faculty and through conversations with other learners in the program. When asked about the dichotomy of

having empowering in-person daily coaching conversations with faculty and then adding a formal layer of EPA evaluations onto those feedback moments, participants noted that it can be an awkward dynamic. Allison noted that:

It feels kind of like you have to compartmentalize them. So, the feedback that you get in real time is definitely the thing that I put more weight into. That's where I'm really doing the bulk of my learning, I think. That formal feedback, the paperwork, feels more like a checkbox exercise, just to prove that I was here, I was doing, and that kind of a thing. But the real learning is happening in real time with the person in front of you, where you can have a dialogue, and ask questions.

Pulling at the thread of empowering interactions with Pathology faculty, I was wondering if those positive experiences may help shape professional identity. As such, I asked the residents if these interactions helped them to reflect on their role within the healthcare environment and with patient care. Unanimously the residents said yes, noting that these interactions help them in contextualizing Pathology's role in the broader healthcare setting by talking through cases and how their diagnostic reports can help shape patient care.

After hearing about how participants perceived a typical day on-service with teaching faculty, I asked them about how, in their opinion, CBD affected their learning on those days. A general sentiment shared with the group was that CBD, specifically EPA form completion, added an administrative layer that was felt to sometimes be a burden to both residents and faculty. Participants expressed that EPA completion added a mental load to their learning, because they had to be aware of what EPAs they still needed to achieve and then align that to what faculty they may be scheduled with and when on their schedule. As Lynn, PGY3, explained:

[When speaking] with the [other Pathology] residents, if you're starting a new rotation and you haven't worked with the specific staff before, if you're just chatting about the rotation, often it comes up, 'Oh, you're working with this staff on Wednesday. Make sure you ask them for lots of EPAs, like, they're happy to fill them out and they'll fill out lots for you.' And then you'll have other staff, they're like, 'Oh, you can send them EPAs, but, you know, it will be months if they... IF they get back to you.'

Even for the junior residents, they noted that figuring out which faculty will be willing to complete EPA forms on their demanding off-service rotations can be difficult to navigate. Rose, PGY1, explained:

A clinical rotation is very busy, like gen surg [General Surgery] or any other ones, are busy ones. The faculty are super busy. They don't have time to see you. They don't have time to talk to you. Kind of a formal CBD form, you kind of push them to interact with you. They have to do this. I feel sorry for them, they have to do this... This generally is a lot of work for them and for us.

Participants also noted that the list of required EPA achievements adds a layer of time management and sometimes stress to their clinical experiences because they had to ensure they make it through the list in order to move on to the next stage of training. Also noted was how the EPA forms are ill-fitting for Pathology, with the narrative entrustment scale not aligning with how the clinical work and learning actually happens in practice. Allison, PGY4, noted that, although the set outcomes provide a clear learning structure, the overall set-up and implementation of the EPAs and the EPA assessment forms in Pathology feels like a "square peg, round hole situation."

Dovetailing from the above sentiments, I asked participants if they found CBD to help or hinder their learning experiences. Gordon, PGY1, noted that he found CBD to be helpful in their off-service rotations because it provided them with clear educational targets to meet while they were away from Pathology and encouraged them to seek out formal feedback. In his words:

Yeah, definitely beforehand [before a rotation begins] you can look at your EPAs, and they sort of give you an idea of what you're expected to do... Off-service, I guess the EPAs are really helpful for you to know what to focus on. I guess you could get lost in what you're supposed to be doing [without the EPAs], especially when you're in a discipline that isn't yours.

Two of the senior residents, Allison and Andre, felt as though the CBD framework (ensuring EPA achievements were recorded via faculty evaluations in particular) hindered their learning. The other senior resident, Lynn, had a more neutral response, noting that it was difficult to know if it helped or hindered learning, because they were unsure of what the learning experience would have been like before CBD. Lynn noted:

Most days it feels like the whole EPA system is a checklist. It's this game that I'm playing in the background and just kind of getting all of these check marks filled, looking for opportunities to get some of these check marks which is maybe actually a good thing. But I don't think that might be a takeaway from the EPA system. That I'm getting better feedback necessarily [because of EPAs].

This benefit of the EPA framework providing learning structure and guidance for educational experiences to seek out was a notion that first arose during the focus group which I asked participants about again in the interviews. Each participant did reinforce this sentiment, considering it a positive aspect of CBD.

Building on this perceived positive aspect of CBD, I asked participants what an ideal learner experience in CBD would look like. Dawn, PGY1, and Andre, PGY3, noted that it would be ideal to lessen the stress of the “time crunch” to achieve EPAs, with Andre suggesting that there be less off-service rotations in PGY1 so residents could dedicate more time to learning their Pathology content. Dawn suggested that the total number of required EPA achievements be reduced to a more tangible number that would not overwhelm learners in the program. Rose, PGY1, and Lynn, PGY3, suggested that fewer assessments would be ideal with a focus shifting back to summative assessments, reducing the formative assessment burden for both residents and faculty. Allison noted that clarity of expectations for learning experiences would be ideal, explaining:

So, to me, the ideal thing would be, they tell me at the beginning, ‘You need to do x, y, and z while you’re on this rotation.’ And I’m like, ‘Great, how do I do x, y, and z?’ And they’re like, ‘Do this, and this, and this.’ So, I’m like, ‘Okay.’ So, then I know, okay, x, y, and z are my EPAs that I need to get done, and everyone that needs to do the EPAs for me, knows what I need to do. Which isn’t the case right now.

This interest in shared knowledge and clarity of expectations was identified by Lynn as well, who shared that it would be ideal to have EPA evaluation forms that allowed for less evaluator subjectivity and which were better suited for Pathology. She explained that much of their Pathology work is objective by nature so having an assessment scale that allows for subjectivity doesn’t make sense. This sentiment was shared by other participants in their interviews as well. Lastly, Gordon, PGY1, shared that an ideal learning situation for him would be that, at the beginning of a clinical rotation, a set outline of EPAs to be covered on that rotation be shared with himself and with faculty and the other healthcare professionals he works with. In his words:

So, to me, the ideal thing would be, they tell me at the beginning, 'You need to do x, y, and z while you're on this rotation.' And I'm like, 'Great, how do I do x, y, and z?' And they're like, 'Do this, and this, and this.' So, I'm like, 'Okay.' So, then I know, okay, x, y, and z are my EPAs that I need to get done, and everyone that needs to do the EPAs for me, knows what I need to do, which isn't the case right now. So, then I can go to the gross room and be like, 'I need x, y, and z.' And so, when x, y, and z come into that part of the lab, they can set it aside for me. And then, when I do them, I can do the reports on them as well. So, that'd be nice, if people were aware that I want to do x, y, and z, and they set it aside, and then I could get those done.

This communication between various members of the Pathology team would take the onus off the learners to constantly seek out opportunities to fulfill EPA requirements and share agency with the other members of the healthcare team.

Last on my planned interview guide was a devil's advocate question posing, "Some would say that the CBD approach can be cumbersome and aspects of it (like milestones and effective evaluation) are easily misunderstood. Would you agree?" However, given the opinions voiced about the EPA evaluation framework within CBD I didn't feel like this question was necessary and it would be redundant to ask. Instead, throughout the interviews, I asked participants about CBD materials and/or orientation sessions they may have received from their program and/or the Pathology department. All participants voiced appreciate for the programs' quick reference cards but did not remember receiving anything further from the department or the Royal College. The junior residents, Dawn, Gordon, and Rose, recalled a CBD orientation session with their Program Director and other PGY1s at the beginning of the academic year, but

explained that it was more about the “logistics” of EPA completion and did not provide details about the purpose of CBD. Dawn remembered:

I think we had a session just kind of talking about what our EPA goals were, and a little handout of, this is the roadmap that you’re supposed to follow. But even then, it was very much catered to our first year, and just given a kind of handout, but never really a big talk about why CBD, what is the goal at the end, what are your expectations at the end.

Gordon expressed a similar perception of the session: “I don’t think they [the Program Directors] really talked too much about the purpose [of CBD], if I’m being honest. They definitely talked a lot about the logistics of how it works.”

The senior residents, Andre, Allison, and Lynn, could not exactly recall when and if there was a program-specific orientation session focusing on the CBD framework. Allison, in her PGY4 year, explained:

I think that the actual information was probably lacking. I think the idea of why we were doing it, or why it was shifting, was made, maybe not clear, but at least there was an attempt to make that known. But the actual intent of it and the outcomes that were expected, and how that was actually going to get implemented, that was—that was definitely lacking.

In my journaling notes, I recorded that this idea of program sessions to orient learners to CBD only offering information on the “logistics” of EPA completion may play a role in learners seeing the EPAs and the CBD curriculum as a checklist exercise.

Individual Participant Nuances

In addition to the standard questions I asked each participant, I also brought forth nuances for each participant based on comments they made in the focus group. This allowed me to further

explore participants' ideas and gain deeper insight into their experiences. Ahead of each interview I reviewed the focus group transcript and prepared participant-specific questions to weave into the individual interviews. Below is a summary of these added conversations.

Andre's interview. In the focus group, Andre, in his PGY3 year, had expressed concern about the exam timing changing. In the traditional, time-based model of residency education both parts of the exam were scheduled for late in the final, or PGY5 year, of a program. In CBD, the first part of the exam takes place in late PGY4, with the second half in early PGY5. The intention in moving the exam is that the latter half of PGY5 can then be spent in the "Transition to Practice" stage of training where the learner essentially functions as a junior attending in the department. However, this shift seems to be causing increased stress for learners, as they realize they have a year less to prepare for the certification exam than their counterparts who went through the time-based program before them. In Andre's words:

The exam [timing] is a big thing. And I think, honestly, I know other programs will be struggling with it, but I think General Pathology in particular, I think it's gonna be one of the biggest programs that are gonna struggle with it. Because really the amount like... It's just the amount of knowledge is just crazy. And it's in such a short time.

The other item I wanted to discuss further with Andre was around the program's outcomes, or EPAs, and the structure that he mentioned in the focus group that the EPAs give to learning experiences. I had a note about this comment, wondering if this added structure could help in learners' understanding of professional identity and how pathology fits into the broader healthcare environment. When I asked Andre about this he said that, although the EPAs do give added structure and can help with how a Pathologist fits into the broader picture, ultimately he

found his daily interactions with his learner peers and Pathology faculty to be the most impactful for professional identity formation.

Lynn's interview. Something that Lynn, PGY3, had mentioned in the focus group was how, in the CBD framework, having a list of EPAs that must be achieved adds an extra administrative layer to the educational program. And that at times it feels as though the EPAs are more about checking items off a list and less about the feedback garnered on the forms. When I asked her to comment on this further, she explained:

I, definitely, most days feel like the whole EPA system is a checklist. It's this game that I'm playing in the background and just kind of getting all of these check marks filled. Umm... Looking for opportunities to get some of these check marks, which is maybe actually a good thing, but I don't think that a takeaway from the EPA system is that I'm getting better feedback necessarily.

Another idea that Lynn expressed during the focus group was that having the EPA framework sometimes guided her to seek out unique experiences because of their inclusion on the EPA list. In the interview, I asked Lynn to give me an example of how this looks in practice. She told me about a scenario where specimens need to be processed differently upon arrival at the lab, for which there is an EPA. Typically, at her training site, this processing would be completed by a laboratory assistant but, in a smaller community, would have to be completed by the community Pathologist. Having the EPA on her list encouraged her to seek out opportunities to undertake unique specimen processing.

These two ideas struck an interesting dichotomy: Having a list of EPAs to achieve can provide an opportunity to enhance educational experiences. But, on the other hand, having to

keep track of EPA completion, ask faculty to complete EPA assessment forms, and ensure you check required EPA achievements from a list is a perceived educational burden.

Allison's interview. In the focus group, Allison, PGY4, noted how a lack of recognition for her prior experience working as a laboratory technician was a frustrating experience. I had noted that this was important to follow-up on in the interview. When asked to elaborate on this, Allison explained:

It's kind of strange because I feel like that [my prior experience] was something that was valued a lot when I applied. That was something that's valued a lot, if you talk to somebody from the medical staff side of things, but it's never translated through as to a, 'You have a body of knowledge that's allowing you to do this work, that I don't have to teach as much, or I don't have to micromanage, or whatever it is, as much'. And I really do... Think that the root of all that, is that there's a lack of understanding from the medical staff of what the technical staff actually do. What is their job, and how do they do it? Because you know, the big part of the medical lab science program that I did, especially so, because you can train as a technician, and you can do a technical school, or you could train as a technologist. And I guess, it sort of changes where you're going, depending on what school you're in. But because I did my medical laboratory technology as part of a BSc, the focus was a lot on the physiology, and the principles of everything. And if you can understand the principles, it doesn't matter what you're working with because you can figure out where all the things can go wrong [in the lab].

She went on to explain that she had believed that her past experience was something very valuable that she brought to her resident role, but she often found herself downplaying it to make it easier to fit into the "regular" operation of the lab with the healthcare team.

Another item I had noted to follow-up with Allison on was her concern about the timing of the exam. Like Andre, she had expressed concern about the certification exam moving from late in PGY5 to late PGY4 and early PGY5. She had shared in the focus group that the exam timing was a major stressor in her life. In the interview, I asked her to expand on this and to tell me about how the exam timing affected her learning. In her words:

Yeah, so I think that this year, having the exam this year has actually certainly made me less motivated to do some of the service work, and some of the learning that goes along with that service work. Because there're only so many hours in the day, and if I can cut down how much service work I'm doing to focus more on the areas of study that I haven't had as much experience or comfort with, then I'm going to. Because ultimately, you know, past your exam you don't really move forward after the residency anyway.

You just have to try to do it all over again. So, I think that impact, the most obvious and glaring one, has been that I have been reticent to engage in some of those opportunities, where I don't need to. I think that that's unfortunate.

She also detailed how she was feeling a great deal of anxiety and overwhelm leading up to the first half of the exam, which was impacting her personal life and mental health.

Dawn's interview. When I met with Dawn she was on the last off-service rotation of her PGY1 year. So, although she didn't feel like she had the full context of how CBD operated in the Pathology department, she was experiencing how CBD was for a learner in other departments first-hand. In the focus group, she had expressed concern about the number of off-service rotations required in the "Transition to Discipline" stage of training (nine months) since there was only one EPA required to achieve during this time. She had shared that at times she felt like she was in an "involuntary experiment" which I was interested in hearing more about in the

interview. When asked about this comment, Dawn noted that she didn't recall directly saying that but that it did resonate with her. She explained:

It's just a bit hard because it's like you're going through this nine months off-service, doing things that are not really super focused to making you a better pathologist necessarily. And I feel like whenever I tried to kind of ask questions around, like, so what are my learning expectations at the end of this, it's always kind of ambiguous. It's never been like a clear, these are your objectives that you should obtain at the end of—even like the specific off-service rotation. So, like gen surg [General Surgery], it would be nice to be like, 'Oh, well you should go into the OR at least X number of times, and see a specimen being taken out.' Whereas, there was no guideline like that, so kind of when you show up on these rotations you're kind of just treated like a blank canvas of a resident, and you're there doing floor work. Which is fine, but it's not really, like I don't really understand what I'm gaining as an entrustable professional activity [EPA] as it is.

I had made a note about her frustration and wondered when too much learner agency in these types of programs (i.e., learners being left on their own to figure different rotation expectations) can hinder educational experiences.

Rose's interview. When I interviewed Rose, she was a PGY1 and had just finished her off-service rotations. She was happy to be back to the Pathology department and was learning more about what interactions were like with Pathology faculty. In the focus group, Rose had expressed concern about the administrative burden that the extra evaluation forms for EPAs creates for learners and faculty. I asked her to tell me more about this in the interview. She explained:

I think our program promotes EPAs, promotes CBD, so we are in a way better situation than Allison. They were at the start. Nobody knows [how CBD works]; nobody wants to do that. And now, they [faculty] are kind of forced to do that [complete EPA evaluation forms]; they are educated to do that. But from a learner perspective, I have to keep counting how many EPAs I still lack. I need to make up my mind, I need to do which EPA today. Still burdensome, I can say that.

When asked if she perceives CBD as an overall help or hinderance to learning, Rose responded, “Not a hinder to my learning, just some extra work, and busier work.” We did go on to discuss how, despite the extra busy work that EPA evaluations add to her educational responsibilities, that she also found having a list of outcomes like EPAs did help give structure to her learning.

Gordon’s interview. Like Rose, when I interviewed Gordon he had recently completed his off-service rotations and was enjoying spending his clinical days back in Pathology. In the focus group, Gordon had mentioned how he found it difficult to gauge how he was doing on his off-service rotations because non-Pathology faculty weren’t aware of the level at which he needed to perform in order to pass his Pathology EPAs. In the interview, Gordon explained:

I guess that’s a bit of a weird thing with the CBD program because our program only cares if we’re able to do very basic clinical things at like a four or five level [on the evaluation scale], which is what the EPAs are graded at. But then, the other programs can have trouble understanding, because they don’t grade their residents like they would grade an off-service Pathology resident.

Thinking about this variance in educational experience, I asked if this had improved now that he was on his Pathology rotations. Gordon explained that the work in Pathology was very different than on his off-service rotations but that “the EPAs are still good and bad. I mean, they’re good

in that, it kind of gives you direction.” He then continued to relay an example of how the EPAs can be detrimental to learner progression if a resident has a hard time getting enough “passing” EPAs (evaluations rated at a four or five out of five).

Participant Interview Summary

The participant interviews allowed for rich discussions about the participants’ learning experiences and opinions. I was able to construct a narrative and gain a deeper understanding on what it may be like to be a learner in a Pathology program that has transitioned to a competency-based medical education framework. This understanding, coupled with the insight gained from my professional medical education experience, the documents reviewed, and focus group provide a solid footing for my study’s thematic analysis.

Reflexive Thematic Analysis

As outlined in the Methodology chapter, reflexive thematic analysis (Braun & Clarke, 2006, 2013, 2019; Byrne, 2022; Campbell et al., 2021) was used to analyze this study’s data. Enacting the steps of reflexive thematic analysis for qualitative health research (Campbell et al., 2021), I explored the analytic phases of data familiarization, initial code generation, generating initial themes, theme review, and defining and naming themes in chapter 3. A continuation of the thematic analysis continues below with an analytic narrative which describes the data’s themes.

Creating an Analytical Narrative

We are all part of the same rainbow. We are all reflections of each other. As unique and diverse as we are in character and skills, the source of all creation is as multidimensional as we are.
- Suzy Kassem

The rainbow shows us how bands of colour can stack on one another to make a complete scene. In my research, this is much like how the data formed bands of themes which came together to elucidate the case study in question, providing a picture of the learner experience in

competency-based Pathology programs. And, similar to a rainbow, sometimes the colours overlap and land in two themes, and sometimes they overlap to create nuanced colours.

Much like the rainbow's bands, I found my themes blending into each other, with some feeling smaller like an inner band, and one feeling like a bigger, overarching theme encompassing the rest. My interpretation of these themes follows with a construction of this study's rainbow, starting from the inner bands of descriptive themes and moving outward to the overarching interpretive theme.

Theme 1: The benefits of an outcomes-based approach to professional education

As evidenced in the focus group and interviews, each participant agreed that having transparent outcomes for training experiences was a benefit to clarifying expectations of them as a learner. This benefit of clear learning expectations is also an item noted by the Royal College in their CBD documents. Other benefits noted by participants include residents being challenged to take on more complex cases than they would have without the motivation of EPA completion, and enhanced reflection and professional identity development. Although the College does not mention reflection and professional identity development in their CBD documents, they do note that residents having more control of their learning is an expected benefit of CBD which aligns with resident motivation to attempt complex cases.

These benefits first surfaced in the focus group with a general consensus among the more senior residents that having the added structure of expected outcomes motivated them to explore a breadth of complex clinical cases they may not have necessarily sought out otherwise. Building upon this notion in the individual interviews, I asked individual participants if this rang true to them and, if so, to share an example of this. Andre shared that, in conversation with a non-CBD

resident, he found out that he was undertaking cases that the other resident had rarely done. He noted that:

[having set EPAs] does kind of motivate me, I guess, to do certain things. I mean, I recall that... I was grossing a specimen and I was speaking with one of the more seniors who is not in the CBD program and they were like, 'Oh, I've never actually come across the specimen before' or something like 'I have only grossed it once' and I have grossed it several times. So I'm wondering, maybe because of CBD that I had that specific category of specimen to do...I actually reached out and did it, and otherwise I would have not. I would have not actually reached out for these opportunities.

This sentiment was shared by Lynn, who acknowledged a time when she was able to go out of her way to arrange a learning experience that she wouldn't had been driven to was it not for having an assigned EPA. Here is how she described that situation:

One of the ones that comes to mind is dealing with specimens that come in fresh and then you have to allot them for certain types of tests. ...So usually when specimens come in, they come in in formalin and that's just the way that everybody's used to dealing with them. But there are special circumstances where you'll have to take a bit of tissue and you'll have to freeze it or you'll have to put it in a different type of medium. And it just gets processed differently. But a lot of that work is done by our pathology assistants who are people that work in the lab that do a lot of grossing. But if you work in the community as a Pathologist, you might be expected to, well, you should know all of these things, but you might be expected to also do them. And a lot of this stuff gets done either after hours or it's just done really quickly. So, then there's just really no point to get residents involved. But then if you're out on your own practicing and you've never

actually done it yourself. Then it could be a problem. So that's one of our EPAs, just dealing with fresh tissue... A couple months ago I was on my [hospital name] rotation and I said to one of the pathologist assistants, 'You know, this is one of my EPAs. Can you call me every time you have fresh tissue?' And I managed to see a lot of specimens that maybe I wouldn't have otherwise. And I managed to get those EPAs as well.

So, in practice, it does appear that residents appreciate the extra push that an outcomes-based approach affords to experiencing learning opportunities they may not have had the opportunity to experience in a non-OBE environment.

Furthermore, when asked if having a specialty-specific list of outcomes helped them to know what it means to be a Pathologist, all three of the more senior resident participants in their interviews affirmed that it did indeed help them cultivate their professional identity due to the scope of what they were expected to see and do in order to accomplish. Specifically, Allison and Lynn both noted that the EPAs, including mandated resident participation at multi-disciplinary tumour board rounds, were especially helpful to their understanding of how a Pathologist fits into the healthcare system. Allison summed this experience up by noting that, "Being able to consult on, and see how that interaction works, and have a bit of an understanding of where that report goes" was helpful to her understanding in how a Pathologist interacts with their colleagues in other clinical departments.

The benefits of clear, structured objectives and of cultivating professional identity in outcomes-based professional education programs are discussed further in chapter 6.

Theme 2: Identifying a gap – Prior skills and mandated objectives

Adult learners enter their professional medical education programs from diverse backgrounds. Although they must complete a four-year medical school degree before applying

for residency training programs, what they do before and during medical school will vary. Initially a cornerstone of competency-based medical education, the striation of learners completing residency programs at their own pace was done away with the hybrid time and outcomes-based model of CBD. So, although learners may bring different skillsets to their outcomes-based residency training program, this prior learning and current level of competence is not taken into consideration. Learners must still move through a pre-designated series of clinical rotations over a five-year period regardless of aptitude or speed of EPA completion. This has proven to be frustrating for learners.

In terms of prior skills, Allison explained that having completed a laboratory technician program prior to residency, she understood the nuances of working in a Pathology lab very differently than someone who didn't have the same background. She noted that:

From my understanding in other CBD kind-of based learning, is that part of it is to be able to take your previous experiences and say, 'Hey, look, you don't necessarily need to do as much because you're actually pretty much confident in whatever this portion of your new job is. So, let's focus on the thing that you haven't done before.' And so, my understanding was that that previous experience is going to make it easier to focus on the things that I need to experience. But that definitely doesn't happen, and moreover, I think the education that's come a little bit from the college... and then probably mostly from our program... Their interpretation of what the college is recommending, has turned into a very prescriptive—you must show progression, therefore, if they've done it the first time, you can't pass them on it, even if you think that they're competent in whatever it is. Even if you wouldn't have done anything differently, you can't pass them because it's their first time. And to me, that's not the spirit of CBD. But I feel like that's just a

misinterpretation, or maybe I'm misinterpreting, but my understanding was not that that's how CBD was supposed to work.

Similarly, the PGY1s in the study found it frustrating that they were required to complete a number of rotations in other specialty departments outside of Pathology in their first year of training, feeling the training experiences were redundant especially since there was a small number of EPAs to fulfill given that they are required to spend six to nine months in allotted off-service time. They discussed this primarily in the focus group where there was discussion around feeling like they were involuntary participants in a new curriculum where they were sold the promise of being able to progress through their training program based on their individual merits, finding it frustrating when this isn't the case. Dawn summarized this notion well in the focus group:

And so, you know, if it was initially sold as like, oh you finished your competency, you're competent, you can move the full way up... [participants laugh] Now I'm still doing... Whatever the leftover months are, and I'm not really sure why. Well, I know why, because I have to get my ITERs. But I'm like, in the logical scheme, I'm not sure why.

This sentiment showcases an opportunity for outcomes-based programs to actually take the prior experiences of learners into consideration when devising assessment and progression plans. This notion of prior learning assessment in outcomes-based education is explored further in chapter 6.

Theme 3: Balancing agency – When is empowering learners a hindrance to learning?

A notable theme expressed by participants was how managing their EPA completion added an extra layer of work to theirs and their faculty preceptors' day. CBD has been touted as a learner-centered framework by the Royal College, giving residents control over when they

challenge an assigned outcome and over who will complete the accompanying EPA form. However, in practice, learners feel as though the CBD curriculum is primarily another administrative task that they must accomplish. As Andre shared in the focus group:

Well, there's still a discrepancy between what we need to achieve and what we're actually doing with the time. So, the whole structure and the whole scheduling still remains similar, relatively similar, to what it was before, but then there's all these extra... Refinements.

To which Allison added “Yeah. And the paperwork” and Andre agreed. Further elucidating this point, in the focus group Lynn shared that, ultimately, completing EPAs mandated in CBD doesn't change the way that residents learn or faculty teach, “But that doesn't actually translate into any difference in how residents are working, then what's the point. Like, it just seems like this is all fake.” This discrepancy between what actually happens in practice and what is expected in the CBD curriculum, on top of the extra administrative tasks it adds to a resident and faculty members' mental load is a barrier to CBD being embraced by residents and faculty alike.

In theory, collecting more frequent, low stakes assessments in CBD would allow for enhanced feedback and coaching opportunities. However, in diagnostic-focused specialties such as Pathology, learners spend much of their day sitting side by side clinical faculty receiving real time feedback on their clinical learning. Because of this dynamic, participants expressed that it can sometimes be awkward to then ask a faculty member to complete an EPA form after a verbal feedback or coaching interaction has taken place. Participants explained that, since EPA form completion can feel like an administrative burden to them as a resident, they sometimes feel uncomfortable in putting that burden onto a faculty member by asking them to complete a form. As Rose explained in her interview:

...but people are so busy. Let's say, you are a pathologist, you receive an EPA today. You have so many students, how can they remember all this to do? It's hard, and they have piles of work to do. Workload is so high. Yeah, so sometimes it's burdensome.

She went on to describe the extra work in keeping track of EPAs from a resident perspective as well, noting that:

But from a learner perspective, I have to keep counting how many EPAs I still lack. I need to make up my mind, I need to up the EPA today. I definitely need to get some in two weeks. Still burdensome, I can say that.

This sentiment of an extra ongoing mental load of tracing EPA completion was shared by the participant group.

Overall, the data demonstrates a disconnect between empowering learners to have ownership of their learning experiences and giving them too much agency over proving their outcome completion to the point of it being a hindrance to their learning. I explore this imbalance from an adult education perspective in the following chapter.

Theme 4: Community of practice as a critical support

Interestingly, participants repeatedly expressed how they acquired knowledge about opportune times to fulfill EPAs, what faculty members may be more open to completing EPA forms in a timely manner, and general support (and sometimes commiseration) from their resident peer group. As Rose explains, "...we get information from the fellow residents, definitely, specifically about who likes to do EPAs, who doesn't like to do EPAs, very specific questions for very specific situations." Dawn, also in her first year of residency, felt similarly about having the opportunity to discuss CBD-related items with more senior residents, noting that she would seek out their advice on EPA completion if she has difficulty in getting her EPA

forms back from faculty as she progresses through the program. Interestingly, from a senior resident perspective, Allison explained how she and her senior resident colleagues sometimes take on an informal mentoring role for junior residents when it comes to the juniors navigating EPA completion:

Sometimes I think that they [junior residents] are coming even to say, 'Is it worth trying, or should I wait for a different interaction for an EPA?' Which I think is too bad. I think that is an unintentional effect of this whole kind of foray into a different teaching method, so to speak... I think I've gotten it more and more as the years have gone by. I think that generally the intent is just to make sure that the kinds of information that somebody is learning is correct, and so that when they do talk, and have those interactions with staff, they're armed with information that is correct... I think that the biggest thing has been somebody saying, 'You know, I really need X number of EPAs because I'm just falling behind. So, I want to go through this case with you to say, yes, this is what I think this is', and feel just a little bit more comfortable with the conclusions that they have made. Just to have kind of a second opinion before they have to go and tell a staff person, that that was their opinion from the beginning.

In this case, junior residents are leaning on their senior colleagues for encouragement and advice in not only navigating clinical cases and EPAs, but also their interactions with faculty members. This transmission of shared experiences and knowledge are beneficial to both the junior resident as they learn how to navigate CBD in Pathology, but also the senior resident in building their confidence as a mentor in their educational community.

There was also mention of resident group meetings with Program Directors and how the competence by design curriculum tended to take over these meetings with residents asking questions and expressing concerns. Lynn shared an example of this in her interview:

We have program director meetings where all the residents sit with the program directors and we just kind of hash out any problems or anything that we're talking about. And one of our R5s was off site and we said, 'Oh, do you want us to, like, Teams you into this in-person meeting? And he said, 'No, I feel like these are just EPA rant sessions now.'

Other participants shared a similar feeling about the group meetings, noting that they were a welcome opportunity to voice concerns and have regular check-ins with the Program Directors.

Lastly, all participants expressed the appreciation and utility of the quick reference cards developed by the program. They noted that these documents were helpful in informing their understanding of required EPAs and in keeping their efforts to seek out and achieve EPAs organized. These documents are an excellent tool to promote shared meanings within the group.

This community of practice within the resident group proved critical to learners feeling supported and part of a group of people experiencing the same thing at the same time. The junior residents were relieved to have a group of more senior residents they could call on for support. And the senior residents were happy to be able to discuss their experiences with their peers and have regular access to the Program Directors to voice their concerns. The importance of cultivating a supportive community of practice within professional programs is discussed further in chapter 6.

Theme 5: Objectives-based education and the importance of faculty and learner understanding the same things at the same time (shared meanings and rules)

Dovetailing from the section above, the participants expressed concern around how they perceived the rules and contextual meanings of EPA assessments and scales on the forms, versus how faculty perceived them. In the focus group, Allison explained that:

In our department, we don't necessarily have the as clear cut, like you have to be PGY- whatever in order to get your passing EPA. But you do have this artificial understanding. And I think it's because it's been talked about a lot, but the understanding of the staff is that there should be able to show progression. So that staff will go and do an EPA for you and say, 'Well, this is the first time I've seen you do it so I can't pass you on it because I've never seen you do it before.' So that's also difficult. So now you can see like myself, I'm PGY4. In theory, writing my exam and should be competent to do a number of things. And they say, well, I've not seen you do it before so I'm gonna have to give you a non-passing EPA. But so again there's another layer of disconnect as to why. What is the point of the EPA then?

The participants went on to note that some faculty understanding was different than what they had been told, noting a particular section of the department's faculty began scoring resident performance differently after a section meeting. In the focus group Lynn explained:

I think there is a certain department within our department... That there must have been some meeting, like, explaining CBD because I had a staff say exactly the same thing. And it was 'Oh no, we were just, you know, we just had this whole thing about CBD. And the whole point is that you're going to have to show progression.' So, I'm on this rotation for a month and I need 10 passing EPAs but if I work with a different staff each day and

evening and I need to show progression, then there's no way that I can get these EPAs. And it's so artificial... Like they literally said, 'Oh, you did a really, really great job on this case' and she's like, 'Can I give you a four? Like, is that OK?' And I was like, 'Yes. Yes, it is.' I was like... 'I got plenty of threes. We are okay.' So I think that... they're trying to prove that CME works. But if that doesn't actually translate into any difference in how residents are working, then what's the point. Like, it just seems like this is all fake.

Understandably, this was not only frustrating for participants but also seemed to negate the overall intended purpose of the CBD curriculum with residents noting that there was misalignment with in-person feedback interactions with faculty and how that feedback was reflected on the formal EPA form.

The importance of learners and faculty understanding the same rules and meanings of a mandated outcomes-based curriculum cannot be understated. Without this alignment, learners become frustrated and apathetic about the curriculum framework and teachers become uncertain of how to properly assess learners. A shared community of practice of all parties impacted by the same outcomes-based curriculum would be ideal and recommended from an adult education perspective which will be further explored in the next chapter.

Theme 6: The thread throughout - Necessity of a shared understanding

Throughout the defining and naming themes phase of my reflexive thematic analysis, an underlying thread that endured was the necessity of a shared understanding. Whether a shared understanding of the resident and the faculty of a clinical rotation, a shared knowledge amongst residents of EPA expectations, or a shared interpretation amongst faculty and their colleagues of how to teach and coach residents in a CBD environment, the importance of everyone being on

the same page at the same time is paramount to ensuring an optimal learning environment that not only cultivates professional education but can also support the requirements of an outcomes-based education framework. Otherwise, instead of a rainbow's organized banded arch of colours, everyone's unique understandings and perceptions can create a scattering of colours, causing confusion and disengagement which negates potential intended benefits of the curriculum approach.

As described by Allison in the focus group, the understanding of what warrants various scoring on EPA evaluation forms can vary between faculty members. Allison shared that:

I've definitely had the experience where I've done a case, we've come to a conclusion, staff and myself, and it's kind of the same conclusion. But staff has said, 'I think I need so and so to review this because that I'm not as good at whatever organ system'. So, you do and then you come back to the table and they say, 'Let's do an EPA for this'. You're like, 'OK, that sounds fine'. And then [on the EPA form] they say, 'I needed to prompt. This was a difficult case. You weren't able to work it through.' But they also couldn't work it through.

This garnered a chuckle from her colleagues to which Allison continued, "So... you see where the disconnect is. So I'm like, well, 'If you couldn't work it through and I can't work it through... Does that mean that I'm incompetent, are you incompetent or are we both just...?' Yeah." Her colleagues agreed, with Andre noting that he had a similar experience in the past with a faculty member as well. This continued with Gordon noting that on his first-year off-service rotations he found that different department's faculty approached EPA form completion differently, with some confusion existing on how to "score" a PGY1.

Reflecting on this exchange, I realized that there was faculty and resident confusion not only locally in the Pathology department but also present in various departments throughout the university. With all of these variances in understanding, it is easy to imagine how partakers in CBD can quickly become disenfranchised with the curriculum approach and put very little value on the EPA assessment forms which are a cornerstone to residents progressing through the CBD curriculum. In order for a competency-based medical education framework to actually be a learner-centered curriculum that benefits the resident as it is intended to do, then the assessors and residents across an institution need to have a shared understanding of how it all works. Without this, CBD is reduced to just another administrative to-do with little value to the learner.

However, a broadly shared understanding of the above-noted themes could help in changing perspectives. In other words, if the actual learner-perceived benefits of an outcomes-based approach could be presented as a positive message to parties involved, learners' prior skills and training were understood and taken into consideration at the beginning of their program, learners were empowered but not so much that it hinders their capacity to learn, communities of practice were cultivated to support learners and faculty shared meanings, and a broad common understanding of framework elements could all exist simultaneously then an outcomes-based educational curriculum would likely proceed as more of an organized rather than confused polychromatic system.

Chapter Summary

In this chapter, I presented my study's participants and their stories as organized into a colorful spectrum of five semantic and one overarching latent theme. By using reflexive thematic analysis, I was able to use my unique positionality to address my research question and provide insight on what it is like to be a learner in a diagnostic-focused Canadian residency training

program that has introduced a competency-based medical education (CBME) curriculum approach. Aligning with my research objectives, these participant experiences and their impact on professional outcomes-based education programs and learner-centered adult education is explored further in the last section of this dissertation, Chapter 6: Discussion.

Chapter 6: Discussion

At the outset of my doctoral journey, I was a medical education administrator tasked with reconciling the introduction of a new outcomes-based education framework with what I believed was best for learners, largely based on recent academic work in a Master of Education in Lifelong Learning program. A mandated curriculum change was being launched and, search as I may, I was unable to find literature which included the learner voice in the broader conversation. Feeling frustrated, concerned, and curious, I knew I wanted to delve deeply into the experiences of learners in competency-based medical education (CBME) programs in my doctoral work. I felt passionately about weaving together my professional experience in medical education with my academic experience in adult education in order to uncover untold stories and bring to light what it was like to be a medical resident in an outcomes-based program. Taking this notion one step further, I realized that not only were learners largely being omitted from the CBME conversation, but learners in diagnostic-focused specialties were even less represented in the messaging, development materials, and evaluation forms (Clarke et al., 2019). As such, my research study was developed to answer the question “What are the experiences of learners in a diagnostic-focused Canadian residency training program that has introduced a competency-based medical education (CBME) curriculum approach?” The study’s aim was to inform professional education programs by giving voice to the learner experience within programs that have a mandated outcomes-based curriculum (in this case, in the form of CBME) and to provide insight into learner-centered education in this context from an adult education perspective.

In this chapter, I explore how the research study answered the proposed question and fulfilled the study’s objectives from an adult education perspective. I also discuss the implications this research has for professional and medical education theory and practice, the limitations of the study, and potential research directions.

Discussion of Findings

Following approval from the StFX Research Ethics Board, I was nervous yet eager to begin participant recruitment. I remember a racing heartbeat and a feeling of uncertainty when sending the initial invitation email and the excitement when the responses began to arrive in my inbox. After a couple of follow-up emails, I had six participants enrolled and a focus group scheduled (with individual participant interviews scheduled thereafter). Using a purposeful, homogenous sampling method (Suri, 2011), my participants were all current learners in Pathology programs in the same clinical department from the same university, ranging from their first year of study to their fourth year of study in their five-year program. Hoping that I could build trust and rapport with participants by being an external insider (Fletcher, 2019), I was glad when the participants eagerly shared their stories and accounts of their experiences with me. They expressed a desire to share their experiences because they felt that the competency-based education program they were part of did not meet their expectations and could be improved to better support learners. As discussed in chapter 5, their experiences wove together narratives which informed five descriptive themes: the benefits of an outcomes-based approach to professional education; identifying a gap: prior skills and mandated objectives; balancing agency: when is empowering learners a hindrance to learning; community of practice as a critical support; and objectives-based education and the importance of faculty and learners understanding the same things at the same time (shared meanings and rules). There was one overarching interpretive theme identified which provided a common thread throughout the data: The necessity of a shared understanding throughout the curriculum with all stakeholders (learners, educators, faculty leaders, administrators, other members of the healthcare team, and so on). In this section I discuss the intersection of these findings with the information I presented regarding outcomes-based education (OBE), competency-based medical education (CBME), and

adult education theory in Chapter 2. I then offer potential implications for theory and practice, outlining how the study's findings contribute to existing theories and propose new theoretical insights. The practical implications for the design and implementation of OBE and CBME programs are also explored, with recommendations for educators and policymakers. Lastly, the limitations of the study and future research directions are explored. But first, an exploration of connecting the study's relevant theory to its themes.

Connecting Theory to Themes: Andragogy Aims and Program Pitfalls

The first and most apparent connection between theory and themes, or perhaps more fittingly categorized as a disconnect, is the gap between learner expectations of what an outcomes-based or competency-based program *should* present as and how it operates in reality. Although presented in the literature as being learner-centered and a benefit to educational outcomes for professional programs (Frank & Danoff, 2007; Frank et al., 2010; Holmboe et al., 2017), it was clear in discussing perceptions of competency-based medical education (CBME) programs with participants that it was not what they had expected. Participants had anticipated entering a program where they could progress at their own pace and potentially finish their residency training early if they met all mandated outcomes. However, after entering the program, it became apparent that they would still need to complete five clinical training years in the program regardless at the pace in which they achieved program's outcomes (in this case the program's outcomes are dubbed "Entrustable Professional Activities" or EPAs).

This confusion can be traced back to the first conception of competency-based medical education where the initial intent was for learners who exceeded expectation and achieved EPAs ahead of their peers to be able to progress through the stages of training and into practice with haste (Holmboe, 2018). I recall this being a feature of focus when CBME was first introduced at

the Royal College of Physicians and Surgeons of Canada's annual International Conference on Residency Education (2015). However, it became quickly apparent that this would not be feasible in practice, as medical residents play an important role in clinical coverage and delivery in Canadian hospitals. As such, the Royal College created a hybrid model of CBME called "competence by design" or CBD which incorporates time-based and outcomes-based learning. Unfortunately, this shift in design was not made completely clear to the participants in my study before they entered their residency training program, and they were disappointed to learn that they would not have the opportunity to progress at their own pace and were still tied to the 5-year schedule. From an andragogical perspective, such as Daffron and Caffarella's (2021), the success of an outcomes-based program is dependent on a shared understanding of the framework's structure and outcomes by all parties involved. In this case, there was a divide between the learners' expectations and the program's design. This was a missed opportunity from the Royal College and the Pathology programs, as the learners were immediately confused and somewhat discouraged at the outset of their journey to become practicing Pathologists. This speaks clearly to the overarching theme which arose from the data: The necessity of a shared understanding throughout the curriculum with all stakeholders. Had participants been aware that they were entering a CBD program employing a hybrid model of education, their expectations could have been appropriately aligned with program objectives and they may have oriented to the program more quickly. However, through the study's thematic analysis, I learned that participants were still highly motivated to learn and thrive within the parameters of the CBD program. They even noted that there was a benefit to their learning within the outcomes-based approach – A clear map to provide direction of what they should be learning and when. This theme is further explored next.

When Literature and Practice Align: The Benefits of an Outcomes-Based Approach to Professional Education

In chapter 2, I discussed many perceived benefits of an outcomes-based approach to education that can come to fruition in a perfectly executed program under ideal circumstances. However, in practice, there are many nuanced minutiae that affect a program's success. That being said, there was one successful competency-based element which was not only touted as a benefit of outcomes-based education in the literature but also in practice – That having a set of outcomes benefitted learners by providing them with a clear idea of what was required of them and of what they should be focusing on at various stages of their program. The literature notes that in OBE programs, measurable outcomes are established but the ways in which they can be achieved are often flexible and can be negotiated between educators and learners (Daffron & Caffarella, 2021; Merriam & Bierema, 2013). This participatory approach aligns with the principles of constructivist learning theories such as Kolb (2014) and Tuomainen (2023), which emphasize the importance of active engagement and personal relevance in the learning process. This supports participant perspectives of feeling as though they had clarity on where to spend their time focusing while on clinical rotations thanks to the list of EPAs they were given from their Pathology program. They also noted that having EPAs centered on a certain criterion motivated them to seek out novel learning opportunities that they may not have sought out otherwise. The benefit of role clarity coupled with guided skill development was noted by participants as a benefit of CBD.

From an adult education perspective, I was able to take this notion of role clarity and having a depiction of Pathology from a skill-development perspective a step further, asking participants in their interviews if they felt as though having a clear list of Pathology-focused outcomes assisted them in their knowledge of what it means to be a Pathologist and if they

thought it may have supported their professional identity formation. Professional identity formation as described by Jarvis-Selinger et al. (2012) is:

an adaptive, developmental process that happens simultaneously at two levels: (1) at the level of the individual, which involves the psychological development of the person and (2) at the collective level, which involves a socialization of the person into appropriate roles and forms of participation in the community's work. (pp. 1185-1186)

While the question regarding professional identity garnered mixed responses, the notion of a two-pronged development process did surface, affirming Jarvis-Selinger's description. Some participants noted that having a picture of a scope of practice for Pathology did indeed help them envision what being a Pathologist meant within the broader healthcare context (level of the individual). Whereas other participants noted that it wasn't a list of competencies that helped form their professional identity but rather their participation in interprofessional education activities like multidisciplinary rounds and consultations with other healthcare professionals from other clinical departments that were beneficial in the construction of their professional identity (collective level). While studies exist regarding professional identity formation in professional programs (for example, Simmonds et al., 2020; van der Cingel & Brouwer, 2021), and in Undergraduate medical education (for example, Kalet et al., 2017, MacLeod, 2011; Sarraf-Yazdi et al., 2021) there is an opportunity for more research in this area, particularly in the healthcare education fields and Postgraduate medical education programs utilizing OBE curricula. Although the benefit of mandated objectives providing a clear learning path for medical residents was apparent in the participant data, so was the drawback of this mandated framework not taking into consideration the prior learning experiences of its partakers.

A Gap in Benefit: Learners' Prior Skills and OBE's Mandated Objectives

As discussed in chapter 5, there were two participants who entered the Pathology residency program having completed prior education and professional work before their medical degree in similar pathological fields. Particularly for Allison, who worked as a laboratory assistant in a Pathology lab before her medical degree, this was a difficult dichotomy for her to navigate when she entered the Pathology program. She noted that there were a number of introductory EPAs that she was required to achieve even though she had professional experience in those or very similar laboratory tasks. She also expressed frustration in the fact that faculty she was working with felt as though they couldn't give her a "passing" grade (i.e., a 4 or 5 on the EPA assessment scale) because they hadn't worked with her much and felt obligated to show learner progression on EPA reports, only assigning a passing mark on a third or fourth EPA evaluation form. This experience left her second-guessing her performance as a resident and left her wondering if she was doing and saying the "right" things, not wanting to overstep in her new role in the laboratory. As Hill (2020) explains, assessment should consider the unique needs and experiences of adult learners. Adults enter educational settings with a wealth of prior knowledge and experience and assessments should be designed to recognize these differences and meet the diverse needs of learners. Faculty can also use assessments to help learners reflect on their own learning and to develop their self-reflective skills. This speaks to the potential pitfalls of an OBE framework, noted by Barman et al. (2014), where a reductionist approach to education can rely heavily on educational outcomes and lose sight of the holistic needs of the learners in the programs. And how, in practice, OBE may negate individuals' prior learning and experiences, instead emphasizing standardized outcomes which may not account for the diverse educational experiences and backgrounds of learners (Arnold et al., 2020).

To adhere to its learner-centered claims, CBD, in the spirit of an outcomes-based program, could consider incorporating a prior learning assessment component to their programs for learners who enter the programs with a non-traditional background (traditional being a linear path from an Undergraduate degree to a medical doctor degree to a residency program). Prior learning assessments afford the opportunity to acknowledge an individual's informal, formal and non-formal experiences and assist in recognizing the competence and knowledge an individual possesses (Stenlund, 2009). Furthermore, this type of assessment for healthcare professionals aligns with current trends of the provincial governments in Canada now offering prior learning and work assessments for healthcare workers to assist in the credentialing and licensing of qualified professionals from jurisdictions outside of Canada. It would also better align with the principles of learner-centeredness and allow for learners to feel valued in their entirety. This value could also lead to establishing trust with faculty and the program enabling learners to feel safe to experience and engage in elements of experiential and transformative learning. As discussed in chapter 2, the lack of flexibility and individualization in a program with a standard set of outcomes can be a barrier to a learner's success and inhibit them from being able to fully be present to experience transformational learning elements (Illeris, 2014). Allowing for flexibility in acknowledging a learner's prior experiences would also have the benefit of empowering the learner to have a sense of control in a program where there are many rigid structures to follow. This agency, however, must be considered within the broader context of competency-based medical education programs and the other aspects of the framework in which learners have been asked to take the lead. The notion of sharing agency and when this may go too far is investigated next.

Sharing Agency: Can It Be Too Much of a Good Thing?

In chapter 2, I noted that outcomes-based programs encourage a shared agency with learners because learners are encouraged to take an active role in their learning, to set personal goals, and choose learning activities that support their unique interests and needs (Merriam & Bierema, 2013). This idyllic educational setting should be a paradigm that programs strive to meet. And although competence by design (CBD) programs claim to promote this learner centered approach (Harris, 2014; ten Cate & Billett, 2014), the participants in my study felt as though the onus put on them to seek out educational opportunities, organize the collection of formal feedback, and track EPA completion was a hindrance to their education. They noted instances of disappointment when having to coach some faculty members on how to complete an EPA form and letting them know if it was acceptable for them to give them a passing grade on an EPA. They also noted that the administrative burden of managing the checklists of EPAs and tracking EPA completion to ensure assigned quotas of achievements were met was daunting and a distraction from their learning. The problematic nature of quantifying educational outcomes with quotas was also discussed in chapter 2, noting that the emphasis on quantifiable outcomes can lead to a reductionist view of education, where the richness of the learning experience is overshadowed by the pursuit of standardized outcomes. This can devalue important aspects of education, such as critical thinking, creativity, and social development, which are more difficult to quantify (Saroyan, 2022). Lastly, participants noted that, although they were given control of tracking their learning outcomes, they sometimes found it difficult to find opportunities to achieve EPAs targeting lesser-available clinical cases. This was noted as a stressor for some participants and would be an opportunity for programs to provide a structured approach to the completion of these EPAs in a simulation-based or virtual reality-based exercise.

Although this perceived imbalance of agency arose during participant discussions, an unexpected positive element arose from the dissatisfaction. I was somewhat surprised to hear that from these moments of frustration blossomed an opportunity for participants to lean on and learn from their peers in an established community of practice. This invaluable peer support is discussed below.

Supporting and Learning from Each Other: When Learners Benefit from a Community of Practice

As discussed in chapter 2, a community of practice (CoP) is defined as a group of people who share a common interest or passion for a particular field and engage in collective learning through regular interaction (Wenger, 1998). As Gurbutt and Cragg (2019) explain, in higher educational settings, CoPs play a significant role in supporting learners through peer interactions, mentorship, and collaborative learning. And, particularly in educational programs where learners progress through programmatic elements with a cohort of their peers, a community of practice can be invaluable in providing a platform for learners to share their experiences, challenges, and successes. This sharing creates a rich environment where individuals can learn from the diverse experiences and perspectives of their peers (Wenger-Trayner et al., 2020).

This richness of support was apparent in discussions with participants where they noted that they leaned on their peers in the Pathology program for support and knowledge as they navigated how, when, and which faculty were likely to be willing to complete an EPA form. They also used peer learning to assess which clinical rotations they could potentially gain opportunities to complete various EPA achievements on. Notably, the junior residents described seeking this peer guidance from senior residents, and the more senior residents described being an available resource for learners their junior. This informal peer mentorship dynamic also speaks to the importance of CoPs allowing space for guidance from experts and role modeling.

Bottoms and colleagues (2020) explain that CoPs often include experienced practitioners who act as mentors to less experienced members. These mentors provide guidance, advice, and insights that help learners navigate complex challenges and develop expertise. Furthermore, these mentors serve as role models, demonstrating effective practices and professional behaviors that learners can emulate. This modeling helps in shaping learners' professional identities (Pyrko, Dörfler, & Eden, 2019).

It is clear that a peer CoP is an advantage in an outcomes-based program and should be encouraged by the program's membership. For example, in CBD programs, the Program Director and Program Administrator can assist in fostering CoPs by giving residents protected time at academic half days to discuss their experiences. Or, as was the case with the Pathology program this study's participants were members of, programs can schedule regular check-in meetings to discuss EPA completion and ask questions. This led to community building and trust enhancement, as residents heard from their peers about how they were navigating their educational path. Again, this was most impactful for the junior residents, where they noted that it was helpful to hear about challenges and solutions encountered by senior residents in the program. As Wenger et al. (2002) point out, it is this knowledge sharing in CoPs that fosters a culture of collective intelligence and continuous learning. This knowledge sharing is important for problem solving and can lead to the development of innovative practices, as seen in chapter 5 where participants took advantage of learning from their peers' experiences and were able to come up with ways in which to navigate the requirements of their program.

Communities of practice highlight the crucial impact of individuals sharing the same rules and meanings. As I learned in the study, the importance of learners and faculty

understanding the same details about their outcomes-based program at the same time cannot be understated. This notion is discussed in the next section of this chapter.

An Artificial Understanding: The Learner and Faculty Conundrum in OBE Programs

In chapter 2, a review of various outcomes-based education (OBE) elements was presented noting that positive learner outcomes were plausible when OBE programs were organized and implemented seamlessly. However, in practice, there are numerous nuances and minutiae that surface in educational settings and programs that keep OBE curricula (such as competence by design) from being implemented without any challenges, one of them being faculty understanding of all of the various components of the assessment framework (Crawford et al., 2020; Kwan et al., 2020; Ryan et al., 2022). A shared understanding between faculty and learners regarding educational objectives ensures that both parties are working towards the same goals. Educational objectives serve as a roadmap for the learning process, guiding the design of curricula, instructional strategies, and assessments. When faculty and learners have a common understanding of these objectives, it becomes easier to align teaching and learning activities with the desired outcomes. According to Daffron and Caffarella (2021), aligning educational objectives with teaching and assessment practices is fundamental in outcomes-based education, as it helps learners understand the purpose of their educational activities and how they contribute to their overall development.

But what happens when there is misalignment? As explored in chapter 5, a misalignment in faculty and learner understanding leads to confusion and a potentially awkward learning encounter. As both Lynn and Allison noted, it leads to the faculty-learner exchange being *artificial* when discussing assessment criteria. Faculty and learners are working together to just check a box rather than having a fruitful assessment moment. This confusion can lead to learners

feeling lost and unsure about what is required of them. According to Carless (2015), learners who do not clearly understand the goals and expectations of their curriculum are more likely to experience anxiety and stress, which can negatively impact their learning experience and performance. This misalignment in understanding can also lead to a decrease in learner motivation and engagement. When learners are unclear about what is expected of them or how their work will be assessed, they may lose interest in the subject matter. This lack of motivation can result in decreased participation, lower attendance rates, and reduced effort in completing milestones. Ryan and Deci (2020) suggest that clear goals and expectations are essential for fostering intrinsic motivation in learners, as they help learners to see the relevance and purpose of their studies. Lastly, misalignment can also lead to inconsistent assessment and feedback practices, which can further hinder learning progress. When assessment criteria are not clearly defined or communicated, learners may receive feedback that does not accurately reflect their performance or help them improve. This is true for the participants in this study, as they voiced frustration with a variance of assessment approaches between faculty members.

It is imperative that all members of a program hear the same things at the same time in order to maintain a shared understanding of the programmatic elements of their outcomes-based curricula. Ultimately, professional programs such as those in medical education, should strive to foster a large programmatic community of practice where its members have a mutual knowledge of assessment criteria and outcomes. This could potentially be achieved by, instead of having separate faculty and learner resources, offer global resources to both parties so everyone has the same content and messaging. A similar notion could be to incorporate joint meetings and development sessions for faculty and residents – Instead of hosting separate meetings, full department meetings and development sessions could be held where faculty and residents discuss

programmatic elements and assessments together. This co-learning could also assist in promoting transparency and trust building, leading to a more enriched learning environment. As Nicol (2014) notes, creating a learning environment that encourages open dialogue and communication between faculty and learners can help address any misalignment and ensure that everyone is on the same page. This notion of keeping learners and educators on the same page speaks to the overarching theme throughout the data of the necessity of a shared understanding.

What it all Boils Down to: A Shared Understanding

As discussed in chapter 5 and in the section above, the importance of everyone being on the same page at the same time is paramount to ensuring an optimal learning environment that not only cultivates professional education but can also support the requirements of an outcomes-based education framework. In outcomes-based education programs such as competency-based medical education, effective communication between faculty and learners is fundamental to the success of the aims of the program as well as the learners in them. When both parties have a shared understanding, communication becomes more efficient and productive. It allows for open dialogue, feedback, and collaborative problem-solving, which are vital components of a competency-based approach (Holmboe et al., 2017). As noted in chapter 2, when communication is not effective it can disempower and confuse learners, leaving them wondering about the fairness and functionality of the mandated outcomes and their accompanying evaluations. As Carraccio et al. (2016) note, shared understanding of educational goals is critical for maintaining the integrity of the curriculum and ensuring that it meets the evolving demands of the medical profession. This shared understanding would also help to clarify what is expected of learners at each stage of their training. In a CBME curriculum, where progression is based on the attainment of competencies, it is essential for both learners and faculty to have a clear understanding of the specific competencies required and the criteria for their assessment (Frank et al., 2010).

In order to cultivate a clear, shared understanding of the various facets of CBME, learner-faculty alignment could be achieved through a collaborative curriculum design which involves both learners and faculty in the design and development of the CBME curriculum. This would help to foster a sense of ownership and commitment to the educational process. As Iobst et al. (2010) explain, when stakeholders contribute to curriculum design, they are more likely to understand and support its objectives. Furthermore, as discussed in chapter 2, continuous just-in-time professional development focused on CBME principles and practices is not only important to knowledge attainment but it can bridge the gap between traditional educational approaches and competency-based models. Such programs equip faculty with the skills and knowledge needed to effectively implement CBME and support learners in achieving competencies (Swing et al., 2013). This would be especially important to foster as those individuals who helped develop the CBME curriculum (as noted earlier in this paragraph) either retire from teaching or graduate from their residency training program. Finally, regular feedback mechanisms which allow for regular feedback loops between learners and faculty promotes ongoing dialogue and ensures that any misunderstandings or misalignments are promptly addressed. Feedback mechanisms should be structured to allow for constructive critique and collaborative problem-solving (Hodges, 2010). These approaches could also be used in other professional programs which employ an OBE curriculum where faculty and learners operate within a learning environment focused on meeting targeted outcomes.

A shared understanding not only assists in the cultivation of an ideal learning environment, but it could also play a vital role in addressing the challenges often identified in the implementation of CBME curricula such as a resistance to change, variability in assessment practices, and the need for cultural shifts within educational institutions. As discussed in chapter

2, transitioning to a CBME curriculum requires significant changes in teaching and assessment practices. A shared understanding can help overcome resistance by ensuring that all stakeholders recognize the potential benefits of CBME and are committed to its successful implementation (ten Cate, 2013). Part of the successful implementation is ensuring standardized assessment practices and to reduce the perception of subjectivity in the assessment process. In chapter 5, participant thoughts regarding the high degree of faculty subjectivity in the use of EPA evaluation forms was discussed. Understandably, they were interested in having an EPA form which afforded more objectivity and a standardized approach from faculty in completing the forms. As evident in participant experiences, variability in assessment practices is a common challenge in CBME. A shared understanding of assessment criteria and methods would provide enhanced consistency and fairness in evaluating learners' competencies. Consistency and fairness in evaluation and learning interactions with faculty can also guide programs towards fostering a cohesive and supportive learning environment where learners feel valued and motivated. This environment is characterized by mutual respect, trust, and collaboration, which are essential for the success of an OBE or CBME curriculum (Lurie et al., 2009).

In this section, I discussed the implications of my study's thematic analysis at the intersection of the literature review. I incorporated ideas grounded in my professional and academic experience and others' scholarly work to elucidate how learners' experiences in a competency-based medical education program can help inform professional outcomes-based education programs for the betterment of learners and faculty alike. Next, I consider the implications of this study on adult education and professional education theory and further explore the implications on educational practice.

Implications for Theory and Practice

The findings of this study reveal the experiences of Pathology residents in a competency-based medical education (CBME) curriculum and have important implications for both educational theory and practice. Competency-based education has been heralded as a transformative approach that shifts the educational focus from time-based training to the achievement of specific competencies (Carraccio et al., 2016; Frank et al., 2010). However, the practical implementation of CBME in medical education reveals complex dynamics that challenge existing theoretical frameworks and highlights the need for adaptation in educational practice. This study emphasizes the critical importance of shared understanding between faculty and learners, aligning with theories of collaborative learning and shared cognition (Scardamalia & Bereiter, 2006; Shteynberg et al., 2020). The research also identifies the importance of balancing learner autonomy with structured support, offering insights into adult learning theories that stress the role of guidance in facilitating self-directed learning (Baumgartner, 2024; Knowles et al., 2015). The implications extend to the practical domain, suggesting modifications to CBME program design and implementation that can enhance learner experiences and outcomes. By integrating theoretical insights with qualitative evidence, this study contributes to a more nuanced understanding of how CBME can be effectively operationalized in medical education and how OBE can be enhanced for professional programs.

Theoretical Implications

The study's findings illustrate the need for a nuanced understanding of how CBME and adult learning theories intersect and inform each other in practice. The emphasis on shared understanding and the balance between autonomy and support calls for a more integrated theoretical approach that considers both the structural elements of CBME and the individual learner's journey. The findings offer several theoretical implications for competency-based

medical education (CBME) and adult learning theories. My hope is that the experiences of the study's participants have illuminated the complexities and challenges associated with implementing outcomes-based education in medical training programs. How sharing these stories helps to inform competency-based education and adult education theory is explored below.

Neoliberalism and Its Ongoing Impact on Competency-based Medical Education

In chapter 2, the notion of neoliberalism and its influence on outcomes-based education was explored. As seen in this study, the commodification of education prioritizing the output of skilled labour at the expense of broader educational goals such as critical thinking and creativity (Sellars & Imig, 2020) can be detrimental to learners in competency-based medical education (CBME) programs. Although Boud and Molloy (2013) noted that OBE programs can help learners stay engaged, motivated, and focused on achieving learning outcomes, ultimately leading to higher levels of academic success and personal growth, this potential positive was overshadowed by the CBME curriculum in this study. This overshadowing was especially evident in the neoliberal characteristics of standardization and accountability, the marketization of education, and the overall impact on faculty and learners in the study.

Standardization and Accountability in CBME. One of the most visible effects of neoliberalism in CBME was the emphasis on standardization and accountability. Neoliberal policies have driven the development of standardized competency frameworks, such as the Accreditation Council for Graduate Medical Education (ACGME) competencies in the United States and the CanMEDS framework in Canada (Frank et al., 2010). These frameworks are designed to ensure that medical trainees acquire the necessary skills and knowledge to practice safely and effectively, with clearly defined outcomes that can be measured and assessed.

While standardization can promote consistency and fairness in medical training, it also reflects neoliberal values by prioritizing efficiency and measurable outcomes in a field that is seen as having direct economic value (Lerch et al., 2022). Medical education programs are increasingly required to demonstrate their effectiveness through detailed assessment data, linked to accreditation and often funding (Hodges, 2010). As seen in this study, the focus on accountability ensured that Pathology programs maintained mandated outcome standards, but it also led to a narrowing of educational experiences. Jarvis-Selinger et al. (2012) caution that the development of competencies that are easily measured often take precedence over broader, less quantifiable aspects of medical practice, such as empathy and professional identity formation. This was affirmed by participants who noted that the program competencies felt like a checklist for them to complete and were more of a barrier to authentic educational moments with faculty than an enabler. Participants also identified the most fulfilling professional identity formation moments as interdisciplinary and interprofessional sessions where they were able to interact with colleagues across healthcare teams and envision Pathology's role within them.

The Marketization of Medical Education. Neoliberalism's influence extends to the marketization of medical education, where education is treated as a commodity, and institutions compete for students, resources, and prestige. As Brown (2015) notes, this market-driven approach is evident in the growing emphasis on rankings, reputation, and employability of graduates, which can shape how CBME is delivered. Medical schools may prioritize competencies that align with market demands, such as technical skills and knowledge, over those that contribute to the holistic development of physicians. This commodification of prescribed skills and knowledge presented a barrier for two of the study participants whose previously acquired Pathology lab experience was not taken into account. Instead of being afforded an

opportunity to show competence in early program outcomes that they felt they could achieve, they were required to show competence in due time so as to follow the assigned path of the program. This disregard for the learners' holistic development within the confines of the program was discouraging and confusing for participants.

Furthermore, the marketization of medical education can also exacerbate inequalities within the system. Institutions with more resources are better equipped to develop and implement comprehensive CBME programs, while under-resourced schools may struggle to meet the demands of accreditation bodies and market expectations (Apple et al., 2023). This disparity can result in unequal access to high-quality medical education and training, with potential consequences for patient care and health equity. This disparity could be problematic for programs and their ability to provide viable educational opportunities for their learners to achieve outcomes that require a simulation exercise or other novel teaching methods. A lack of funding could also be a barrier to enhancing interprofessional teams and providing structured interprofessional activities, as noted in chapter 2 as important in modern healthcare workers' development.

The Impact on Faculty and Learners. Neoliberalism's emphasis on efficiency and productivity has a significant impact on faculty and learners in CBME programs. Faculty members face increased pressure to produce measurable outcomes, often in the form of assessments and evaluations, which can detract from their ability to engage in meaningful teaching and mentoring (Bleakley, 2015). As seen in this study, the focus on competencies and outcomes sometimes led to a transactional relationship between faculty and learners, where the educational experience was reduced to the acquisition of discrete skills and knowledge, rather than fostering a deeper understanding of the complexities of medical practice. This became

especially apparent in this study where learners in a diagnostic-focused study, such as Pathology, spend their days often sitting alongside faculty and reviewing clinical cases together, receiving in-the-moment verbal feedback. Participants expressed how moving from these rich verbal teaching moments to having to ask for formal documented feedback on an assessment form was often uncomfortable. The assessment forms were then felt to be redundant and sometimes did not reflect the verbal feedback received, as faculty were not always sure what overall rating they were *allowed* to give the learner. The expectation of faculty providing formal feedback detracted from the in-the-moment mentoring experiences, leaving learners feeling confused and wondering if they misjudged the interaction.

Additionally for learners, the neoliberal emphasis on self-regulation and individual responsibility can create a high-stakes environment where success is measured by the attainment of competencies and performance on standardized assessments. Dyrbye and colleagues (2019) explain that, while this can motivate learners to achieve excellence, it can also contribute to stress and burnout, as learners may feel pressured to conform to rigid competency frameworks at the expense of their well-being and personal development. This notion was affirmed in the study, as participants expressed stress in managing the volume of outcomes required in their program and having to actively seek out enough opportunities to show achievement in each area. The stress of conforming to the CBME framework was also expressed by the most senior resident, Allison, who was in her fourth year of the program. She was a member of the first cohort to have part of their certification exam moved from the spring of their fifth year of training to the spring of their fourth year. In both the focus group and individual interview, she expressed extreme stress in trying to find opportunities to cover all clinical case material that may be on the exam while achieving outcomes to stay on track in her program. She noted that this stress had affected

her not only academically, but also in her personal life. And, although typically resilient, the overwhelm had led her to feeling anxious and unsure about her academic ability.

When viewing competency-based medical education through the lens of neoliberalism, the tension between a reductionist approach to education and a learner-centred curriculum is apparent. As Cabanas and González-Lamas (2022) note, the reliance on quantitative measures can be limiting, as it may overlook the complexities and nuances of the educational process. The drive for efficiency and accountability under neoliberalism can lead to a narrowing of educational focus, potentially stifling the broader, more personalized learning experiences that are essential for developing competent, adaptable healthcare professionals. The study adds to existing literature by asserting the need to balance these conflicting demands by incorporating adult education theory and practice into the design and implementation of CBME. It demonstrates how careful consideration is required to maintain the integrity of learner-centered approaches while still meeting the external demands for measurable outcomes and accountability. How this may look as the field continues to develop is explored next.

Informing the Competency-Based Medical Education Landscape

This research study contributes to the existing literature centered on competency-based medical education (CBME) by affirming the critical role of shared understanding between faculty and learners. In existing literature, there is an emphasis on the importance of clear communication and mutual comprehension of educational goals in competency-based frameworks (Hodges, 2010; Frank et al., 2010). However, in this study, the necessity of a shared understanding is underscored by the interpretive theme that emerged from participant experiences, suggesting that without a common interpretation of competencies and objectives, the potential benefits of CBME may be compromised. This finding supports the notion that

successful implementation of CBME requires not only the articulation of clear competencies but also the cultivation of an educational environment where these competencies are consistently interpreted by all stakeholders (ten Cate, 2017).

Additionally, the study extends and adds to current CBME theories by illustrating the dynamic nature of learner autonomy and the potential pitfalls of an abundance of empowerment without adequate guidance. While CBME aims to foster self-directed learning and greater learner agency (Carraccio et al., 2016), this research exhibits that learners may experience disorientation or reduced motivation if they are not adequately supported. Therefore, I suggest that CBME programs should balance autonomy with structured support to ensure that learners remain engaged and on track with their training objectives. This may look like an enhanced EPA tracking tool beyond what is currently available, having regular check-ins or coaching meetings with a faculty member well-attuned to the various EPAs and stages of training, and/or having more support in individualized learning paths from a Program Director or Program Administrator. It would also be wise for programs to simply ask their learners what else they require to not only survive but to thrive in their program. This sounds almost too easy, yet is likely an oversight in many programs where the stakeholder focus is in the implementation and faculty development details and not with the nuanced details of the learner experience.

Another opportunity to benefit the learner experience in CBME programs is to encourage the development and ongoing review of specialty and program-specific entrustment scales. One of the primary benefits of specialty-specific entrustment scales is their ability to assess competency more accurately. Each medical specialty demands a unique set of skills and knowledge, and entrustment scales that reflect these specific competencies provide a more relevant and precise measure of a resident's readiness for independent practice. This approach

aligns with the arguments presented by ten Cate and Scheele (2007), who emphasize the importance of competency-based training in bridging the gap between theoretical knowledge and clinical practice. Although specialty-specific entrustment scales were initially developed for each residency training program via working group meetings with the Royal College, I have seen first-hand that once they are in use in a program they may not be as suitable in-practice as the working group thought they would be. Often, faculty or learners are confused by details in the wording of the evaluation form's entrustment scale (entrustment scale is the term used for an EPA evaluation form's narrative Likert scale) or the scale doesn't quite fit what the EPA is aiming to assess. Having programs regularly review and potentially modify the scales for the benefit of faculty and resident alignment of understanding would be ideal. These more fitting scales would provide learners with clearer, more targeted feedback on their performance and reduce faculty subjectivity. When residents understand precisely what is expected of them in their specialty, they can focus their efforts on developing the skills most relevant to their future practice. As ten Cate and Scheele (2007) explain, targeted feedback from faculty leads to more efficient learning and better preparation for independent practice. This is especially important for lesser-represented diagnostic-focused specialties such as Pathology, where initial entrustment scales were developed with surgical specialties with observable procedures in mind.

Informing Adult Learning Theory

In relation to adult learning theories, this study provides insights into how learners in professional education settings navigate the challenges of an outcomes-based curriculum. It also points to the importance of recognizing individual needs holistically within a regulated curriculum. As discussed in chapter 2, a learner-centered focus acknowledging individuals' holistic needs must be central in an outcomes-based program (Jarvis-Selinger et al., 2012). Especially in professional outcomes-based education (OBE) programs, active learning strategies

are essential for addressing the holistic needs of learners, ensuring they are not only equipped with the necessary knowledge and skills but are also prepared for working in their professional environments. Active learning strategies such as case-based learning, simulations, and problem-solving exercises can be particularly effective in ensuring learners' success. According to Freeman et al. (2014), active learning significantly enhances the ability to retain and apply knowledge, which is vital for achieving the outcomes required in professional programs. By engaging with material in a hands-on, practical manner, learners are better prepared to meet the demands of their future careers.

Furthermore, active learning strategies that involve teamwork, peer teaching, and collaborative projects help students develop emotional intelligence and social competence by fostering communication, empathy, and conflict resolution abilities. McKeachie and Svinicki (2013) emphasize that such collaborative activities not only improve academic outcomes but also prepare learners for the interpersonal dynamics they will encounter in professional settings. Lastly, active learning activities encourage learners to consider the ethical implications of their actions and decisions, fostering a strong sense of professional responsibility. Mezirow's (2018) theory of transformative learning highlights the role of reflection in deepening understanding and promoting ethical behavior. In professional OBE programs, this reflective practice is crucial for ensuring that learners not only achieve technical competence but also develop the moral compass necessary for ethical professional practice. This study points to the need for active learning strategies to be incorporated into every layer of an OBE curriculum so that individuals and their unique needs are not overshadowed by mandated outcomes.

The study's findings also resonate with Knowles and colleagues (2015) principles of andragogy, particularly the need for learners to understand the relevance of their learning

experiences. There was a disconnect identified by two of the study's participants between their prior work and learning skills and the mandated outcomes of their program. This highlights the importance of connecting new learning requirements to learners' existing knowledge and experiences. This connection is essential for fostering intrinsic motivation and facilitating meaningful learning, as adult learners are more likely to engage with content that is perceived as relevant and applicable to their professional practice. Extrapolating from a point made above, in order to adhere to its learner-centered claims, outcomes-based programs should consider incorporating a prior learning assessment component to their programs for learners who enter the programs with a non-traditional background.

Finally, the concept of a community of practice, as described by Wenger (1998), emerges as a critical support mechanism within the OBE context. The findings demonstrate how learners benefit from peer interactions, mentorship, and collaborative learning, which align with the social dimensions of learning emphasized in Wenger's theory. Communities of practice offer a platform for learners to share experiences, negotiate meanings, and develop a sense of professional identity, thereby enhancing the learning experience within outcomes-based frameworks (Orsmond et al., 2022). In this study's case, the organic evolution of a CoP due to learner necessity in navigating the CBD program was central to learner success and wellness.

In sum, this study contributes to the theoretical discourse on CBME and adult education by offering qualitative evidence on the factors that influence learner experiences in an outcomes-based curriculum. By highlighting the necessity of shared understanding, balanced autonomy, and community support, this research affirms and adds to the literature underscoring the importance of a holistic approach to designing and implementing educational programs that meet the diverse needs of learners in professional programs.

Practical Implications for Outcomes-based Programs and Competency-based Medical Education Programs

The findings of this study provide several practical implications for the design and implementation of outcomes-based education (OBE) and competency-based medical education (CBME) programs, particularly in diagnostic-focused specialties like Pathology. By examining the lived experiences of residents navigating a CBME curriculum, this research highlights key areas where educational practice can be enhanced to better support learner development and program efficacy. As discussed throughout this chapter, practical implications for educational practice include:

Table 2

Summary of Practical Implications for OBE and CBME Programs

Practical Implication	Explanation	Actionable Insight
Tailored learning approaches which acknowledge individuals' breadth of experience	Aligning OBE/CBME with learners' existing skills and knowledge.	Implementing prior learning assessments and customized learning plans to improve educational outcomes and learner motivation.
Negotiating an appropriate level of agency and support for learners	Balancing autonomy with necessary guidance for learners.	Establishing regular feedback, mentorship, and other support mechanisms (such as simulation or virtual reality-based opportunities for EPAs and an enhanced EPA tracking tool) to ensure clarity and achievement of outcomes. Regularly conducting informal needs assessments of learners – Asking what else they require to not only survive but to thrive in their program.
Faculty training and development	Ensuring faculty are well-versed in OBE/CBME principles and objectives.	Investing in faculty development resources and programming to improve teaching practices and support ongoing faculty learning.
Shared understanding between faculty and learners	Importance of a mutual understanding of competencies and goals.	Facilitating clear communication and collaboration to create a cohesive learning environment. Hosting shared development sessions to ensure an alignment of

		messaging and understanding for all parties. Development and ongoing review of specialty and program-specific entrustment scales.
Cultivating communities of practice (CoPs)	The value of peer support and collaborative learning in educational programs.	Encouraging the development of CoPs to foster professional identity and knowledge exchange. Not only with peer groups, but also with an intentional program-wide CoP.

The practical implications of this study underscore the importance of a learner-centered approach in OBE and CBME programs, emphasizing personalized learning, balanced autonomy, faculty development, community engagement, and an adaptive curriculum. By addressing these key areas, professional and medical education programs can enhance the effectiveness of an outcomes-based curriculum and better prepare learners for their professional roles.

Limitations of the Study

While this study provides valuable insights into the experiences of Pathology residents in a competency-based medical education (CBME) curriculum and extends to the learner experience in an outcomes-based education (OBE) professional program, there are limitations which must be acknowledged. These limitations pertain to the study's design, methodology, and scope, which may affect the generalizability and interpretation of the findings.

Methodological Constraints

The use of an instrumental case study design, while beneficial for an in-depth exploration of specific experiences within a particular context, inherently limits the generalizability of the findings. Case studies focus on a particular group or setting and do not aim to produce results that can be universally applied (Stake, 1995). In this study, the experiences of six Pathology residents at varying stages of their training in a Canadian residency program were examined. Although the insights gained are rich and contextually meaningful, they may not fully represent

the experiences of residents in other specialties, programs, or geographic locations. While an extrapolation of the findings within an adult education context can be made to other OBE and CBME programs, nuanced contextual factors must be considered for applications beyond medical education and professional education curricula.

Interpretivist Research Paradigm

The interpretivist research paradigm employed in this study emphasizes understanding participants' subjective experiences and the meanings they assign to their educational context (Merriam, 2016). While this approach provides a nuanced view of learner experiences, it is inherently influenced by my interpretations and potential biases as the researcher. The reliance on qualitative methods such as focus groups and semi-structured interviews means that the data collected is susceptible to researcher influence and the dynamics of the participant-researcher relationship (Creswell & Poth, 2016). Although efforts were made to minimize bias through reflexivity and researcher journaling, complete objectivity is not a goal within an interpretivist paradigm.

Sample Size and Diversity

The study's small sample size of six participants, while appropriate for a case study design, potentially limits the diversity of perspectives captured. The participants, who are at different stages of their Pathology residency, may not fully represent the broader spectrum of experiences and challenges encountered by residents in other stages or specializations. Additionally, the study did not include perspectives from other stakeholders, such as faculty members, program directors, or program administrators, which could have provided a more comprehensive understanding of the CBME implementation process and its ongoing challenges and successes.

Document Analysis Limitations

Document analysis of relevant Pathology program and Royal College materials was conducted to contextualize the competency-based design and faculty and resident development materials. However, the documents reviewed may not fully capture the breadth of policies, expectations, and informal practices that influence residents' experiences. The dynamic nature of educational policies means that documents can quickly become outdated, potentially limiting the study's relevance to current practices. Furthermore, documents often reflect the intended design and implementation of educational programs rather than their actual application and reception by learners (Bowen, 2009).

Focus Group and Interview Dynamics

Focus groups and semi-structured interviews are powerful methods for acquiring in-depth insights but are subject to certain limitations. Focus group discussions can be influenced by group dynamics, with more vocal participants potentially dominating the conversation, leading to underrepresentation of quieter voices (Krueger, 2014). Similarly, individual interviews rely on participants' willingness to disclose their experiences and perspectives, which may be shaped by social desirability or fear of negative repercussions. To mitigate these effects, I employed strategies such as establishing rapport and ensuring confidentiality, yet these challenges cannot be entirely eliminated.

Potential for Researcher Bias

Researcher journaling and notes were utilized to enhance reflexivity and track the research process. However, the interpretive nature of this approach means that my perspectives and preconceptions as the researcher could and did influence data interpretation and analysis. Acknowledging and addressing researcher bias is essential, yet complete neutrality is challenging to achieve in qualitative research. Indeed, it is not sought. The iterative nature of qualitative

analysis, while valuable for depth, also means that findings are interpretative rather than definitive (Patton, 2014). That being said, I also acknowledge that my unique researcher perspective brings a distinct viewpoint to the study's findings which resonates with the spirit of the role of the researcher in qualitative research.

Implications for Future Research

Despite these limitations, the study provides valuable insights into the implementation of CBME and its impact on learner experiences. Future research could address these limitations by incorporating larger and more diverse samples, exploring different specialties, and including perspectives from a broader range of stakeholders. Longitudinal studies could also offer insights into how learner experiences and competencies evolve over time in CBME programs.

Additionally, quantitative approaches could complement qualitative findings, providing a more comprehensive understanding of CBME's effects and challenges. These future research directions are explored further in the next section.

Future Research Directions

The findings and limitations of this study open several avenues for future research that can further elucidate the complexities of outcomes-based education (OBE) and its impact on professional programs and competency-based medical education (CBME) and its impact on medical training. By expanding the scope and depth of inquiry, future studies can provide a more comprehensive understanding of how OBE and CBME frameworks operate across different contexts and contribute to the development of more effective educational strategies.

Expanding Participant Pools' Diversity and Size

Future research should aim to include larger and more diverse participant pools to enhance the generalizability of findings. While this study focused on six Pathology residents within a Canadian residency program, subsequent research could examine a broader range of

specialties, geographic locations, and training stages. Including learners from different backgrounds and varying levels of experience would provide a more holistic view of how CBME is experienced across the medical field. Additionally, exploring the perspectives of other stakeholders, such as faculty, program directors, program administrators, and patients, could offer valuable insights into the broader implications and effectiveness of CBME programs (Wong et al., 2013) and provide further generalizability to other OBE programs.

Longitudinal Ethnographic Studies on Competency Development

Longitudinal ethnographic research designs would be particularly valuable in examining the long-term impact of CBME on residents' competency development and professional trajectories. By tracking learners over time, researchers could assess how competencies evolve and are retained beyond the educational program. As MacLeod (2016) notes, ethnographic research is helpful in graduate medical education as it aims to provide a detailed and insightful description of an individual's unique experiences. Ethnography's growing use in medical education highlights its effectiveness in rigorously examining the cultural aspects that influence and shape the field. Such studies could explore the transition from residency to independent practice, evaluating how well CBME prepares graduates for the demands of clinical work and continuous professional development. Longitudinal data could also reveal patterns and factors that influence successful competency acquisition and application in real-world settings (Durning et al., 2010).

On a different note, a different longitudinal study could potentially aim to answer the question of whether a CBME curriculum facilitates a positive impact on patient care. Although this is a much broader dynamic question that spans beyond the learner experience in CBME programs, patient care was an impetus for the curricular change so it would be interesting to know if this objective has come to fruition or not.

Integrating Mixed Methods and Multidisciplinary Approaches

An ongoing tension in my experience as a medical education researcher and educator has been the unspoken strain between the qualitative realm of educational research and the quantitative realm of the practice of medicine. Although I have seen a slow shift in my scientific-minded colleagues' understanding and appreciation of qualitative research, an integration of quantitative research methods could assist in the reception of research study outcomes by speaking a research language that the medical community is attuned to. On a broader level, combining quantitative and qualitative research methods could enrich the understanding of CBME's effects by providing both breadth and depth of insight. Quantitative studies, such as surveys or assessments, can quantify the prevalence of specific experiences and outcomes across larger populations, while qualitative approaches can explore the underlying reasons and contexts for these patterns. Mixed-methods research designs have the potential to offer a more comprehensive picture of how CBME impacts learner outcomes, program effectiveness, and educational environments (Creswell & Clark, 2017) while offering data for both clinician faculty and learners, and educators alike. A mixed methods approach may also appeal to other scientific-based professional programs that have introduced an OBE framework.

Beyond employing mixed methodological approaches to engage varied stakeholders lies an opportunity in cultivating multidisciplinary research teams. As MacLeod and colleagues (2020) explain, including a diverse team of researchers from varied backgrounds in health education research can enhance understanding and drive innovation. By exploring health and medical education from multiple perspectives (for example, through reading work from various paradigms, considering new viewpoints, or participating in multidisciplinary projects), embracing a breadth of paradigms allow researchers to tackle critical issues in health education creatively.

Investigating the Role of Technology in CBME/OBE

As technology continues to play an increasingly important role in medical and professional education programs, future research could explore how digital tools and platforms can support the implementation and assessment of CBME/OBE curricula. Studies could examine the effectiveness of e-learning modules, simulation-based training, and digital assessment and tracking tools in enhancing competency development and learner engagement. Additionally, research could investigate how technology can facilitate communication and shared understanding among learners and educators (Ellaway & Masters, 2008), addressing some of the challenges identified in this study.

Exploring Interdisciplinary and Interprofessional Education

Given the collaborative nature of modern healthcare, research into interdisciplinary and interprofessional education within CBME frameworks is important. Studies could investigate how integrating interdisciplinary approaches into CBME curricula can prepare residents for team-based care and potentially improve patient outcomes. This research could examine how competency and outcomes-based frameworks are adapted and applied across different professions and the impact of interdisciplinary training on learners' skills and professional identities (Thistlethwaite, 2015).

Evaluating Faculty Development and Support Mechanisms

Future research should also focus on faculty development and the role of educators in OBE/CBME implementation. Investigating effective strategies for faculty training and support can provide insights into how educators can be better equipped to facilitate competency-based learning. Research could explore how faculty perceptions of an outcomes-based curriculum influence teaching practices and the ways in which ongoing professional development can align faculty understanding with program objectives (Hurney et al., 2016). On a more granular level, it

would be helpful for specialty or program-specific studies to be undertaken so minutiae of the faculty experience in various settings can be discovered. As seen in this study, a broad implementation of a curriculum that does not account for unique programmatic factors presents a significant challenge in faculty engagement and understanding. In a similar vein, strategies to couple faculty development with learner development could be explored and studied to assist in the understanding of the value of these parties collaboratively sharing and generating knowledge.

To summarize, future research directions in OBE/CBME could prioritize diversity in participant pool, longitudinal approaches, mixed-methods designs, technology integration, interprofessional education, and faculty and learner development. By addressing these areas, researchers can contribute to an even deeper and more nuanced understanding of CBME, ultimately informing the design of more effective and learner-centered medical education programs.

Conclusion

This study offers important insights into the experiences of Pathology residents within a competency-based medical education (CBME) curriculum, highlighting the benefits and challenges of an outcomes-based educational approach. By examining the lived experiences of medical residents, this research sheds light on the complexities of implementing CBME in a diagnostic-focused residency program and provides contributions to the fields of medical education and professional education. It also provides important insights into the study of outcomes-based programs by emphasizing the importance of a holistic approach to education and avoiding a reductionist framework as cautioned in the literature. Concepts of adult education at the intersection of outcomes-based curricula need to be implemented to ensure learner success.

The study challenges the concept of OBE in the form of CBME being a learner-centred approach to education which supports a constructivist theory of learning. Although other OBE programs may fulfill these aims, the construct of a diagnostic-focused residency training program falls short in fully providing the opportunity to see the merit in a competency-focused curricula. Instead, a symbiotic relationship between mandated outcomes and the educational environment of a diagnostic-focused residency program should be sought using the approaches noted earlier in this chapter. Adult education theory should be included in the conversation regarding curriculum design and acknowledging the holistic needs of learners. As with other facets of professional education, such as continuing professional development (Coady, 2015), adult education has the potential to play a crucial role in shaping and evolving the understanding and implementation of CBME in the years to come.

Summary of Key Findings

The study identified several descriptive themes that illuminate the experiences of residents in a competency-based medical education (CBME) curriculum: the benefits of an outcomes-based approach, the gap between prior skills and mandated objectives, the balance between learner autonomy and structured support, the role of community practice as a critical support mechanism, and the importance of shared understanding between faculty and learners. These themes underscore the multifaceted nature of CBME and OBE programs, revealing both its potential advantages and the challenges it poses to learners and educators.

One of the most significant findings is the necessity of a shared understanding between learners and educators. The alignment of expectations, competencies, and educational goals is crucial for the effective implementation of CBME/OBE programs, as discrepancies in understanding can lead to confusion and hinder learning outcomes (Frank et al., 2010; Holmboe

et al., 2017). This shared understanding is essential for fostering a supportive learning environment where residents can develop the competencies required for their professional roles. It is encouraging to see this need reflected in certain emerging literature but there is still a gap in demonstrating how this disconnect can be resolved. This study helps to narrow the gap, with the recommendation of utilizing adult education theory and practical approaches to ensure learner centricity is not an afterthought in the planning and implementation of CBME/OBE programs.

Final Reflections

This study provides a detailed exploration of the experiences of Pathology residents within an outcomes-based professional program, underscoring the complexities and opportunities that come with outcomes-based education and competency-based medical education. By emphasizing the importance of shared understanding, learner-centered strategies, and structured support, the research contributes to the ongoing dialogue on how to optimize medical education via adult education theory and practices for the benefit of learners and the healthcare system. As medical and professional education continues to evolve, these insights can inform the development of more effective and responsive educational programs that prepare learners for the dynamic and demanding nature of professional practice.

From a personal perspective, I am thankful to have the opportunity to tell my participants' stories and add to the discourse currently available on CBME and OBE. I hope that, by sharing participant experiences, this research study aids in educators and policy makers' thinking differently about outcomes-based education and draws their attention to the necessity of keeping learner centricity as a fundamental interest when developing and mandating such frameworks. I also hope that this work serves as a catalyst for other social scientists to explore what actually happens *on the ground* in outcomes-based professional programs, enabling the voices of other learners to be heard.

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Appendix A: Focus Group Guide

Introduction

Hello everyone and welcome to our focus group session. Thank you for taking the time to talk about competency-based medical education today. My name is Margaret Garnier-Liot and I am a PhD Candidate in Adult Education at StFX. I am also the Education Leader for Diagnostic Radiology at Dalhousie but am here today in my role as researcher for my PhD work. My research focuses on learning more about the resident experience in programs that have transitioned to a competence by design model, especially the lesser-studied diagnostic programs. You were invited to take part in this discussion today since you are a current resident in such a program.

To aid our discussion today, I will be using a guide I have prepared with some questions for you. As we chat, please feel free to share your point of view even if it differs from what others have said. There are no wrong answers but rather differing points of view. I am just as interested in negative comments as positive comments, and at times the negative comments are the most helpful. You've probably noticed that I have a recording device with me today. I will be recording the session so I don't miss any of your comments – I likely can't write fast enough to capture the discussion and don't want to miss any helpful comments. We will be on a first name basis today, but your names will not be used in the session transcription or my dissertation, as you will all be assigned a pseudonym to maintain confidentiality. With that, let's begin. You likely all know each other but if we could go around the table and tell me your name and PGY level I'd appreciate it.

Guiding Questions

What is your understanding of competency-based medical education (CBME)?

- How did you learn about CBME (from your home program, in your Undergraduate program, etc.)?

What has your experience in a competency-based residency training program been like?

- Experience as a learner, in terms of receiving feedback, being empowered to cultivate learning experiences, etc?
- Can you think back to a time that you had an impactful learning experience, positive or negative, because of competence by design (CBD)?
- What do you like the most about CBD?
- What do you like the least about CBD?

Ending Question

Suppose you were able to make one change with the CBD curriculum that would make it better for residents. What would you do and why?

Summary Question

Summarize discussion, then ask “Is this an adequate summary?”

Final Question

Review the purpose of the study, then ask “Have we missed anything?”

Appendix B: Interview Guide

Introduction

Thank you for taking the time to meet with me today. I'm glad to have the opportunity to talk to you more about your experiences as a resident in a competency-based medical education program and to explore some of the ideas that came up in the focus group. I am recording our conversation today so that it can be transcribed but, as I mentioned at the focus group, you will be assigned a pseudonym in the transcript and in my dissertation. I do have an interview guide to help make sure we cover the bases today, but I am happy to leave the conversation open-ended to make sure we can cover your experiences and insights. Do you have any questions before we begin?

1. You're a PGY[program level] in [Pathology program name], right? And you've been a part of a competence by design (CBD) curriculum system since you started residency. You mentioned in the focus group that you first learned about CBD during [experience noted], right?
2. Do you feel like you received sufficient information about the purpose of the CBD curriculum from your program?
3. In the focus group, we talked about how, in Pathology, you have a lot of one-on-one time with faculty which results in verbal feedback in real-time. Thinking about your interactions with faculty, can you tell me about a typical day on a clinical rotation and the type of interactions you have with faculty?
 - Do you receive informal/verbal feedback on a daily basis?
 - Do you receive formal/written feedback on a daily basis?
 - How would you describe the feedback interactions you have with faculty?
 - Do feedback interactions feel like authoritarian (top-down) or coaching (peer-to-peer) conversations? Can you share an example?
 - How do these feedback interactions make you feel empowered or disempowered?
 - Do interactions with faculty help you reflect on your role in the healthcare environment and/or patient care?
4. In your opinion, how does CBD affect your learning on a typical day on a clinical rotation?
 - Can you share an example?
5. Are you finding that CBD enhances or hinders your experience as a medical trainee?
 - Can you share an example?
6. What would an ideal learner experience in a CBD curriculum look like?

Further from the focus group:

7. We talked about how EPAs can help give a structure to rotations because residents know what they "should" accomplish from a clinical perspective. Do you feel like this also helps you know what being a Pathologist in practice may look like?

8. We also heard about how residents sometimes need to coach faculty when it comes to EPA completion. Is this empowering or daunting?
9. Is there anything else that we missed? Anything you would like to add?