DEVELOPING HOLISTIC SKILL SETS

DEVELOPING HOLISTIC SKILL SETS: EVALUATING THE USE OF MICROCREDENTIALS IN HIGHER EDUCATION

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A Thesis Submitted to the School of Graduate Studies in Partial Fulfilment of the Requirements for the Degree Master of Science

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# Abstract

As a primary source of emerging talent, post-secondary institutions are positioned at the forefront of education and skill development. Today, university graduates face a new challenge as employers look to skill-based hiring methods. However, challenges remain in defining, evaluating, and presenting global health-related professional and transferable skills in a way that is understood by students, institutions, and employers. Microcredentials, typically represented by online icons, graphics, or badges indicate the successful completion of a learning experiences from an accredited institution. As such, research suggests that microcredentials offer graduates the opportunity to validate their transferable skills and present them in meaningful ways when emerging into the labour market.

This study designed, implemented, and evaluated a microcredential project in the Master of Science Global Health (MSc GH) program as an approach to consolidate, evaluate, and credit transferable skills (i.e., international collaboration and incisive decision-making). Employing the Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) framework along with the feasibility outcome from the Implementation Outcomes Taxonomy, this study aimed to comprehensively evaluate the use of microcredentials within the MSc GH program at McMaster University.

The results of this study demonstrate that the inclusion of microcredentials into the broader curriculum may enhance the learning experience by providing students with an opportunity to reflect, consolidate, and be credited for their transferable skills. Further, the data presented in this thesis will provide future curriculum developers and educators with new insights on how to build and incorporate successful microcredential programs to support graduate students through their transition to the labour market.

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# List of Abbreviations

**A2L:** Avenue 2 Learn

**CBE:** Competency-Based Education

**CUGH:** Consortium of Universities for Global Health

**GH:** Global Health

**HiREB:** Hamilton Integrated Research Ethics Board

**HyFlex:** Hybrid Flexible

**LMS:** Learning Management System

**RE-AIM:** Reach, Effectiveness, Adoption, Implementation, Maintenance

**MOOCs:** Massive Online Open Courses

# Declaration of Academic Achievement

Abby Tristani was responsible for all aspects of this thesis, including data collection, analysis, and thesis preparation.

Menna Komeiha assisted with data collection in chapter three.

The thesis committee advised on all aspects of this thesis.

# Chapter 1: Introduction

As university graduates transition into the labor force, they face an increasingly competitive and dynamic job market that demands both academic credentials and practical skills (Lauder & Mayhew, 2020). Currently however, there exists a gap within fields such as global health (GH) to define, evaluate, and present field-related professional and transferable skills in ways that are understood by students, institutions, and employers (West et al., 2020). This gap creates a missed opportunity to align graduates’ professional and transferable skills with those desired by employers in dynamic fields. Transferable skills, commonly referred to as professional, soft, or employable skills, are suggested to endure and transcend the marketplace trends (D2L, 2018). In this way, the integration of microcredentials into GH education presents a promising pathway for equipping emerging professionals (i.e., students) with specialized, flexible skills to address the complex challenges of the GH-related employment landscape. As the demand for highly targeted expertise grows, microcredentials offer an innovative approach to lifelong learning, allowing students to acquire specific competencies that traditional degree programs may not fully provide (Zdunek et al., 2024). However, understanding how microcredentials are developed, implemented, and evaluated is critical to ensuring their effectiveness and scalability within the GH sector.

Microcredentials are particularly relevant in GH due to the field’s interdisciplinary nature and the need for rapid knowledge acquisition in areas such as epidemiology, health policy, and health systems management (Chen et al., 2020). For graduates entering the GH workforce, microcredentials provide an opportunity to bridge the gap between broad academic training and the specialized skills required within a sector characterized by constant innovation and evolving health crises (Zdunek et al., 2024). Despite the clear benefits, there exists a lack of comprehensive research on the effectiveness of microcredentials and their alignment with professional needs in GH, creating a pressing need for further investigation.

The development and implementation of microcredentials in GH education remain underexplored areas, particularly in terms of how these programs are designed to meet the evolving demands of the labour market (Khen et al., 2023). Evaluating both the development process and the implementation of microcredentials is essential to understanding the impact on learning outcomes, professional advancement, and the integration into the broader GH graduate curriculum. Such research is necessary to identify best practices, barriers, and opportunities for improving the effectiveness and reach of microcredentials within this field (Khen et al., 2023). The purpose of this study is to evaluate the development and implementation of a microcredential program within GH, with the aim of identifying key factors that contribute to success while identifying potential limitations. Understanding these dynamics will contribute to the ongoing refinement of educational strategies in GH, ensuring that microcredential programs are effectively meeting the needs of both learners and employers in the broader GH workforce.

## Objectives

In the summer semester of the 2024 academic year, the Master of Science in Global Health (MSc GH) program at McMaster University released two free, web-based microcredentials entitled *International Collaboration* and *Incisive Decision-Making*. These microcredentials were aimed at graduate level students seeking to improve their knowledge of key GH competencies, with a focus on ways to quantify their learnings and penetrate the growing labour market. These courses worked to satisfy the existing definitions of microcredentials in that they provided targeted, skill specific learning opportunities and offered flexible and short-term learning pathways that could be completed alongside other professional or academic commitments (Gooch et al., 2022). This study evaluated the development and implementation of the aforementioned microcredentials by employing the RE-AIM framework (Glasgow et al., 1999) alongside the feasibility outcome from The Implementation Outcomes Taxonomy (Proctor et al., 2010) to understand the microcredentials impact and inform future revisions in addition to the curriculum.

## Statement of the Problem

This study explores the implementation of microcredentials in the MSc GH program at McMaster University. The MSc GH program is interdisciplinary in nature and seeks to provide students with the comprehensive competencies necessary for careers within various global sectors (McMaster University, 2024c). That is, as students in this program seek to pursue careers within a globalized sector of the labour market, the completion of microcredentials may support their identification, consolidation, and presentation of transferable skills in ways that are attractive and easily understood by potential employers. As the labour market increasingly looks to skill-based hiring (Wright, 2023), the integration of microcredentials in the MSc GH program aims to offer students the opportunity to demonstrate their acquired transferable skills to future employers in a meaningful way.

## Research Questions

The following questions aimed to guide the study:

* What factors contribute to the successful implementation of microcredentials in the MSc GH program at McMaster University?
* To what extent are the microcredentials successful in providing participants with transferable skills for professional development?

# Chapter 2: Background

## The Role of Microcredentials in Global Health Graduate Education

### *Definition of Microcredentials*

Microcredentials are a formalized means of skill-based demonstrations of knowledge or skill sets (Gooch et al., 2022). These may include digital badges, certificates, or other forms of recognition earned by individuals after completing a targeted education program (Gooch et al., 2022). Microcredentials encompass a diverse range of focused learning experiences that are designed to impart specific knowledge (Gooch et al., 2022). The concept of microcredentials has evolved from early forms that have accredited students with certifications regarding the mastery of technical skills (West et al., 2020); as this field has progressed, the digital era has given rise to innovative methods that demonstrate the successful completion of learning experiences (Selvaratnam & Sankey, 2021). Current trends within microcredential research display a growing demand for flexible, skill-oriented education in alignment with industry needs (Gauthier, 2020). As the labour market has moved towards skill-based hiring strategies (Wright, 2023), demonstrations of transferable skills may prove to be beneficial.

### *Microcredentials in Higher Education*

University graduates are increasingly expected to secure meaningful employment and contribute to the economic and social development of a nation (Lauder & Mayhew, 2020); however, millions of graduates will enter an increasingly competitive and globally connected workforce (West et al., 2020). Increased job automation, technological advancements, and the evolution of the global economy have largely disrupted the labour market resulting in the need to adapt the skills of current and emerging workforces (Gooch et al., 2022; ICTC-CTIC, 2022). As 32.9% of Canadians have a bachelor’s degree or higher, post-secondary institutions act as primary sources of emerging workforce talent, positioned at the forefront of education and skill development (John, 2020). Developing and having a method upon which to reflect transferable skills establishes the foundation for continuous learning that will assist students in navigating an everchanging educational and employment landscape (Teng et al., 2019). In this way, identifying and consolidating students’ transferable skills will support successful integration into the labour market following graduation (Muhamad, 2012).

Microcredentials are increasingly being explored within higher education (Sargent et al., 2023). Specifically, previous studies have identified the usefulness of microcredentials in advancing one’s knowledge following integration into the workforce (Sargent et al., 2023). However, there remains a gap in the study, use, and implementation of microcredentials within higher education (Che Amat et al., 2021). Research conducted by Yilik (2021) aimed to explore how university students view microcredentials within higher education; findings reveal two key factors influencing students’ experiences with microcredentials, including employability and accessibility (Yilik, 2021). That is, students have turned to microcredentials to appeal to future employers after determining that the knowledge acquired through traditional university courses is not accurately demonstrated within transcripts (Yilik, 2021). Additionally, participants in this study reveal that the theoretical nature of higher education has prompted students to seek applied knowledge pathways that are accessible through microcredentials (Yilik, 2021). Through an analysis of this study, it is evident that universities are well positioned to inform students of the benefits of microcredentials, as well as develop and implement evidence-based microcredentials that provide students with tangible records of transferable skills.

Currently, the field of microcredentials is being explored globally. Specifically, in countries such as the United States of America, France, the Netherlands, Australia, the United Kingdom, and Canada researchers are beginning to explore the use of microcredentials for skill development and test implementation (Presant, 2020). Within Canada, eCampusOntario has recently launched microcredential pilots that work to support university student learning (Gooch et al., 2022). These pilots were developed in collaboration with employers, universities, and other public agencies that are dedicated to the success of Ontarians (Gooch et al., 2022). Additionally, the global proliferation of Massive Online Open Courses (MOOCs) has caused individuals to obtain microcredentials to bolster their existing resumés (Godwin-Jones, 2014). Specifically, MOOCs refer to free or low-cost online courses that offer open access to educational content through web-based platforms (Baturay, 2015). Similar to accredited microcredentials, MOOCs are often structured with video lectures, reading materials, and interactive elements, allowing learners to engage with a wide variety of academic subjects (Baturay, 2015). MOOC platforms (e.g., Coursera, edX, Udacity, FutureLearn, etc.) have entered the environment of higher education and provide individuals with increased knowledge (Bralić & Divjak, 2018). However, the academic rigour and depth of participant engagement in MOOCs is being scrutinized (Baturay, 2015). Literature suggests that the overarching aim of MOOCs is to improve employability through the development of various skills (Sargent et al., 2023). However, microcredentials developed by MOOCs lack the formal accreditation inherent in traditional degrees, potentially prompting employer skepticism regarding a candidate’s qualifications. As such, the credibility of microcredentials may be enhanced when developed by esteemed universities or higher education institutions.

As a relatively new area of focus, literature concerning the emergence of microcredentials discusses the challenges associated with implementation (Varadarjan et al., 2023). That is, owing to significant variation within nomenclature, credit size, and accreditation pathways, the microcredential field is oftentimes hard to navigate (Brown et al., 2021). These complexities can lead to confusion among learners, educators, and employers regarding the value and recognition of microcredentials in the educational system and job market. As higher education institutions remain central to the development of microcredentials, researchers have identified the need for clear implementation pathways (Varadajan et al., 2023). Specifically, research conducted by Varadarjan and colleagues (2023), demonstrates that microcredentials may be deemed beneficial when they are able to connect with learners, address industry needs for employment, and follow government qualification frameworks. In this way, the article written by Varadarjan and colleagues (2023) reveals the importance of developing microcredentials in a way that is understood by learners, educators, and employers. The insights gleaned from the research provide a nuanced understanding of the potential barriers that may arise when seeking to implement a microcredential. Armed with this knowledge, the research can strategically plan and implement microcredentials, incorporating pre-emptive measures to effectively navigate and mitigate these challenges.

### *Labour Market Trends*

The current study aimed to address the evolving Canadian job market, which increasingly demands individuals to acquire new skills and develop existing competencies to remain relevant while competing for job opportunities (Lauder & Mayhew, 2020). Research shows that employers have moved toward skill-based hiring and have demonstrated increased interest in recruiting individuals who possess transferable skills (Henrich, 2016). Despite the strong employer demand for graduates with transferable skills, post-secondary institutions across Canada do not prioritize the development of these skills (Giammarco et al., 2021). Specifically, the current format of academic transcripts limits an employer’s understanding of potential candidates’ abilities as they effort to solely provide the grades that students have acquired in their studies (Robins et al., 2014). In this way, employers are left to extrapolate the skills that a candidate may possess based on insufficient information. As the labour market continues to move toward skill-based hiring strategies (Henrich, 2016), this study aimed to understand how universities can implement microcredentials effectively to ensure that students’ transferable skills are adequately recognized and communicated to employers.

Within the labour market, employers are beginning to demand evidence of competency for hiring and promotion purposes (Wright, 2023). As such, microcredentials are being increasingly recognized by employers as skills that set apart potential candidates (Gauthier, 2020). In a study conducted by Harvey and colleagues (2023), data was collected through interviews to understand employers’ perspectives of microcredentials. Specifically, Harvey and colleagues (2023) found that in addition to traditional academic credentials, microcredentials have distinct added values (i.e., trusted accreditation, specific job-related skills) when selecting candidates. Additionally, employers indicated a readiness to accept relevant microcredentials from trusted issuing bodies to bolster the quality and relevance of academic credentials (Harvey et al., 2023). As the labour market becomes increasingly competitive (Wright, 2023), the research conducted by Harvey and colleagues (2023) suggests that there is a growing space for microcredentials that serve to add value to traditional academic credentials. In this way, the study aimed to fill the gap through the development of microcredentials that can be leveraged by graduating students while entering the workforce.

### *Consortium of Universities for Global Health Domains*

The Consortium of Universities for Global Health (CUGH) is an influential organization that aims to support academic institutions engaged in addressing various GH issues (Consortium of Universities for Global Health (CUGH), 2024). Established in 2008, the CUGH has become a leading voice in GH education, fostering interdisciplinary collaboration, capacity building, and knowledge sharing (CUGH, 2024). As the world's largest academic GH organization, the CUGH has rapidly grown to include 190 institutional members from 31 nations and a network of over 30,000 individuals (CUGH, 2024). Initially focused on North American academic institutions, the CUGH has diversified to include a wide array of disciplines (e.g., public health, law, engineering) that truly reflect the study of GH (CUGH, 2024).

In 2017, the CUGH worked to develop the first edition of the *Global Health Competencies Toolkit*, defining competencies in GH education and professional development (Consortium of Universities for Global Health (CUGH) Competency Sub-Committee, 2018). The second edition has been revised to include teaching strategies and curricular content that support the development of educational programs within the field of GH (CUGH, 2018). The toolkit includes 11 domains, each representing a critical area of GH education (CUGH, 2018). The toolkit is designed to equip students and professionals with the necessary tools to address complex health issues in diverse settings (CUGH, 2018). Among the domains, the focus on international collaboration is particularly significant as it underscores the importance of working across cultures, disciplines, and borders to improve health outcomes globally.

# Conceptual Frameworks

## RE-AIM Framework

### *Background*

The RE-AIM framework is a prominent evaluation model to assess the implementation of public health interventions. Developed by Glasgow and colleagues in 1999, the RE-AIM framework remains as one of the most widely applied frameworks within implementation science (Glasgow et al., 2019). The RE-AIM framework is a planning and evaluation model centred around the notion that researchers, program planners, evaluators, and other key stakeholders must consciously assess a program’s essential elements in order to successfully implement effective public health interventions (Glasgow et al., 2019). Although the RE-AIM framework was initially conceptualized to improve public health and health behaviour research, the framework has recently been linked to educational applications (Holtrop et al., 2021). That is, scholars across various disciplines, have employed the RE-AIM framework when developing and assessing educational programs (Glasgow et al., 2019). It is evident that the framework’s wide application and frequent use will aid in the understanding of the current microcredential’s implementation and effectiveness.

The RE-AIM framework incorporates five dimensions: Reach, Effectiveness, Adoption, Implementation, and Maintenance to assess a program’s outcomes (Glasgow et al., 2019). Each dimension is applicable to the current study as they work to provide a comprehensive evaluation of the microcredential’s outcomes. The *Reach* dimension recognizes the individual level outcomes of program implementation and refers to the number of individuals who are willing to participate in a program or intervention and the reasons why or why not (Holtrop et al., 2021). In this study, the *Reach* dimension was used to analyze participant demographics and course enrollment data. The *Effectivenes*s dimension refers to the impact that a program or intervention has on participants and the extent to which it achieves the intended outcomes (Holtrop et al., 2021). The *Effectiveness* dimension was assessed by comparing the participant responses from both the enrollment and feedback surveys. The *Adoption* dimension occurs at both the individual and setting levels of an intervention (Holtrop et al., 2021). At the setting level, *Adoption* refers to the number of settings (e.g., university programs) that are willing to initiate a program and the reasons why (Holtrop et al., 2021). At the individual level, *Adoption* refers to the number of individuals who are willing to initiate a program (Holtrop et al., 2021). In this study, *Adoption* was examined at the individual level through a thematic analysis of the open-text responses on Avenue 2 Learn (A2L), the university’s Learning Management System (LMS) used to implement the microcredentials. The *Implementation* dimension refers to the fidelity of a program or intervention’s key functions or components as intended at the time the implementation; this dimension also includes adaptations made to the intervention (Holtrop et al., 2021). In the context of this study, *Implementation* was used to analyze back-end data from the university’s LMS, determining participant engagement. The *Maintenance* dimension has important impacts on both the individual and setting levels of a program or intervention; at the setting level, this dimension refers to the extent to which a program or intervention becomes integrated into the routine of organizational practices and policies (Holtrop et al., 2021). At the individual level, the *Maintenance* dimension refers to the long-term effects of the program or intervention after it is completed by the participant (Holtrop et al., 2021). In order to understand the *Maintenance* dimension at the individual level, this study analyzed open-text responses from the feedback survey. As such, the RE-AIM framework aids in the translation of research into practice by illuminating factors related to the implementation process. In this way, employing the RE-AIM framework may work to strengthen the evidence base for incorporating microcredentials that showcase an individual’s transferable skills within higher education settings.

### *Relevance to Study*

The RE-AIM framework provides an outline for researchers that aids in program evaluation, making it applicable to understanding how various factors may influence an educational program’s outcomes and effectiveness (Holtrop et al., 2021). Throughout previous research, the RE-AIM framework has been employed to evaluate many educational programs across various disciplines (Glasgow et al., 2019). Gisondi and colleagues (2023) conducted an evaluation of a MOOC guided by the dimensions of the RE-AIM framework to understand the impact of an online educational program for healthcare workers. The authors use of the RE-AIM framework and their subsequent findings suggest that the framework provides important measures that are well-aligned to evaluate other online courses similar to the microcredentials designed for the MSc GH program. In this way, the current study was able to utilize the work accomplished by Gisondi and colleagues (2023) to accurately evaluate the MSc GH microcredentials. Additionally, the RE-AIM framework has been widely applied to novel educational programs (Holtrop et al., 2021), making it applicable to the current study. Specifically, Yuan and colleagues (2021) employed all dimensions of the RE-AIM framework to evaluate a pilot cognitive health education program combined with psychosocial interventions (Yuan et al., 2021). Similar to the study conducted by Yuan and colleagues (2021), this study employed the RE-AIM dimensions to evaluate the pilot program within the GH program at McMaster University. Specifically, identifying and addressing barriers to adoption is essential to ensure the effectiveness and sustainability of microcredentials within higher education. Further, examining the various dimensions of the RE-AIM framework within this study helped to understand the overall impact and scalability of the microcredential program. That is, this study explored how the microcredential program influenced participant learning, its uptake by students, and its long-term viability in the curriculum. In the context of the current study, the RE-AIM framework served as a critical tool for evaluating not only participant outcomes but also the broader implementation processes and potential for future program expansion. As such, it is apparent that the RE-AIM framework provided relevant dimensions of exploration for evaluating the MSc GH microcredentials.

## The Implementation Outcomes Taxonomy: Feasibility

In 2010, Proctor and colleagues (2010) published an article entitled, “Outcomes for Implementation Research: Conceptual Distinctions, Measurement Challenges, and Research Agenda,” in which they proposed a working taxonomy of outcomes that aimed to understand the implementation process. The authors identified acceptability, adoption, appropriateness, feasibility, fidelity, implementation cost, penetration, and sustainability as eight distinct outcomes that indicate the successful implementation of an intervention. The work accomplished by Proctor and colleagues (2010), works to distinguish each implementation outcome from service and clinical outcomes, thus, providing a new way to conceptualize and evaluate successful implementation of interventions outside of clinical healthcare research. The taxonomy was established by conducting iterative literature reviews and discussions to identify common constructs within implementation research. Many of the outcomes that Proctor and colleagues (2010) identified overlap significantly with the dimensions of the RE-AIM framework, however, feasibility remains conceptually distinct and pertinent to the objectives of this study. Specifically, the authors define feasibility as the extent to which a new program can be successfully employed within a given setting (Proctor et al., 2010). The authors add that feasibility is often measured retrospectively acting as an explanation of an intervention’s success or failure. It is apparent that in many definitions, feasibility may imply an intervention’s appropriateness within a given setting (Proctor et al., 2010), however, appropriateness and feasibility remain separate outcomes. That is, the abundance of microcredential programs within higher education and the GH field suggest that the microcredentials are appropriate within this study’s setting. In the context of this study, feasibility was analyzed using a researcher time log to reflect the development and implementation periods. Integrating feasibility along with the RE-AIM framework will provide a comprehensive program evaluation of the MSc GH microcredentials.

# Chapter 3: Methods

## Research Setting

McMaster University, located in Hamilton, Ontario, Canada is one of Canada’s leading academic institutions, renowned for its innovative research, diverse academic programs, and commitment to student success (McMaster University, 2024b). Established in 1887, McMaster has become a comprehensive university that serves a diverse student population from across Canada and around the world (McMaster University, 2024b). Ranked 98th in Academic Rankings of World Universities (McMaster University, 2024b), McMaster presents characteristics that are pertinent to this study. Specifically, McMaster boasts a student population of over 32,000 and a strong international presence (McMaster University, 2024b), reflecting its global outlook and commitment to fostering a diverse academic community. Given McMaster’s diverse and geographically dispersed student body, there is a growing need to develop and expand online course offerings. That is, the geographic diversity of McMaster’s student population provides an opportunity for online courses, encouraging accessibility, inclusivity, and innovation. Online courses offer students the flexibility (Li, 2022) to engage with McMaster’s high-quality academic programs from anywhere in the world, thus extending the university’s reach and impact. Additionally, online education provides an opportunity for McMaster to cater to lifelong learners and working professionals seeking to upgrade their skills. Currently, through the department of Continuing Education, McMaster University offers 15 microcredentials spanning fields across business, health, technology, and professional development (McMaster University, 2024a). As McMaster continues to evolve in response to the changing landscape of higher education, the development and implementation of robust online courses are crucial to remain at the forefront of academic innovation, providing students with the tools they need to succeed in an increasingly interconnected world.

Currently, several graduate programs are offered at McMaster University, in various studies including health sciences, social sciences, and engineering. The graduate programs aim to equip students with the knowledge and skills necessary to address complex global challenges. In this context, the MSc GH program offers a valuable framework for this study to explore the implementation of microcredentials. The MSc GH program is interdisciplinary in nature and works to prepare graduates for careers in a globalized world (McMaster University, 2024c). The program combines in-person classroom experiences with online collaboration in virtual teams with students from the Netherlands, Norway, India, Colombia, Thailand, and Sudan (McMaster University, 2024c). Encompassing students who come from various academic disciplines, the program utilizes a range of online learning platforms and tools for course work and collaboration. The immersive learning environment fosters internationalization at home and abroad, building upon important career skills. Leveraging the power of digital technology, the program harnesses the expertise of instructors and industry leaders from diverse cultural backgrounds and geographical regions, enriching the learning experience with global perspectives and insights (McMaster University, 2024c). That is, as students in this program seek to pursue careers within a globalized sector of the labour market, the completion of microcredentials may prove to set them apart from other potential candidates. As the labour market increasingly looks to skill-based hiring (Wright, 2023), the integration of microcredentials in the MSc GH program offers students the opportunity to demonstrate the acquired transferable skills to future employers in a meaningful way.

## Study Design

This study included two phases:

* Phase 1 – Development and implementation of the microcredential in *International Collaboration*
* Phase 2 – Evaluation of the development, implementation, and effectiveness of the microcredential.

### *Phase 1 – Development and implementation of the microcredential in International Collaboration*

The development and implementation of the MSc GH *International Collaboration* microcredential involved a structured approach to ensure quality, relevance, and impact. The process began with a comprehensive design framework based on the CUGH GH competencies and other relevant GH literature. A thorough literature review was conducted to understand the gaps in skill demonstration and microcredential education, providing a basis for the microcredential’s outline and content. Following the literature review, a prototype of the *International Collaboration* microcredential was developed and analysed among the research team. Once the prototype was approved, all online materials (e.g., PowerPoint presentations, quizzes, lecture videos, case studies) were created and tested. Additionally, advertising materials (e.g., A2L announcement) were developed and broadcasted across various platforms to promote the microcredential program. Lastly, the microcredential program was disseminated on A2L for the MSc GH students and their participation was constantly monitored by the research team to facilitate a beneficial learning experience. The following section provides an in-depth overview of each step in the development and implementation phase of this project.

#### International Collaboration GH Microcredential Design. The International Collaboration microcredential, was designed to be integrated alongside the existing MSc GH course load and aimed to equip students with the skills and knowledge necessary to thrive in the global labor market. The included content was developed based on the CUGH GH competencies and other prominent research within the field of GH. The microcredential was presented in a self-guided manner, allowing participants to work through the information at their own pace (approximately 8 hours total). Drawing from education research and best practices within the field, each module was developed to blend theoretical knowledge with practical skills and experiential learning opportunities. Case studies were integrated throughout the microcredential, allowing students to apply concepts learned in lectures to real-world scenarios and develop practical experience in navigating the complexities of international collaboration. In bringing together a diverse cohort of students, leveraging online learning technologies, and integrating experiential learning opportunities, the program aimed to empowered learners to become effective collaborators, leaders, and agents of change in an increasingly globalized workforce.

The curriculum of the microcredential was structured to cover topics essential for successful international collaboration within the globalized workforce. Specifically, the microcredential content was divided into four modules that included virtual lectures and recorded interviews on topics surrounding a) inclusive partnerships, b) diplomacy and trust, c) shared learning, and d) collaborative leadership. The entirety of the microcredential program was delivered online, leveraging digital platforms and interactive technologies to facilitate engagement and participation regardless of geographical location. Through a combination of asynchronous lectures, immersive simulations, and assessments, students were engaged in a dynamic learning environment that mirrors the complexities of real-world international collaboration. The asynchronous nature of the microcredential allowed for flexibility, accommodating the diverse schedules and time zones of the student population. In the current microcredential program, students were required to follow the training modules and engage with the online platform to capture their skills. That is, in order to achieve a record of completion from the microcredential research team, students were required to satisfy completion metrics (i.e., 100% of topics visited, 100% of modules completed, 100% engagement with interactive elements (i.e., quizzes), and contribute to forum participation).

Literature Review. In the initial phase of microcredential development, a comprehensive review of both peer reviewed and grey literature regarding microcredential design and adult learning outcomes was conducted to establish a robust course structure and effective learning components. Additionally, relevant literature concerning international collaboration was explored to inform the course content. This review ensured that the course content reflected current trends and challenges within the field of GH.

Prototype Development. Following the literature review, an outline and prototype of the *International Collaboration* microcredential was developed to provide a clear framework for the course structure and content. The initial design incorporated key learning objectives, outcomes, and instructional strategies in alignment with the adult learning principles and international collaboration concepts outlined by the CUGH (2018). To ensure the program’s relevance and effectiveness, the prototype was reviewed in detail with staff and faculty from the GH program. This collaborative approach facilitated the integration of diverse perspectives, while refining the course components and ensuring the content met the needs of prospective participants (i.e., MSc GH students).

#### Content Creation. Once the outline and prototype were finalized, the next phase involved creating and procuring the course content, which included a variety of instructional materials such as PowerPoint presentations, lecture videos, case studies, and quizzes. Each component was designed to facilitate active learning and engagement. The PowerPoint presentations provided foundational knowledge, while videos offered dynamic explanations of key concepts. Case studies were developed to encourage critical thinking and practical application, enabling participants to analyze complex situations relevant to GH. Additionally, quizzes were integrated throughout the microcredential to assess understanding and reinforce the key concepts, allowing participants to gauge their progress and retention of the material.

#### Content Testing and Revision. Following the development of the course content, the next step of the process involved uploading all microcredential materials to McMaster’s LMS (i.e., A2L). This facilitated easy access for participants and provided a centralized platform for course delivery. To ensure a user-friendly experience, comprehensive user testing was conducted, allowing the research team to navigate the LMS and interact with course materials. As a result, the LMS content was revised to enhance usability and accessibility, ensuring that all participants could engage effectively with the course.

Advertising Materials. After ensuring that all course content was finalized and uploaded to the A2L platform, the next step involved creating and launching advertising materials to promote the microcredential program. Advertising materials included targeted email campaigns, LMS announcements, and presentation graphics to reach prospective participants (Appendix A). The advertising materials highlighted the key benefits of the program, including its focus on essential GH competencies and the opportunity for professional development. Once the materials were finalized, they were disseminated through various channels (i.e., emails, in person, A2L announcements) to ensure broad visibility and engagement with potential participants.

#### Dissemination. Following the launch of the advertising materials, efforts were directed toward recruiting participants to the microcredential program. The research team engaged with participants through informative presentations and email correspondence to provide insight into the program. These interactions worked to clarify questions and highlight the uniqueness of the microcredentials. Registration was streamlined through McMaster’s A2L platform.

#### Monitored Participation and Resolved User Issues. Once the microcredential began, regular assessments of participation metrics were conducted, including tracking module completion rates, forum contributions, and interaction with course materials. Additionally, a support mechanism was put in place, allowing participants to report any technical difficulties or concerns they encountered while navigating the course. Participants’ feedback was received through email and timely resolutions were provided, whether through direct assistance or updates to the course materials and the A2L platform.

### *Phase 2 – Multi method evaluation of the development, implementation, and effectiveness of the microcredential*

This study employed a concurrent multi method approach, incorporating both quantitative and qualitative data, to evaluate the development, implementation, and effectiveness of the GH microcredential program. The research aimed to assess the impact of the program on participants’ knowledge, skills, and engagement, as well as gather insights into the microcredential’s delivery and effectiveness from multiple perspectives. Specifically, the study integrated a combination of descriptive survey data, back-end LMS statistics, and reflexive data to provide an in-depth understanding of the program’s outcomes. The integration of quantitative and qualitative data enabled a more comprehensive evaluation of the microcredential program. That is, the survey results offered insights into changes in participant knowledge and skills, while the reflexive data and LMS metrics provided context regarding the microcredential’s implementation and participant engagement. Triangulation of these different data sources strengthened the validity of the study's findings and helped to identify both the strengths and potential areas for improvement in the program's design and delivery.

## Participants

Participant eligibility criteria included: (a) 18 years of age or older, (b) enrolled in the 2023 MSc GH cohort, (c) internet access, and (d) enrolled in one or both MSc GH microcredentials.

## Sampling and Recruitment

Participants were recruited using total population sampling. Total population sampling is a purposive sampling strategy that involves examining an entire population (Etikan et al., 2016). In the context of this study the population refers to the students in the MSc GH program at McMaster University in the 2023 cohort. Total population sampling was chosen as it is a particularly valuable method when a population is very small (Etikan et al., 2016), providing a practical and efficient way to obtain the preliminary information required for this proof-of-concept project. Due to parameters set by the Hamilton Integrated Research Ethics Board (HiREB), participants were not informed directly about the study. Rather, participants were notified about enrollment for upcoming microcredentials during the MSc GH Symposium. This notification occurred twice within the annual GH Symposium at McMaster University on April 26 and May 3, 2024 (Appendix A).

Upon enrollment in one of the microcredentials, students received an email inviting them to partake in the study (Appendix B). The recruitment email provided a link to a secure and confidential online consent form. Following their indication of interest in the study, participants were provided with an introductory statement that outlined the study’s purpose, procedures, and their rights (Appendix C). This recruitment procedure and study design were approved and in compliance with the university’s HiREB (#17366).

## Procedure

After providing informed consent, participants were directed to complete an enrollment survey (Appendix D) which included measures of demographics, experience (e.g., participation in prior microcredentials), and knowledge, skills, and confidence. Upon enrollment in the microcredentials, participants were able to access the microcredential program modules. Completion of the enrollment survey was not a prerequisite of the microcredential engagement. The feedback survey (Appendix E) was released on September 24 (approximately three months from when the microcredentials opened). The feedback survey included measures of change in the participants’ knowledge, skills, and confidence and their experience in and motivations for taking the microcredentials. Open-ended questions were also included in the feedback survey to gain additional qualitative insight into participants’ perceived use of the microcredentials and ways to improve participation. Participants who completed the microcredentials received a certificate of completion. All procedures were approved by the university’s HiREB (Appendix F).

Upon obtaining consent, participants were officially enrolled in the survey. The enrollment process included verifying eligibility criteria, confirming participant understanding of the survey requirements, and providing access to the survey platform. In order to capture a comprehensive understanding of any knowledge, skill, and confidence changes over time, all students enrolled in the microcredentials received links to both the enrollment and feedback surveys. Data collection was conducted through a structured online survey platform (i.e., RedCap), tailored to capture responses related to current understanding regarding transferable skills and microcredentials. The surveys employ a mix of closed- and open-ended questions to gather quantitative and qualitative data. Reminders were sent to participants at regular intervals to encourage timely and comprehensive results. All quantitative data was de-identified and stored on the study’s electronic file management system on a password protected computer on a secure network. Data was exported securely to statistical analysis software for analysis. The enrollment and feedback survey responses were aggregated and compared to allow for comprehensive analysis. Examining the aggregated data enabled meaningful conclusions about participant responses while minimizing potential privacy risks.

## Enrollment Survey Measures

### ***Demographics***

Participants answered questions regarding their age, gender, race, and level of education.

### ***Experience***

Participants answered questions regarding their past and current experiences in taking microcredentials. An example of the experience questions included: “Within the past two years, have you participated in any microcredential courses at a university?” Participants were asked to respond by indicating whether they had participated in a microcredential and, if yes, to describe their participation.

### *Knowledge, Skills, Confidence*

Knowledge was measured using 14 items asking participants to rate their perceived knowledge prior to engaging with the microcredentials. For example, “I have the knowledge needed to identify effective strategies for building and maintaining community partnerships in global health projects”.Participants rated their agreement to the various statements using a 5-point Likert scale (1 = “strongly disagree” - 5 = “strongly agree”).

Skills were measured with one item asking participants about their perceived abilities prior to engaging with the microcredentials. That is, participants rated their agreement to the statement “I have the skills needed to foster transparent and trustworthy relationships in global health collaborations” using a 5-point Likert scale (1 = “strongly disagree” - 5 = “strongly agree”).

Confidence was measured with one item asking participants about their perceived decision-making abilities prior to participating in the microcredentials. That is, “I am able to describe basic strategies involved in incisive decision-making for global health issues, such as asset-based community building and agenda setting and implementation” Participants responded using a 5-point Likert scale (1 = “strongly disagree” - 5 = “strongly agree”).

## Feedback Survey Measures

### ***Demographics***

Due to fact that the survey responses could not be linked to the participant, the feedback survey included the same questions as the enrollment survey regarding the participants’ age, gender, race, and level of education.

### ***Motivations***

Participants answered 1 question regarding their motivation for enrolling in the MSc GH microcredentials. For example: “What motivated you to enroll in the Global Health microcredential courses?” Participants were asked to respond by choosing one of the predetermined responses (i.e., career advancement, skill development, personal interest, stay updated in the field, or other).

### *Knowledge, Skills, Confidence*

Similar to the demographic data, participants were asked the same knowledge, skills, and confidence questions from the enrollment survey following their engagement in the microcredentials. This was done to investigate if a change in the participants’ knowledge, skills, and confidence could be identified. Participants who indicated that they did not engage with the microcredentials bypassed the knowledge, skills, confidence section of the feedback survey to prevent an overlap of data that would have resulted in skewed feedback.

### *Effectiveness*

Effectiveness was measured with 8 additional items asking participants who had engaged with the microcredentials to rate their agreement with items describing their experience. This section of the survey was divided into 4 collaboration questions and 4 incisive decision-making questions. For example, “After taking the international collaboration microcredential course, I have a better understanding about how to effectively collaborate with relevant international stakeholders from a global health perspective than I had before taking this course”. All items were responded to using a 5-point Likert scale (1 = “strongly disagree” – 5 “strongly agree”).

### *Qualitative Data*

Open-ended questions were used to gather additional insight into participants’ potential future application of the microcredentials and seeking recommendations for further enhancing the microcredentials. For example, “How do envision using the microcredential badges in future job applications?”.

## Reflexive Data

Throughout the development and implementation process of the *International Collaboration* microcredential, a time log tracking content development, dissemination, and correspondence was maintained to allow for reflexive data analysis following the microcredential’s completion. Specifically, the time log was recorded in a Microsoft Word document, date stamped, and complied into a database. The quantitative data provided insights into creative development, dissemination, and participant interaction.

## Learning Management System Data

### *Participation Statistics*

The study analyzed data from the LMS where the microcredentials were hosted. This data included quantitative metrics such as course completion rates, time spent on various modules, participant interaction with course materials, and discussion forum engagement. The data from LMS was downloaded and recorded into a Microsoft Excel document. These metrics aimed to provide an additional layer of understanding regarding participant behavior and engagement, helping to identify which aspects of the course were most, or least, effective. Through an analysis of the patterns identified from the LMS data, the study assessed whether participants who completed the course showed higher levels of interaction or engagement compared to those who did not engage with the course content. Additionally, this data highlighted which modules or topics may require further refinement or additional support to facilitate better learning outcomes in future iterations.

### *Discussion Forum Responses*

To complement the LMS quantitative statistics, participants’ discussion forum responses were pulled verbatim to allow for analysis. Participants had the opportunity to engage with three discussion forums within the *International Collaboration* microcredential. Each discussion forum completed a section of the microcredential and required the participants to read a case study and answer two application questions. The integration of the discussion forums intended to gather insight into the participants’ ability to apply of the microcredential material to real-world case studies.

# Chapter 4: Data Analysis

## Quantitative Data

Quantitative data from the enrollment and feedback surveys was analyzed using descriptive statistics, specifically focusing on mean scores as a summary of participant responses. Mean scores provide a concise representation of central tendencies within the data, allowing for a clear interpretation of overall trends in participant perceptions and experiences (Dugard & Todman, 2006). The quantitative data was screened for outliers; however, none were identified in the current dataset. The skewness was reviewed in order to identify if the dataset was normally distributed. Additionally, back-end LMS data and the researcher’s time log were analyzed using descriptive statistics. These datasets were compiled into tables to quantify student and researcher’s activities. These data will help to better understand *Reach*, *Effectiveness*, *Implementation*, and the feasibility outcome.

## Qualitative Data

Qualitative data from the feedback survey (i.e., open-text responses) and microcredential discussion forums were analyzed using Braun & Clarke’s (2006; 2012) process of thematic analysis. Open-ended survey responses and discussion forum responses underwent thematic analysis to identify recurring themes and patterns. The data was coded and categorized allowing for an in-depth understanding of participant’s perspectives. Specifically, Braun & Clarke’s (2006; 2012) process of thematic analysis involves six key steps; familiarization with the data, generating initial codes, searching for themes, reviewing, and refining themes, defining, and naming the themes, and finally producing a report that integrates the findings. Braun & Clarke’s (2006; 2012) process allows researchers to derive meaningful insights from complex data while ensuring a structured analysis. The thematic analysis of student responses to discussion board prompts was conducted through a realist lens. Realism ontology posits that reality exists independently of human perceptions and interpretations, emphasizing that the experiences and responses of students reflect an objective reality shaped by the educational environment (Albert et al., 2020). In this context, the discussion board posts were analysed as direct expressions of the students’ learning experiences and beliefs, reflecting a reality that exists beyond subjective interpretation. Employing positivism epistemology, which emphasizes objective knowledge gained through observation and measurement, the analysis sought to identify patterns and themes within the data that could be measured and validated (Park et al., 2020). The goal was to uncover observable trends in how students engaged with the course content, specifically focusing their knowledge and understanding of the key GH concepts addressed in the course modules. These data were used to help to better understand *Adoption* and *Maintenance*.

# Chapter 5: Results

## Reach

### *Course Enrollment Data*

As of September 22, 2024, a total of 28 MSc GH students were enrolled in the microcredential program, of whom 78.57% of participants engaged with some of the courses’ content. 17.86% (n=5) of the enrolled participants completed the microcredentials based on the predetermined completion metrics (identified in the GH Microcredential Design section). The remaining 82.14% of participants completed 0-99% of the microcredentials but did not receive a record of completion (see Table 1).

**Table 1**

*Course Enrollment Data*

|  |  |  |
| --- | --- | --- |
| **Engagement** | **Enrolled Participants (n=28)** | |
|  | No. | % |
| Did not engage | 6 | 21.43% |
| Engaged | 17 | 60.71% |
| Completed | 5 | 17.86% |

### *Demographics*

Of the 28 participants that enrolled in the microcredential courses, 16 completed the enrollment survey prior to engaging with the course content. The majority of enrollment survey participants were female (87.5%) and had completed a master’s degree (62.5%). An equal number of participants (43.75%) belonged to age groups between 18 and 24 years, and between 25 and 34 years. Just under one third of participants (i.e., 31.25%) identified as belonging to a racialized group. Most participants reported that they have not previously participated in any other microcredentials at the university level (80.0%). 57.9% indicated that they enrolled in the microcredential program to improve employability and career advancement. Only 8 participants completed the feedback survey, reflecting an attrition rate of 50% from the enrollment survey.

**Table 2**

*Demographic Survey Data*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Enrollment Survey N= 16** |  | **Feedback Survey N= 8** |  |
|  | No. | % | No. | % |
| **Gender** |  |  |  |  |
| Male | 2 | 12.5% | 1 | 12.5% |
| Female | 14 | 87.5% | 7 | 87.5% |
| Intersex | 0 | 0.00% | 0 | 0.00% |
| Transgender | 0 | 0.00% | 0 | 0.00% |
| Two-Spirit | 0 | 0.00% | 0 | 0.00% |
| Non-binary | 0 | 0.00% | 0 | 0.00% |
| Other | 0 | 0.00% | 0 | 0.00% |
| **Age (years)** |  |  |  |  |
| 18 – 24 | 7 | 43.75% | 3 | 37.50% |
| 25 – 34 | 7 | 43.75% | 3 | 37.50% |
| 35 – 44 | 0 | 0.00% | 1 | 12.50% |
| 45 – 54 | 0 | 0.00% | 0 | 0.00% |
| 55 – 64 | 0 | 0.00% | 1 | 12.50% |
| 65+ | 2 | 9.50% | 0 | 0.00% |
| **Education** |  |  |  |  |
| Bachelor’s Degree | 6 | 37.50% | 3 | 37.50% |
| Master’s Degree | 10 | 62.50% | 5 | 62.50% |
| Doctoral Degree | 0 | 0.00% | 0 | 0.00% |
| Professional Degree | 0 | 0.00% | 0 | 0.00% |
| **Race** |  |  |  |  |
| Racialized Group | 5 | 31.25% | 3 | 37.5% |
| Indigenous | 0 | 0.00% | 0 | 0.00% |

## Effectiveness

### *Enrollment and Feedback Survey Comparison*

Table 2 presents the descriptive statistics for questions measuring knowledge, skills, and confidence that were asked in the enrollment and feedback surveys.

**Table 3**

*Knowledge, Skills, Confidence Survey Comparison*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **N** | **Range** | **Minimum** | **Maximum** | **Mean** | **Standard Deviation** |
| **Enrollment Survey** |  |  |  |  |  |  |
| Knowledge | 16 | 2.36 | 2.64 | 5 | 3.62 | 0.69 |
| Skills | 16 | 2 | 3 | 5 | 4 | 0.63 |
| Confidence | 15 | 3 | 2 | 5 | 3.53 | 0.99 |
| **Feedback Survey** |  |  |  |  |  |  |
| Knowledge | 2 | 1 | 3 | 4 | 3.5 | 0.71 |
| Skills | 2 | 1 | 3 | 4 | 3.5 | 0.71 |
| Confidence | 2 | 1 | 3 | 4 | 3.5 | 0.71 |

In the feedback survey, participants were presented with 16 of the same questions from the enrollment survey. These questions provided insight into the changes of participants’ (n=2) perspectives related to their knowledge, skills, and confidence. Below is a clustered bar graph showing the mean scores for participants’ knowledge, skills, and confidence at the enrollment and feedback survey timeframes.

**Figure 1**

*Changes to Knowledge, Skills, and Confidence*

### *Feedback Survey*

Knowledge, Skills, Confidence. Two additional skills questions were asked in the feedback survey. These questions provided insight into participants’ (n=2) perspectives related to skill demonstration and acquisition. The bar graph below represents the mean scores for participants’ skills at the feedback survey timeframe.

**Figure 2**

*Skills Mean Scores*

The feedback survey included an additional knowledge question to gather participants’ perspectives related to knowledge consolidation. The bar graph below represents the mean scores for the participants’ (n=2) knowledge at the feedback survey timeframe.

**Figure 3**

*Knowledge Mean Score*

An additional confidence question was asked in the feedback survey. The question provided insight into participants’ (n=2) perspectives related to confidence in collaborative relationships. The bar graph below represents the mean scores for participants’ confidence at the feedback survey timeframe.

**Figure 4**

*Confidence Mean Score*

Four questions related to collaboration were asked in the feedback survey. These questions provided insight into participants’ (n=2) perspectives related to international collaboration. The bar graph below represents the mean scores for participants’ collaboration at the feedback survey timeframe.

**Figure 5**

*Collaboration Mean Scores*

Effectiveness. Four additional skills questions were asked in the feedback survey. These questions provided insight into participants’ (n=2) perspectives related to ethics, leadership practices, and collaborative skills. The bar chart below represents the mean scores for participants’ incisive decision-making skills, confidence, and knowledge at the feedback survey timeframe.

**Figure 6**

*Incisive Decision-Making Mean Scores*

## Adoption

### *Thematic Analysis of Open-Text Reponses*

As part of the microcredential completion, participants were required to complete various forum discussions throughout the modules. Employing Braun & Clarke’s (2006; 2012) process of thematic analysis, recurring themes were identified including community engagement, trust and capacity building, and open communication. These themes broadly reflected the changes in participants’ knowledge and skills that resulted from participating in the course.

Community Engagement.As part of completion of the first module, participants were asked to review a case study and were provided with guided questions to demonstrate their knowledge. This exercise was employed to assess the knowledge and insights participants were acquiring from the course modules. Based on participant’s answers (n=12), community engagement emerged as a recurring theme. More specifically, the thematic analysis revealed that community engagement is often context specific and that using culturally relevant resources was a supportive means of preventative medicine.

Trust and Capacity Building. Similar to the first module, the discussion forum following the second module asked participants to review a case study regarding collaborative partnerships. Participants were then asked to respond to guided questions that tested their ability to build trust and foster sustainable relationships with local communities. As a result, participants (n=11) were able to identify the importance of culturally adaptive and community centered approaches, and constant communication with local leaders, health providers, and community members.

Communication.Following the third module, participants (n=9) were tasked with applying the Canadian Interprofessional Health Collaborative (CIHC) framework to a case study using guided questions. This discussion forum was employed to test how accurately students could apply relevant GH frameworks to a real-world scenario. The participants were able to identify and explain the significance of clearly defined roles and responsibilities within interprofessional teams and the role that open communication plays in enhancing collaboration and ensuring effective healthcare delivery.

## Implementation

The average time spent within the LMS course by participants was 2.67 hours, including individuals who did not spend any time engaging with the course contents. After removing the individuals who did not engage with the course offerings, the average time spent changed to 3.40 hours, a difference of 0.73 hours (i.e., 43.8 minutes). Individuals who completed the microcredential (n=5), spent, on average 7.12 hours within the course. Across all participants enrolled in the microcredentials (n=28), the average amount of visits made to the course was 26.5. The average amount of modules completed among the individuals who engaged in some of the course (n=22) content is 51%. Of the individuals who engaged with some of the course content (n=22), 45% participated in forum discussion. Table 3 provides a comprehensive breakdown of each participant’s total time spent within the microcredential program on the LMS, how many topics they visited, how many visits they made to the microcredential program, the percentage of modules they completed, if they interacted with the quizzes, and if they participated in the discussion forums.

**Table 4**

*GH Microcredential LMS Data*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Participant** | **Total Time Spent (hrs:mins:secs)** | **Topics Visited** | **Total Visits** | **Percentage of Modules Completed** | **Engagement with Interactive Elements** | **Forum Participation** |
| 1 | 0:5:12 | 2/32 | 4 | 6% | 1/8 | No |
| 2 | 10:13:45 | 32/32 | 56 | 100% | 8/8 | Yes |
| 3 | 0:59:24 | 32/32 | 36 | 100% | 8/8 | Yes |
| 4 | 0:00:00 | 0/32 | 0 | 0% | 0/8 | No |
| 5 | 7:21:21 | 32/32 | 73 | 100% | 8/8 | Yes |
| 6 | 0:00:00 | 0/32 | 0 | 0% | 0/8 | No |
| 7 | 14:47:20 | 32/32 | 113 | 100% | 8/8 | Yes |
| 8 | 2:25:57 | 30/32 | 53 | 88% | 8/8 | Yes |
| 9 | 0:00:00 | 0/32 | 0 | 0% | 0/8 | No |
| 10 | 13:50:00 | 32/32 | 77 | 78% | 8/8 | No |
| 11 | 0:25:18 | 4/32 | 5 | 9% | 1/8 | No |
| 12 | 0:00:00 | 0/32 | 0 | 0% | 0/8 | No |
| 13 | 5:34:37 | 27/32 | 51 | 78% | 8/8 | No |
| 14 | 0:00:00 | 0/32 | 0 | 0% | 0/8 | No |
| 15 | 0:05:53 | 2/32 | 2 | 6% | 0/8 | No |
| 16 | 0:03:14 | 19/32 | 26 | 59% | 8/8 | No |
| 17 | 0:03:21 | 2/32 | 3 | 3% | 0/8 | No |
| 18 | 0:10:30 | 10/32 | 16 | 34% | 4/8 | Yes |
| 19 | 0:57:13 | 1/32 | 1 | 3% | 0/8 | No |
| 20 | 0:34:09 | 2/32 | 2 | 6% | 0/8 | No |
| 21 | 2:14:42 | 32/32 | 101 | 100% | 8/8 | Yes |
| 22 | 0:00:43 | 1/32 | 1 | 3% | 0/8 | No |
| 23 | 8:30:40 | 24/32 | 32 | 72% | 6/8 | Yes |
| 24 | 0:01:13 | 4/32 | 5 | 9% | 0/8 | No |
| 25 | 3:00:02 | 31/32 | 53 | 91% | 8/8 | Yes |
| 26 | 3:01:55 | 20/32 | 23 | 63% | 5/8 | Yes |
| 27 | 0:00:00 | 0/32 | 0 | 0% | 0/8 | No |
| 28 | 0:22:33 | 8/32 | 9 | 19% | 2 | No |

## Maintenance

### *Feedback Survey: Open-Text Reponses*

As part of the feedback survey, participants were asked to provide their insights to two open-ended questions. Employing Braun & Clarke’s (2006; 2012) process of thematic analysis, recurring themes were identified that broadly reflected the participants’ application of GH concepts following the microcredential courses.

Participants were asked “How do you envision using the Global Health microcredentials you have obtained in future job applications?” This question was posed to understand how participants perceive the value and applicability of the microcredentials in advancing their career prospects. Based on participants answers, the ability to demonstrate their specialized knowledge and skills emerged as a recurring theme. More specifically, the thematic analysis revealed that participants would showcase their microcredential achievements on their resumés as a means of appealing to the needs of future employers. Specifically, one participant noted that they envision using the GH microcredentials on their resumé to “open up more career options”.

Subsequently, participants were asked “What other transferable skills do you think future iterations of the Global Health microcredentials should address?” This question aimed to gather insight into participants expectations and perceived gaps in the current curriculum. Based on the participants’ answers, the acquisition of field related skills emerged as a recurring theme. Specifically, participants revealed that future iterations of the GH microcredentials may benefit other individuals by incorporating skills and tools that are required within the workplace. That is, participants noted, “policy analysis and grant writing” as potential topics for future iterations of the GH microcredntials.

### *Feedback Survey: Motivations and Future Recommendations*

In the feedback survey participants were asked “What factors would encourage you to participate in future iterations of the Global Health microcredential courses? Please select all that apply.” to understand how to improve future microcredentials and increase participation. Of the participants who answered this questions (n= 8), 50% indicated that specific career benefits would encourage future participation. Additionally, 37.3% indicated that increased interaction with others in the courses would increase participation. See figure 7 below for a comprehensive breakdown of participant responses.

**Figure 7**

*Motivations*

## Feasibility

### *Reflexive Data*

As part of measuring the impact of the MSc GH microcredential program, data was collected regarding the time invested throughout various stages of the implementation process. Specifically, three categories of data were collected including hours dedicated to module development (Table 4), hours spent disseminating program information to potential participants (Table 5), and hours spent corresponding with participants (Table 6). The cumulative time spent across all categories amounted to 88.5 hours. Of note, time spent researching subjects relevant to the overarching microcredential topics was the most extensive at 30 hours (33.89%). Additionally, creative development and module recording consumed a large portion of the development process at a combined 28.25% of the total time spent on development.

**Table 5**

*Module Development*

|  |  |  |
| --- | --- | --- |
| **Items** | **Description** | **Metric (Hrs.)** |
| Research and Content Development | Research for the International Collaboration microcredential was conducted to understand the current landscape of microcredentials and subsequent module topics (e.g., community engagement, collaborative partnerships, etc.). Content was developed from existing field research. | 30 |
| Creative Development | Once all research was collected, findings were inputted into presentation format. | 10 |
| Recording | All modules within the International Collaboration micredential were recorded using the Movavi video editing software. | 15 |
| Interviews | A round table discussion with GH PhD students was conducted to understand their perspectives while working and conducting research within the field. Three interviews with health professionals were conducted to gain insight into the realm of Global Health and provide students with real world experience. | 6 |
| Quiz Development | 4 quizzes were developed for the international collaboration microcredential. Quizzes consisted of multiple choice and true and false questions. Each participant was given three attempts per quiz. | 8 |
| Discussion Development | 3 discussion forums were developed. Discussions consisted of case studies and reflection questions based on various module content. Resources for case studies were analysed and included to provide participants with real world scenarios that they may encounter in future careers. | 6 |
| Editing | All module recordings were edited to ensure quality. | 5 |
| Adjustments to Course | Course adjustments were made following a review from the research team. Additional adjustments were made upon participant’s request for increased attempts for quizzes. | 2 |

**Table 6**

*Dissemination Channels*

|  |  |  |
| --- | --- | --- |
| **Items** | **Description** | **Metric (Hrs.)** |
| Symposium Presentations | Microcredentials were introduced to the MSc GH cohort at the 2023 Global Health Symposium at McMaster University. Two presentations occurred consisting of a promotional infographic and QR code for students to indicate their interest in enrollment. Additionally, the research team answered questions from the audience. 90 students were in attendance. | 1 |
| Initial Email Development | MSc GH students from the 2023 cohort received an initial email from the GH department’s Academic Program Advisor. This email informed students of the microcredentials’ benefits, components, and potential risks and included a detailed information letter. | 2 |
| A2L Announcement Development | An announcement on the Global Health A2L (Appendix G) main page was created to remind students of the microcredentials’ availability. The announcement was reviewed and approved by the MSc GH’s Academic Program Advisor. This announcement informed students of the microcredentials’ benefits, components, and potential risks. | 1 |

**Table 7**

*Participant Interaction*

|  |  |  |
| --- | --- | --- |
| **Items** | **Description** | **Metric (Hrs.)** |
| Follow-Up Email Development | Participants of the MSc GH microcredentials were sent 6 follow-up emails. The emails reminded students to engage with the microcredential content and the time left for completion. | 1.5 |
| Correspondence Emails | Participants reached out if they incurred any issues with the microcredential modules, quizzes, or discussion forums. A total of 15 correspondence emails were sent out. | 1 |

# Chapter 6: Discussion of Findings

This study sought to a) determine the factors that contribute to the successful implementation of microcredentials within the MSc GH program at McMaster University and b) understand the extent to which microcredentials encouraged professional development among graduate students. Initially, a literature review prompted an exploration into key competencies relevant to the field of GH and the use of microcredentials within higher education. Based on the findings of this review, the microcredential program was designed, implemented, and evaluated within the MSc GH program at McMaster University. Through the application of the RE-AIM framework and feasibility outcome from the Implementation Outcome Taxonomy, this study was designed to enhance learners’ knowledge in relevant GH competencies (i.e., international collaboration and incisive decision-making) and provide a foundation for further applications of microcredentials. The following section explores the key findings of this study.

## Reach

As a part of the RE-AIM framework, *Reach* is a measurement of participation referring to the percentage of participants who access or are influenced by a program (Glasgow et al., 1999). In this study, the *Reach* of the MSc GH microcredential program was determined by analysing participant enrollment and completion rates, along with demographic data. These data provided insight into the influence of the MSc GH microcredential program in meeting the needs of diverse learners. Although this proof-of-concept study had a low enrollment rate by the target population (i.e., 28 out of 103 (27.18%) MSc GH students in the 2023 cohort), the degree to which participants engaged with the course content remains promising for the program’s integration into the broader curriculum. Specifically, the results of this study indicated a 17.80% completion rate, representing the number of students who visited and completed all modules, engaged with all interactive elements, and contributed to discussion forums. Despite low initial enrollment, the completion rates remain high compared to studies of similar nature (Gomez-Zenmar & Alman de la Garza, 2016). That is, existing studies concerning the efficiency rates of MOOCs within higher education report completion rates between 8 and 10% (Gomez-Zenmar & Alman de la Garza, 2016; Harrison, 2013; Lushnikova et al., 2012). The comparatively high completion rates may suggest that the MSc GH microcredential program was embraced by the students who chose to enroll. As such, this may denote that the program participants valued the content and perceived the beneficial outcomes of the microcredentials. Thus, the positive engagement and completion rates underscore the potential of the MSc GH microcredential program to build upon student’s academic knowledge, facilitating the development of a holistic set of competencies and affirming its relevance and value as a viable model for transferable skill development in the field.

The analysis of the participant demographics found that the majority (87.5%) of participants who engaged with or completed the microcredentials identified as female. This data reflects the broader demographic makeup of the academic community (Statista, 2024). There tends to be a greater female presence in higher education. While the demographics of higher education indicate a greater female population (i.e., in 2021 1.2 million women were enrolled in postsecondary education compared to 931,220 men; Statista, 2024), the researcher acknowledges that the current participant pool is highly skewed female. Further, literature has identified that gender differences remain prevalent to the learning process (Gonzàlez-Gómez et al., 2012). Namely, differences in the aptitudes of students, dependent on gender, may be integral to supporting equal enrollment and engagement among male and female students. In a study conducted by Gonzàlez-Gómez and colleagues (2012), results revealed that female students experience greater degrees of satisfaction compared to male students in the realm of e-learning. The authors identify that preferential learning differences related to teaching methods and learning tools may lead to lower satisfaction and enrollment among male students (Gonzàlez-Gómez et al., 2012). Of note, the pace and presentation of the course content remain important to male student satisfaction (Gonzàlez-Gómez et al., 2012). In this way, it may be prudent to suggest that the presentation of the MSc GH microcredentials did not satisfy the learning needs of the male students in the 2023 cohort. Although the demographic data within this study remains congruent with comparative literature, it remains integral to understand the diverse learning needs and preferences of all learners in order to develop microcredentials that support equitable learning opportunities. As such, providing learners with the opportunity to voice their learning needs prior to microcredential development may be beneficial to future scale-up models. It is evident that fostering inclusivity in the development process may enhance the adaptability and influence of the microcredentials to ensure these learning opportunities meet the varied needs of all learners and contribute to an equitable learning environment.

## Effectiveness

*Effectiveness* refers to the impact of an intervention on individual outcomes (Ory et al., 2020). In order to understand the *Effectiveness* of the MSc GH microcredentials, a pre- post-test design was employed in the form of enrollment and feedback surveys. The questions in these surveys aimed to assess the impact of the microcredentials on the program participants’ knowledge, skills, and confidence in relation to key GH competencies. However, the limited number of participants (n=2) completing both assessments precludes the identification of statistically significant changes in the data. While pre-post scores could not be evaluated, enrollment and feedback survey data will be discussed separately. Mean scores for the enrollment survey were obtained and reflected high baseline values of knowledge (M=3.62 SD=0.69, N=16), skills (M=4, SD=0.63, N=16), and confidence (M=3.53, SD=0.99, N=15) among participants. The high baseline measures may suggest a ceiling effect in which a majority of the participants’ responses were close to the upper limit on the Likert scale (i.e., 5 – strongly agree; Chyung et al., 2020) prior to engaging with the microcredentials. As a result of the ceiling effect, it is difficult to obtain a true measure of the effectiveness of the microcredentials when attempting to identify improvements in learners’ knowledge, skills, and confidence. While Figures 2-4 show high levels of knowledge, skills, and confidence among participants, this may not be indicative of the effectiveness of the microcredentials, particularly since participants demonstrated high baseline levels prior to engaging with the microcredential program. When baseline knowledge, skill, and confidence begin at elevated levels, the potential for measurable improvement is limited, subsequently displaying that a program has minimal impact on participants. In order to accurately assess a program’s effectiveness, it is important to also consider qualitative feedback from participants alongside the pre- post-test data. Additionally, the lack of theoretical frameworks guiding module development may have compounded the ceiling effect as the absence of an underpinning structure (e.g., competency-based education; CBE) limited the ability to systematically assess and interpret changes in the learners’ knowledge, skills, and confidence. Through aligning program objectives with clearly defined competencies, these programs establish precise benchmarks for assessing learners’ progress (Bosch & Spinath, 2023). That is, educational programs that employ CBE philosophies throughout the development phase are able to more accurately determine the changes in learners’ outcomes following implementation (Bosch & Spinath, 2023). In this way, determining program objectives within early development stages may work to provide a roadmap for both instructors and learners that ensures all content, activities, and assessments, align with the desired course outcomes. This alignment will work to ensure the efficient use of resources, minimize gaps in content, and increase a program’s effectiveness.

Despite the limitations in the pre- post-test data, responses to the additional questions in the post-test phase (i.e., feedback survey) suggest that learners perceived improvements in their collaboration and incisive decision-making skills following engagement in the microcredentials (see Figures 5 and 6). This is in alignment with studies that indicate when learners report perceived growth it suggests that course content and delivery methods have successfully translated theoretical knowledge into practical application (Silander & Stigmar, 2020). In fields such as GH where adaptability and continuous skill development are essential (Sun et al., 2024), these self-reported changes highlight the importance of the integration of the microcredential program into the broader MSc GH curriculum. Additionally, this data highlights the potential for long term impacts as individuals integrate these skills into professional contexts. In this way, when assessed alongside quantitative data, perceived skill gain provides valuable insight into learner satisfaction, complementing objective measures of effectiveness.

## Adoption

At the individual level, the *Adoption* dimension refers to the percentage of individuals who are willing to embrace a program’s offerings and demonstrate learning outcomes (Holtrop et al., 2021). Without the ability to quantify *Adoption* at the setting level, this study approached the adoption dimension by analysing the discussion forums embedded within the MSc GH microcredential program. Globally, participation in discussion forums has been found to improve adoption (Cheung & Lee, 2007). Many studies have suggested that the use of online asynchronous discussion forums engages students and improves performance by developing knowledge construction and critical thinking skills (Al-Husban, 2020; Gerosa et al., 2010; Richardson & Ice, 2010). In this way, when participants are presented with an opportunity to reflect upon and demonstrate their learnings, they develop a deeper understanding of the course material which may result in the increased possibility of adopting the program’s offerings into practice. The results of this study indicate that over one third of program participants (35.71%) demonstrated active engagement through participation in the discussion boards. The thematic analysis of participants’ open-text responses identified that the learners were able to meaningfully adopt and apply course concepts to GH related case studies. Specifically, learners were able to accurately apply recurring themes (i.e., community engagement, trust and capacity building, and communication) amongst their contributions to the discussion forums in a way that demonstrated a strong consideration of and connection to the course content. Moreover, these themes remain central to GH ethics, a field that seeks to understand the values that influence health decisions and policy (World Health Organization, 2015). Seethamraju (2014) identifies that discussion forums within higher education environments provide students with the opportunity to develop deeper understanding of content-based issues. Accordingly, the themes listed above demonstrate that the participants were able to identify relevant ethical issues pertinent to the GH field including a) the importance of culturally relevant programs that align with a community’s needs and values, b) that sustainable change requires active support and respect for local knowledge, and c) that clear and consistent communication is essential for overcoming contextual barriers that arise within partnerships. In this way, the discussion forums allowed participants to reflect upon and apply ethical frameworks to diverse conflicts and devise equitable solutions. It is apparent that through exposing participants to real-world scenarios prior to entering the workforce, the integration of discussion forums may provide leaners with an opportunity to adopt relevant field related competencies and adapt quickly to diverse environments.

In addition to learner’s identification and application of course content, the participants’ continued return to A2L may further indicate successful adoption of the online learning setting and the microcredentials among the student population. Specifically, previous studies have identified that learner engagement directly effects a participant’s learning persistence and adoption of a course (Jung & Lee, 2018). In this way, the continued engagement across the discussion forums, and the microcredential program more broadly, suggests that students have successfully adopted the online learning setting, making it a promising platform for the continuation of microcredential courses. Thus, it is recommended to ensure that microcredentials are built with the inclusion of discussion forums so that learners are able to engage deeply with the course material, fostering an environment that enhances knowledge retention and leads to adoption.

## Implementation

*Implementation* refers to the extent to which a program is delivered in accordance with its original plans (Glasgow et al., 1999). In order to comprehensively evaluate *Implementation*, scholars identify the importance of fidelity (Carroll et al., 2007). Specifically, implementation fidelity refers to the degree to which a program is implemented as originally intended and is widely recognized as a key determination of successful implementation (Carroll et al., 2007). In this study, back-end LMS data including module completion rates, duration of time spent on the modules, and participants’ engagement with the interactive elements (i.e., quizzes and discussion forums) were used to evaluate the MSc GH microcredential’s implementation fidelity. Particularly, the time participants spent on completion was a strong indicator of the MSc GH microcredential program’s fidelity to the original plans. That is, at the project’s outset, the research team aimed to develop a program that took participants approximately 6 to 8 hours to complete. This completion time frame was chosen because it is in alignment with microcredentials of similar scope (Fanshawe College, 2024). Reflecting upon the results of the completion time frame of this study (i.e., average time of completion = 7.12 hours), it is apparent that the research team was able to achieve high fidelity to the original plans. Additionally, participant responsiveness has been identified as an important indicator of implementation fidelity (Carroll et al. 2007). Namely, the uptake of an intervention is dependent on the acceptance of those participating (Carroll et al., 2007). When analysing participant engagement with the interactive elements, it is evident that the participants remained engaged with the quizzes and responsive to the discussion forums (i.e., 45% of enrolled participants engaged with discussion forums; see Table 2). Through achieving high fidelity and sustained learner engagement throughout the program’s implementation, the results of this study demonstrate the credibility and utility of the microcredentials in the MSc GH program. As such, these findings suggest that the microcredentials can be integrated as a valuable tool in the MSc GH program to enhance participant learning outcomes and engagement with core GH competencies.

## Maintenance

The *Maintenance* dimension refers to the long-term effects of a program following participant completion (Holtrop et al., 2021), however, literature concerning the application of the RE-AIM framework commonly identifies *Maintenance* as the most challenging dimension to assess (Ory et al., 2020). That is, largely due to a lack of long-term data, the evaluation of maintenance poses an issue for many researchers (Ory et al., 2020). As this study was restricted by time constraints, *Maintenance* was measured using participants’ responses to open text questions imbedded in the feedback survey (e.g., “How do envision using the Global Health microcredentials you have obtained in future job applications?”). This method aimed to gather the participants’ perceptions of the long-term effects of the microcredential program to inform ways in which future iterations may attract potential learners. Participant responses to the open-text survey questions revealed that the microcredential will be used as a means to attract employers and boost resume skill sets (see Figure 7); thus, reflecting the perceived value and sustained application of the microcredentials over time in supporting the participants professional goals. Specifically, perceived use reflects the participant's belief in the lasting relevance and applicability of the skills they have gained (Poduval et al., 2020). The perception of the various uses of the GH microcredentials may denote an aspect of sustainability as the participants may be more likely to promote and continue to develop the skills they view as valuable (Poduval et al., 2020). The findings of this study remain encouraging as they suggest that the program is not only meeting its immediate educational objectives but also demonstrates potential long-term value for graduate students. Thus, the connection that participants were able to identify between the microcredentials and employability signifies the program's alignment with current labour market demands, strengthening its opportunity for integration into the broader curriculum.

## Feasibility

Literature on course evaluation and implementation underscores that a program success is often closely linked to its feasibility (Gadke et al., 2021). Within the Implementation Outcome Taxonomy, feasibility refers to the extent to which a new program can be successfully employed within a given setting (Proctor et al., 2010). This study analyzed researcher time logs to evaluate whether the integration of the microcredentials into the broader curriculum would be achievable with limited resources. The time logs from the study were divided into three categories (i.e., module development, dissemination channels, and participant interaction; see Tables 3-5) providing insight into the distribution of effort across different phases. Specifically, 92.65% of time was allocated to module development, 4.52% to dissemination channels, and 2.82% to participant engagement and troubleshooting. Notably, this microcredential was delivered and implemented without a budget, underscoring its feasibility, and suggesting its application in creating similar courses quickly and effectively. Tracking the time spent on each component of the MSc GH microcredential development and implementation process was essential to measure feasibility and informing future scale-up opportunities within the MSc GH program. As highlighted by Shearer and colleagues (2019), understanding the full range of design and development costs is difficult and requires long-term tracking of hours and expenses to build accurate budget forecasts. Through recording the dedicated hours and components required throughout each phase of the project, this study worked to provide a foundational estimate of the time investment required to build and maintain microcredentials. In this way, the MSc GH program can utilize these findings to estimate the professional costs for the creation of future microcredentials. In practice, accurate time tracking allows for a reliable model of anticipated costs (Shearer et al., 2019), aiding the MSc GH program to make informed decisions on budget allocations, design features, and technological inclusions based on financial feasibility. Thus, this approach provides a scalable, resource efficient framework that could be adapted to future offerings allowing the GH program to expand access to relevant training without requiring extensive development times or budget.

## Limitations

While this study shows significant promise as a means to enhance the learning experience and development of transferable skills, the researcher would be remis not to mention the limitations. Specifically, time constraints and the MSc GH program schedule limited the ability to encourage enrollment and participation in the microcredentials. That is, based on the time spent obtaining ethical approval and developing the microcredential, students within the MSc GH program were completing course requirements and moving into internship positions outside of McMaster University. This resulted in difficulties regarding the dissemination of the microcredential information and enrollment process. For these reasons, the findings of this study are based on a small population which may influence the generalizability of the results. Additionally, the limited scope of the project resulted in the inability to test the adoption and maintenance dimensions of the microcredential program at the setting level. Specifically, this study was unable to evaluate the long-term impacts of the microcredential program. While the short-term outcomes have provided valuable insights regarding the microcredential’s success, the program’s sustainability and integration into the broader curriculum remain uncertain. This lack of data brought about challenges in evaluating the program’s broader impact within the MSc GH program and the McMaster community. Although this study saw positive results among the adoption and maintenance dimensions at the individual level, the study cannot accurately assume the microcredential program’s sustained impact within the MSc GH program and the McMaster community. However, the cumulative results across the other RE-AIM dimensions and feasibility outcome continue to suggest that the microcredentials present a strong opportunity for graduate students pending their integration into the MSc GH program. Further, the homogeneity of the sample has limited the generalizability of the study’s findings. That is, the participants represent a narrow demographic scope which may not reflect the broader opinions of students in higher education. As such, a more diverse sample may have yielded a deeper understanding of subgroup-specific outcomes and increased the statistical power of the study. It is integral that the developers of future microcredentials understand the limitations of this study in order to provide participants with programs that provide knowledge and experiential benefits.

## Future Recommendations

The usefulness of microcredentials related to skill development cannot be disputed (Sargent et al., 2023). Moreover, the use of microcredentials has continued to demonstrate an innovative opportunity to formalize skill development (Bedford et al., 2019). This proof-of-concept study has demonstrated good utility for the current MSc GH microcredentials; however, the data suggests that future iterations should provide greater attention to the structure of the course to promote higher engagement. As such, it is recommended that the MSc GH program works to establish a systematic approach to microcredential development and iteration. For example, exploring the use of Hybrid-Flexible (HyFlex) course design may support broader audiences by offering flexibility in how learners engage with the course content (Beatty, 2019). Specifically, HyFlex course design proposes the integration of synchronous, asynchronous, and in-person learning options to address the diverse needs and preferences of students (Beatty, 2019). Through incorporating a HyFlex course design, the MSc GH program may be able to provide a more inclusive and adaptable learning environment so that future microcredential iterations may be better suited to learners’ needs and provide a template for curriculum developers to keep up with the constantly evolving GH field. Additionally, it may be pertinent to suggest a formal accreditation of the MSc GH microcredentials from McMaster University. This formal accreditation may work to strengthen the value of the microcredentials, thus increasing student interest and providing learners with credentials that are widely recognized by employers and educational systems at the global scale (Zdunek et al., 2024). In this way, future iterations of the MSc GH microcredentials will ascribe to an evidence-based model and become unified across higher education, promoting transferable skill acquisition and development. As such, researchers, curriculum developers, and university faculty can be more confident that they are targeting pertinent transferable skills, thus positively influencing the transition from school to the labour market.

# Conclusion

The development and implementation of microcredentials offer a transformative asset within the GH field and a reliable way for employers to understand candidate competencies. Within an era marked by increased interconnectedness and a growing need for cross-cultural competency (Thorne et al., 2023), the findings of this thesis conclude that microcredentials can act as a promising tool for higher educational institutions to provide students with opportunities to develop a holistic set of competencies beyond academic knowledge. That is, the training not only equips participants with formalized transferable skills but also works to cultivate an understanding of diverse cultural contexts, communication styles, and collaborative frameworks. Moreover, participating in the microcredential will ensure that graduate students are well prepared to engage in collaborative partnerships, contribute meaningfully to international projects, and address health disparities within the globalized workforce. As such, the integration of microcredentials will evolve the field of GH through producing professionals who are equipped with the interpersonal and collaborative skills necessary to foster positive change within a GH landscape.

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# Appendices

## Appendix A

## Advertising Materials





## Appendix B

## Study Recruitment Email for Program Coordinator

*The Information Letter will be attached to this email.*

Subject: Request for Assistance: Microcredentials Research Project

Hello,

We hope this email finds you well. We are writing to seek your assistance in distributing an important recruitment email to the Global Health program students regarding a research project we are conducting.

We are currently undertaking a student-led research project aimed at evaluating the development and implementation of microcredentials within the Global Health program. This initiative is designed to equip our graduate students with the essential skills required for the evolving global job market and enhance their employability.

The information letter provides detailed information about the project’s objectives, the purpose of the study, and how students can register to participate. We believe that widespread dissemination of this email to all Global Health graduate students will help us reach our target audience and encourage participation in the research study.

Would it be possible for you to assist us by sending out the attached recruitment email to the Global Health program students on our behalf?

Your support in this matter is greatly appreciated. Please let us know if you require any further information or assistance.

Thank you for your help.

Kind regards,

Menna Kohmeiha and Abby Tristani

## Appendix C

## Information Letter

A logo of a university

Description automatically generated

You are being invited to participate in a research study because you are a master’s student in the Global Health program at McMaster University where our study is taking place.

This study is conducted by:

|  |  |
| --- | --- |
| **Local Principal Investigator:**  Dr. Deborah DiLiberto  Global Health  McMaster University  Hamilton, ON, Canada  E-mail: diliberd@mcmaster.ca | **Student Investigators:**  Menna Komeiha  Abby Tristani  Global Health Graduate program  McMaster University  Hamilton, ON, Canada  E-mails: komeiham@mcmaster.ca tristana@mcmaster.ca |

In order to decide whether or not you want to be a part of this research study, you should understand what is involved and the potential risks and benefits. This form provides detailed information about the research study. Once you understand the study, you will be asked to sign this form if you wish to participate. Please take you time to make your decision.

WHY IS THE RESEARCH BEING DONE?

This research aims to address the evolving Canadian job market, which increasingly demands individuals to acquire new skills and develop existing competencies to remain relevant while competing for job opportunities. Currently, employment trends demonstrate that employers are searching for candidates with transferable skills that can be utilized across domains including incisive decision-making and international collaboration. Microcredentials have emerged as a novel method to showcase individuals’ transferable skills in a way that employers are able to understand during the application process. As the labour market continues to move toward skill-based hiring strategies, we want to know if microcredentials are effective means of knowledge translation and beneficial for individuals entering the workforce.

WHAT IS THE PURPOSE OF THIS STUDY?

The purpose of this study is to gauge the implementation and effectiveness of incisive decision-making and international collaboration microcredential courses within McMaster University's MSc Global Health program. You are being asked to participate in this research study because you are a current student in the MSc Global Health program at McMaster University.

WHAT WILL MY RESPONSIBILITIES BE IF I TAKE PART IN THIS STUDY?

If you choose to participate in this study, we will ask you to do the following things:

* Answer questions and engage in discussion about your knowledge, attitudes, and behaviours concerning the incisive decision-making and international collaboration microcredentials offered within the Global Health program at McMaster University.

We are inviting all the students who have enrolled in one or both microcredential courses to participate in this research study. Participants will be asked to complete an enrollment survey that will take approximately 30 minutes to complete. You will only complete it once. Following the enrollment survey, participants will have the ability to participate in a series of virtual focus group discussions or individual interviews.

WHAT ARE THE POSSIBLE RISKS AND DISCOMFORTS?

Participation in any research study may involve a loss of privacy. Information you provide will be recorded, but your name or personal details will not be used in any reports of the information provided. The information that is collected from this study will be locked at our project office. We will do our best to make sure that any personal information is kept private.

HOW MANY PEOPLE WILL BE IN THIS STUDY?

Up to 130 students within the Global Health program will be invited to participate in this study.

WHAT ARE THE POSSIBLE BENEFITS FOR ME AND/OR FOR SOCIETY?

We want to know if microcredentials are an effective means of knowledge translation and how to effectively integrate them into traditional graduate programs. There will be no direct benefit to you from participating in this study, However, the information we gather from this study will provide valuable insight on how to structure future models and areas for improvement.

IF I DO NOT WANT TO TAKE PART IN THE STUDY, ARE THERE OTHER CHOICES?

It is important for you to know that you can choose not to take part in the study. Your participation is not required as part of the microcredential completion and choosing not to participate will in no way affect your completion of your master’s degree.

WHAT INFORMATION WILL BE KEPT PRIVATE?

Your identifiable data will not be shared with anyone. All material with identifiable information will be stored in a separate server and placed in a password protected folder that is encrypted by VeraCrypt software.

CAN I PARTICIPATE IN THIS STUDY AND ANOTHER STUDY?

Yes, you are free to participate in any other research activity. Your participation in another study will not affect your ability to participate in this study. You do not need to disclose if you are participating in another study.

WILL I BE PAID TO PARTIPATE IN THIS STUDY?

If you agree to take part, you will receive a $10 in gift card compensation for each research activity you choose to participate in (e.g., $10 for participating in the survey, $10 for participating in the focus group discussions).

WILL THERE BE ANY COSTS?

There are no costs to you for taking part in this study.

IF I HAVE ANY QUESTIONS OR PROBLEMS, WHOM CAN I CALL?

If you have any questions about the research now or later, please contact us directly at komeiham@mcmaster.ca or tristana@mcmaster.ca. We look forward to your involvement in this important research endeavor.

## Appendix D

## Enrollment Survey Guide

**Study Title**: Soft Skills: From a Subjective Concept to a Measurable Objective

**PART 1: WORDING FOR THE ONLINE SURVEY**

The following text will appear throughout the online survey:

**The “Preamble” Statement:**

*This text will appear at the beginning of the online survey and before the actual questions:*

This survey is administered by Menna Komeiha and Abby Tristani, master thesis students with the Global Health Office, Faculty of Health Sciences at McMaster University. The purpose of this study is to critically address aspects of interdisciplinary teaching and learning within the Graduate Global Health programs at McMaster University. We are interested in exploring the potential of microcredentials as a digital innovation to enhance student engagement, retention, and success. What we learn from this survey will help us understand if microcredentials offer a framework for students to reflect upon their interdisciplinary learning experiences and develop a consolidated and marketable portfolio of in-demand employable skills, thus supporting success following graduation.

This survey should take approximately 30 minutes to complete. Participants filling out this survey must be enrolled in a 2024 MSc Graduate Global Health program at McMaster University.

This study has been reviewed by the Hamilton Integrated Research Ethics Board (HIREB). The HIREB is responsible for ensuring that participants are informed of the risks associated with the research, and that participants are free to decide if participation is right for them. If you have any questions about your rights as a research participant, please call the Office of the Chair, Hamilton Integrated Research Ethics Board at 905-521-2100 ext.42013.

*If the participant clicks the “next” button, the next screen will take the participant to the “Consent to Participate” statement.*

*If the participant clicks the “exit” button, the screen will display the “Quit” statement below.*

**CONSENT TO PARTICIPATE**

By enrolling in this study, you will be asked to complete an enrolment survey before accessing the microcredentials module of your choice. This survey is estimated to take 30 minutes to complete.

**Potential Harms, Risks or Discomforts**

The researchers on the study team will work hard to keep your information private and your identifiable data will not be shared with anyone except with your consent or as required by law. As part of this survey, we will be collecting demographic information to better understand the characteristics of our participants, this may include details such as age, gender, and email address. It is important to note that any of the demographic information provided will be used solely for research purposes and will be aggregated and anonymized to ensure your privacy. All personal information such as your name and email address will be removed from the data and will be replaced with a number. A list linking the number with your name will be kept on a password-protected computer in the Global Health Office at McMaster University, separate from original files.

If the results of the study are published, your name will not be used and no information that discloses your identity will be released or published without your specific consent to the disclosure.

As a participant, you have the right to refrain from answering any questions you are uncomfortable with, and you can take breaks as needed. You are free to withdraw from the study by simply logging off instead of submitting your survey answers. It is important to note that once survey answers are submitted, they cannot be retracted.

**Potential Benefits**

The results of this project may not directly benefit you. However, they will provide valuable insight to the Graduate GH programs on how to structure future modules and areas that require improvement. Your participation contributes to the enhancement of the program for future students, ensuring it remains relevant and effective in preparing students for successful careers in global health.

**Compensation**

After completing this survey, you will become eligible to receive a $10 virtual gift card that will be sent via email.

**Confidentiality**

For the purposes of ensuring proper monitoring of the research study, it is possible that representatives of the Hamilton Integrated REB (HiREB), this institution, and affiliated sites may consult your original research data to check that the information collected for the study is correct and follows proper laws and guidelines. By participating in this study, you authorize such access. Every effort will be made to maintain the confidentiality and privacy of participants. All collected information will be de-identified and stored securely in the study's electronic file management system on a computer protected by passwords and firewalls. Participants will be assigned a study ID number to ensure anonymity. These ID numbers will be randomly allocated, and a master linking list of study ID numbers will be stored separately on a private electronic server within a password-protected folder. Only the researchers will have access to the master linking list. Upon completion of the study, identifiable data will be permanently erased using overwriting software. Please note that direct quotes might be used in the results’ manuscript. By participating in this study, you do not waive any rights to which you may be entitled under the law.

**Participation and Withdrawal**

Your participation in this project is entirely voluntary and not linked to your eligibility to enroll in any microcredential module. Should you choose to participate, rest assured that you can withdraw at any time, including during the study, without facing any penalties or consequences. Additionally, you are free to participate in any other research study. Your participation in another study will not affect your ability to participate in this study. You do not need to tell us if you are participating in another study.

Please note that once survey results are submitted, we will be unable to accommodate requests for data removal. Importantly, your decision to withdraw will not impact your ability to complete modules or enroll in future ones.

**Questions about the Study**

If you have questions or need more information about the study itself, please contact us at: komeiham@mcmaster.ca or tristana@mcmaster.ca

Having read the above, I understand that by clicking the “Yes” button below, I agree to take part in this study under the terms and conditions outlined in the accompanied Participant Information Sheet.

If you do not agree to quotes or other results arising from your participation in the study being included, even anonymously, in any reports about the study, please contact the research assistant, Menna Komeiha (komeiham@mcmaster.ca) or Abby Tristani (tristana@mcmaster.ca).

*If the participant clicks the “yes” button, the next screen will take the participant to the survey questions.*

*If the participant clicks the “no” button, the next screen will display the statement below – the “Do Not Agree to Participate” statement.*

**The “Do Not Agree to Participate” Statement:**

*This text will appear if the participant does not agree to participate:*

Thank you. You have decided not to participate in this survey. No data has been collected from you.

**The “Quit” Statement:**

*There will be a quit button displayed throughout the survey. If the participant decides to hit the “quit button” at any time during the survey, the following statement will appear.*

Thank you. You have decided to quit this survey. None of your survey responses have been collected or stored.

**The “Thank You for Completing the Survey” statement:**

*This wording will appear after the respondent has completed the survey.*

Thank you for taking this survey. Your answers are a valuable part of this research.

**The “Providing participants with the Study’s final results” statement:**

*After the answers have been submitted, a screen will appear that says the following:*

YES "I would like to receive a summary of the study’s results".

Please use this link to sign up to receive a notification when the study’s results have been published. Please note that this information will be stored separately and will not be linked to any information that you submit as a participant in this study.

NO "I do not want to receive a summary of the study’s results."

**PART 2: SURVEY QUESTIONS**

**Section 1: Background**

1. Age:
   1. 18-24
   2. 25-34
   3. 35-44
   4. 45-54
   5. 55-64
   6. 65 or older
2. Gender:
   1. Male
   2. Female
   3. Transgender
   4. Two-Spirit
   5. Non-binary
   6. Prefer not to say
   7. I identify as \_\_\_\_\_\_
3. Do you identify as a member of a minority or racialized group?
   1. Yes
   2. No
   3. Prefer not to disclose
4. Do you identify as an Indigenous person?
   1. Yes
   2. No
5. What is the highest level of education you have completed?
   1. Bachelor’s Degree
   2. Master’s Degree
   3. Doctoral Degree
   4. Professional Degree (e.g., MD, JD)
   5. Other (please specify)

**Section 2: Experience**

1. Within the past two years, have you participated in any microcredential courses at a university?
   1. Yes/No
   2. If yes, please provide the names of the microcredential courses and the universities where you completed them.
2. Are you currently participating in any microcredential programs at McMaster University other than the Global Health microcredentials?
   1. Yes/No
   2. If yes, please briefly describe your involvement and experience
3. How would you rate your current level of awareness and understanding of microcredentials?
   1. Very Poor
   2. Poor
   3. Fair
   4. Good
   5. Very Good
4. What motivated you to enroll in microcredential courses?
   1. Career advancement
   2. Skill development
   3. Personal interest
   4. Stay updated in the field
   5. Other (please specify)

**Section 3: Skills, Confidence, Knowledge**

1. I have the knowledge needed to effectively collaborate with relevant international stakeholders
   1. Strongly disagree
   2. Disagree
   3. Neutral
   4. Agree
   5. Strongly Agree
2. I have the knowledge needed to address ethical issues and ensure community involvement in research processes
   1. Strongly disagree
   2. Disagree
   3. Neutral
   4. Agree
   5. Strongly Agree
3. I have the knowledge needed to mediate and resolve conflicts in an international health context
   1. Strongly disagree
   2. Disagree
   3. Neutral
   4. Agree
   5. Strongly Agree
4. I have the skills needed to foster transparent and trustworthy relationships in global health collaborations
   1. Strongly disagree
   2. Disagree
   3. Neutral
   4. Agree
   5. Strongly Agree
5. I have the knowledge needed to work with other professionals to effectively collaborate with relevant international stakeholders
   1. Strongly disagree
   2. Disagree
   3. Neutral
   4. Agree
   5. Strongly Agree
6. I have the knowledge needed to navigate diplomatic challenges in international health partnerships
   1. Strongly disagree
   2. Disagree
   3. Neutral
   4. Agree
   5. Strongly Agree
7. I have the knowledge needed to identify effective strategies for building and maintaining community partnerships in global health projects
   1. Strongly disagree
   2. Disagree
   3. Neutral
   4. Agree
   5. Strongly Agree
8. I have the knowledge needed to identify factors that build and maintain trust between international partners
   1. Strongly disagree
   2. Disagree
   3. Neutral
   4. Agree
   5. Strongly Agree
9. I have the knowledge needed to identify and describe incisive decision-making strategies for global health issues
   1. Strongly disagree
   2. Disagree
   3. Neutral
   4. Agree
   5. Strongly Agree
10. I am able to describe basic strategies involved in incisive decision-making for global health issues, such as asset-based community building and agenda setting and implementation
    1. Strongly disagree
    2. Disagree
    3. Neutral
    4. Agree
    5. Strongly Agree
11. I have the knowledge needed to discuss the ethical aspects of decision-making in global health
    1. Strongly disagree
    2. Disagree
    3. Neutral
    4. Agree
    5. Strongly Agree
12. I have the knowledge needed to assess resources and external factors to propose viable alternatives in global health scenarios
    1. Strongly disagree
    2. Disagree
    3. Neutral
    4. Agree
    5. Strongly Agree
13. I have the knowledge needed to evaluate the potential outcomes and consequences of different decision-making options
    1. Strongly disagree
    2. Disagree
    3. Neutral
    4. Agree
    5. Strongly Agree
14. I have the knowledge needed to recognize and mitigate biases that may affect my decision-making process
    1. Strongly disagree
    2. Disagree
    3. Neutral
    4. Agree
    5. Strongly Agree
15. I have the knowledge needed to consider cultural, ethical, and social implications when making decisions about global health initiatives
    1. Strongly disagree
    2. Disagree
    3. Neutral
    4. Agree
    5. Strongly Agree
16. I have the knowledge needed to integrate data from diverse sources to inform evidence-based decisions in global health contexts
    1. Strongly disagree
    2. Disagree
    3. Neutral
    4. Agree
    5. Strongly Agree

**Section 4: Willingness to Participate in the Research**

1. Are you willing to participate in interviews or focus group discussions as part of the research study?
   1. Yes
   2. No

## Appendix E

## Feedback Survey Guide

**Study Title**: Soft Skills: From a Subjective Concept to a Measurable Objective

**PART 1: WORDING FOR THE ONLINE SURVEY**

The following text will appear throughout the online survey:

**The “Preamble” Statement:**

*This text will appear at the beginning of the online survey and before the actual questions:*

This survey is administered by Menna Komeiha and Abby Tristani, master thesis students with the Global Health Office, Faculty of Health Sciences at McMaster University. The purpose of this study is to critically address aspects of interdisciplinary teaching and learning within the Master of Science in Global Health (MSc GH) program at McMaster University. We are interested in exploring the potential of microcredentials as a digital innovation to enhance student engagement, retention, and success. What we learn from this survey will help us understand if microcredentials offer a framework for students to reflect upon their interdisciplinary learning experiences and develop a consolidated and marketable portfolio of in-demand employable skills, thus supporting success following graduation.

This survey should take approximately 30 minutes to complete. Participants filling out this survey must be enrolled in the 2024 MSc Global Health program at McMaster University.

This study has been reviewed by the Hamilton Integrated Research Ethics Board (HIREB). The HIREB is responsible for ensuring that participants are informed of the risks associated with the research, and that participants are free to decide if participation is right for them. If you have any questions about your rights as a research participant, please call the Office of the Chair, Hamilton Integrated Research Ethics Board at 905-521-2100 ext.42013.

*If the participant clicks the “next” button, the next screen will take the participant to the “Consent to Participate” statement.*

*If the participant clicks the “exit” button, the screen will display the “Quit” statement below.*

**CONSENT TO PARTICIPATE**

By enrolling in this study, you will be asked to complete an enrolment survey before accessing the microcredentials module of your choice. This survey is estimated to take 30 minutes to complete.

**Potential Harms, Risks or Discomforts**

The researchers on the study team will work hard to keep your information private and your identifiable data will not be shared with anyone except with your consent or as required by law. As part of this survey, we will be collecting demographic information to better understand the characteristics of our participants, this may include details such as age, gender, and email address. It is important to note that any of the demographic information provided will be used solely for research purposes and will be aggregated and anonymized to ensure your privacy. All personal information such as your name and email address will be removed from the data and will be replaced with a number. A list linking the number with your name will be kept on a password-protected computer in the Global Health Office at McMaster University, separate from original files.

If the results of the study are published, your name will not be used and no information that discloses your identity will be released or published without your specific consent to the disclosure.

As a participant, you have the right to refrain from answering any questions you are uncomfortable with, and you can take breaks as needed. You are free to withdraw from the study by simply logging off instead of submitting your survey answers. It is important to note that once survey answers are submitted, they cannot be retracted.

**Potential Benefits**

The results of this project may not directly benefit you. However, they will provide valuable insight to the MSc GH program on how to structure future modules and areas that require improvement. Your participation contributes to the enhancement of the program for future students, ensuring it remains relevant and effective in preparing students for successful careers in global health.

**Compensation**

After completing this survey, you will become eligible to receive a $10 virtual gift card that will be sent via email.

**Confidentiality**

For the purposes of ensuring proper monitoring of the research study, it is possible that representatives of the Hamilton Integrated REB (HiREB), this institution, and affiliated sites may consult your original research data to check that the information collected for the study is correct and follows proper laws and guidelines. By participating in this study, you authorize such access. Every effort will be made to maintain the confidentiality and privacy of participants. All collected information will be de-identified and stored securely in the study's electronic file management system on a computer protected by passwords and firewalls. Participants will be assigned a study ID number to ensure anonymity. These ID numbers will be randomly allocated, and a master linking list of study ID numbers will be stored separately on a private electronic server within a password-protected folder. Only the researchers will have access to the master linking list. Upon completion of the study, identifiable data will be permanently erased using overwriting software. Please note that direct quotes might be used in the results’ manuscript. By participating in this study, you do not waive any rights to which you may be entitled under the law.

**Participation and Withdrawal**

Your participation in this project is entirely voluntary and not linked to your eligibility to enroll in any microcredential module. Should you choose to participate, rest assured that you can withdraw at any time, even after signing the consent form or during the course of the study, without facing any penalties or consequences. Additionally, you are free to participate in any other research study. Your participation in another study will not affect your ability to participate in this study. You do not need to tell us if you are participating in another study.

Please note that once survey results are submitted, we will be unable to accommodate requests for data removal. Importantly, your decision to withdraw will not impact your ability to complete modules or enroll in future ones.

**Questions about the Study**

If you have questions or need more information about the study itself, please contact us at: komeiham@mcmaster.ca or tristana@mcmaster.ca

Having read the above, I understand that by clicking the “Yes” button below, I agree to take part in this study under the terms and conditions outlined in the accompanied Participant Information Sheet.

If you do not agree to quotes or other results arising from your participation in the study being included, even anonymously, in any reports about the study, please contact the research assistant, Menna Komeiha (komeiham@mcmaster.ca) or Abby Tristani (tristana@mcmaster.ca).

*If the participant clicks the “yes” button, the next screen will take the participant to the survey questions.*

*If the participant clicks the “no” button, the next screen will display the statement below – the “Do Not Agree to Participate” statement.*

**The “Do Not Agree to Participate” Statement:**

*This text will appear if the participant does not agree to participate:*

Thank you. You have decided not to participate in this survey. No data has been collected from you.

**The “Quit” Statement:**

*There will be a quit button displayed throughout the survey. If the participant decides to hit the “quit button” at any time during the survey, the following statement will appear.*

Thank you. You have decided to quit this survey. None of your survey responses have been collected or stored.

**The “Thank You for Completing the Survey” statement:**

*This wording will appear after the respondent has completed the survey.*

Thank you for taking this survey. Your answers are a valuable part of this research.

**The “Providing participants with the Study’s final results” statement:**

*After the answers have been submitted, a screen will appear that says the following:*

YES "I would like to receive a summary of the study’s results".

Please send the brief summary of the study results to this email address: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

NO "I do not want to receive a summary of the study’s results."

**PART 2: SURVEY QUESTIONS**

**Section 1: Background**

1. Age
   1. 18-24
   2. 25-34
   3. 35-44
   4. 45-54
   5. 55-64
   6. 65 or older
2. Gender:
   1. Male
   2. Female
   3. Transgender
   4. Two-Spirit
   5. Non-binary
   6. Prefer not to say
   7. I identify as \_\_\_\_\_\_
3. Do you identify as a member of a minority or racialized group?
   1. Yes
   2. No
   3. Prefer not to disclose
4. Do you identify as an Indigenous person?
   1. Yes
   2. No
5. What is your highest level of education obtained?
   1. Bachelor’s Degree
   2. Master’s Degree
   3. Doctoral Degree
   4. Professional Degree (e.g., MD, JD)
   5. Other (please specify)

**Section 2: Experience**

1. Have you previously participated in any microcredential courses at a university?
   1. Yes/No
   2. If yes, please provide the names of the microcredential courses and the universities where you completed them.
2. Are you currently aware of or involved in any microcredential programs at McMaster University?
   1. Yes/No
   2. If yes, please briefly describe your involvement and experience
3. How would you rate your current level of awareness and understanding of microcredentials?
   1. Very Poor
   2. Poor
   3. Fair
   4. Good
   5. Very Good
4. What motivated you to enroll in microcredential courses?
   1. Improve employability/career advancement
   2. Specific global health kill development
   3. Personal interest
   4. Stay updated in the field
   5. Other (please specify)
5. If you chose NOT to participate in the Global Health microcredential courses, what was the primary reason? (Please select all that apply):
   1. Lack of time
   2. Uncertainty of the value of microcredentials
   3. Lack of awareness of the program offerings
   4. The microcredential courses were irrelevant to my academic/career goals
   5. Other (please specify):\_\_\_\_\_\_\_

**Section 3: Skills, Confidence, Knowledge**

1. I have the knowledge needed to effectively collaborate with relevant international stakeholders
   1. Strongly disagree
   2. Disagree
   3. Neutral
   4. Agree
   5. Strongly Agree
2. I have the knowledge needed to address ethical issues and ensure community involvement in research processes
   1. Strongly disagree
   2. Disagree
   3. Neutral
   4. Agree
   5. Strongly Agree
3. I have the knowledge needed to mediate and resolve conflicts in an international health context
   1. Strongly disagree
   2. Disagree
   3. Neutral
   4. Agree
   5. Strongly Agree
4. I have the skills needed to foster transparent and trustworthy relationships in global health collaborations
   1. Strongly disagree
   2. Disagree
   3. Neutral
   4. Agree
   5. Strongly Agree
5. I have the knowledge needed to work with other professionals to effectively collaborate with relevant international stakeholders
   1. Strongly disagree
   2. Disagree
   3. Neutral
   4. Agree
   5. Strongly Agree
6. I have the knowledge needed to navigate diplomatic challenges in international health partnerships
   1. Strongly disagree
   2. Disagree
   3. Neutral
   4. Agree
   5. Strongly Agree
7. I have the knowledge needed to identify effective strategies for building and maintaining community partnerships in global health projects
   1. Strongly disagree
   2. Disagree
   3. Neutral
   4. Agree
   5. Strongly Agree
8. I have the knowledge needed to identify factors that build and maintain trust between international partners
   1. Strongly disagree
   2. Disagree
   3. Neutral
   4. Agree
   5. Strongly Agree
9. I have the knowledge needed to identify and describe incisive decision-making strategies for global health issues
   1. Strongly disagree
   2. Disagree
   3. Neutral
   4. Agree
   5. Strongly Agree
10. I am able to describe basic strategies involved in incisive decision-making for global health issues, such as asset-based community building and agenda setting and implementation
    1. Strongly disagree
    2. Disagree
    3. Neutral
    4. Agree
    5. Strongly Agree
11. I have the knowledge needed to discuss the ethical aspects of decision-making in global health
    1. Strongly disagree
    2. Disagree
    3. Neutral
    4. Agree
    5. Strongly Agree
12. I have the knowledge needed to assess resources and external factors to propose viable alternatives in global health scenarios
    1. Strongly disagree
    2. Disagree
    3. Neutral
    4. Agree
    5. Strongly Agree
13. I have the knowledge needed to evaluate the potential outcomes and consequences of different decision-making options
    1. Strongly disagree
    2. Disagree
    3. Neutral
    4. Agree
    5. Strongly Agree
14. I have the knowledge needed to recognize and mitigate biases that may affect my decision-making process
    1. Strongly disagree
    2. Disagree
    3. Neutral
    4. Agree
    5. Strongly Agree
15. I have the knowledge needed to consider cultural, ethical, and social implications when making decisions about global health initiatives
    1. Strongly disagree
    2. Disagree
    3. Neutral
    4. Agree
    5. Strongly Agree
16. I have the knowledge needed to integrate data from diverse sources to inform evidence-based decisions in global health contexts
    1. Strongly disagree
    2. Disagree
    3. Neutral
    4. Agree
    5. Strongly Agree

**Section 4: Microcredential Experience**

1. The microcredentials modules prepared me to demonstrate my global health related transferable skills to a potential employer
   1. Strongly disagree
   2. Disagree
   3. Neutral
   4. Agree
   5. Strongly Agree
2. The microcredential modules allowed me to consolidate what I have learned during the Global Health program at McMaster University
   1. Strongly disagree
   2. Disagree
   3. Neutral
   4. Agree
   5. Strongly Agree
3. The microcredential modules supported my acquisition of the transferable skill that they were designed for
   1. Strongly disagree
   2. Disagree
   3. Neutral
   4. Agree
   5. Strongly Agree
4. The microcredentials made me feel confident that I can effectively collaborate with relevant international stakeholders
   1. Strongly disagree
   2. Disagree
   3. Neutral
   4. Agree
   5. Strongly Agree
5. The microcredentials made me feel confident to work with other members of other professions to effectively collaborate with relevant stakeholders
   1. Strongly disagree
   2. Disagree
   3. Neutral
   4. Agree
   5. Strongly Agree
6. The microcredentials enhanced my ability to effectively collaborate with relevant international stakeholders
   1. Strongly disagree
   2. Disagree
   3. Neutral
   4. Agree
   5. Strongly Agree
7. The international collaboration microcredential course was effective for learning the principles and practices of effectively collaborating with relevant international stakeholders from a global health perspective
   1. Strongly disagree
   2. Disagree
   3. Neutral
   4. Agree
   5. Strongly Agree
8. After taking the international collaboration microcredential course, I have a better understanding about how to effectively collaborate with relevant international stakeholders from a global health perspective than I had before taking this course
   1. Strongly disagree
   2. Disagree
   3. Neutral
   4. Agree
   5. Strongly Agree
9. After completing the international collaboration microcredential course, I am better equipped to apply the principles and practices of effectively collaborating with relevant international stakeholders to real world experiences than I was before taking this course
   1. Strongly disagree
   2. Disagree
   3. Neutral
   4. Agree
   5. Strongly Agree
10. The incisive decision-making microcredential was effective for learning the principles and practices necessary in identifying and resolving common ethical issues and challenges when working with vulnerable populations
    1. Strongly disagree
    2. Disagree
    3. Neutral
    4. Agree
    5. Strongly Agree
11. After participating in the incisive decision-making microcredential course, I have a better understanding of how to effectively apply leadership practices and foster collaborative skills
    1. Strongly disagree
    2. Disagree
    3. Neutral
    4. Agree
    5. Strongly Agree
12. Following the incisive decision-making microcredential course, I am better equipped to adapt my specific expertise to address healthcare needs in resource-constrained settings
    1. Strongly disagree
    2. Disagree
    3. Neutral
    4. Agree
    5. Strongly Agree
13. After taking the incisive decision-making microcredential course, I am better equipped to conduct comprehensive situational analyses in a real-world setting
    1. Strongly disagree
    2. Disagree
    3. Neutral
    4. Agree
    5. Strongly Agree

**Section 5: Follow Up Questions**

1. The microcredentials were designed to fit the learners’ busy schedule. To what extent were you able to seamlessly integrate the various components of the modules into your routine without encountering significant conflict?
   1. Not at all able to integrate
   2. Slightly able to integrate
   3. Moderately able to integrate
   4. Mostly able to integrate
   5. Completely able to integrate
2. What factors would encourage you to participate in future iterations of the Global Health microcredential courses? Please select all that apply.
   1. Course alignment
   2. Specific career benefits
   3. More information about the microcredential program
   4. Increased interaction with other individuals participating in the course
   5. Other (please specify):\_\_\_\_\_

**Section 6: Open Ended Questions**

* + - 1. How do envision using the microcredential badges in future job applications?
      2. What other transferable skills would you like future iterations of microcredential modules to address?
      3. Do you have any other comments you would like to add regarding your experience with the microcredential course?

## Appendix F

## HiREB Approval





## Appendix G

## A2L Announcement

Title: Welcome!

Hello and welcome to the exciting new microcredential program, made specifically for you as Global Health students! We are delighted to have you join us for this pilot program that will help you master essential soft skills designed to give you a competitive edge in the global job market.

**In this program, you will undertake two comprehensive microcredentials:**

**(1) International Collaboration**

This microcredential will help you understand how to navigate diverse perspectives, address complex health challenges on a global scale, and select and apply strategies to work towards common goals with various stakeholders

**(2) Incisive Decision-Making**

This microcredential is designed to equip with the necessary skills to make prompt and critical decisions amid competing priorities while adhering to ethical principles

**In order to successfully earn each microcredentials, you will need to:**

1. **Engage with the video lectures**
   * Each module will feature insightful videos on core concepts and best practices. Your engagement with these materials will be crucial for succeeding the subsequent assessments
2. **Answer the Checkpoint Questions**
   * Following the video lectures, you will be required to complete quizzes. **A score of at least 80%** on each quiz is required for passing the microcredential.
3. **Contribute to Discussion Forums**:
   * Some modules will require you to actively participate through discussion. In these instances, you will respond to thoughtful reflection questions or case studies.

These micro-credentials are tailored to enhance your professional abilities and prepare you for the dynamic demands of the global job market. We encourage you to fully participate and embrace opportunity to develop valuable skills.

Best of luck and we look forward to your active participation!

Warm regards,

Menna & Abby