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McMaster University Research Centres & Institutes

2021 Annual Aggregated Report

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An overview of 2021

The success of McMaster's Research Centres and Institutes (RCIs) is dependent upon the people – the directors, faculty, staff and students – who work within them. I'm happy to share some of those successes with you, in this RCI annual report. Through the 2021 reporting process, I was repeatedly reminded of the high-quality work coming out of our multidisciplinary and Faculty-based RCIs. I'd be remiss if I didn't recognize the individual and collective contributions of all those involved; particularly their dedication during the specific challenges associated with the global pandemic. Often, their support was critical in McMaster's efforts in the fight against COVID-19 and they continued to provide leadership in our visioning of a post-pandemic world.

Our excellence in research is driven by the efforts of our research community – efforts that are amplified through our RCIs. These centres and institutes allow our faculty members and their research teams to focus on the most pressing and demanding problems facing society, to pool their talents and resources, and to maximize institutional impact and output. Specifically, RCIs allow us to advance our strategic research objectives; to enhance research collaborations; to facilitate interdisciplinary research; to stimulate partnerships; to expand our research presence on the global stage; to increase our ability to secure funding for major research initiatives; and to strengthen the linkages between research and teaching.

In 2021 McMaster established three new RCIs: i) Centre for Excellence in Protective Equipment and Materials (CEPEM) with Dr. Ravi Selvaganapathy as Director ii) Centre for Discovery in Cancer Research (CDCR) with Dr. Shelia Singh as Director and iii) Schroeder Allergy and Immunology Research Institute, with Dr. Susan Waserman as Director. In addition, Dr. Tracy Bear joined the university as Director of the McMaster Indigenous Research Institute (MIRI). Dr. Bear holds joint appointments in the Faculties of Social Sciences and Health Sciences.

In June, the policy document [Guidelines for the Governance and Review of Research Institutes, Centres and Groups](#) was approved by the Board of Governors. These updated guidelines recognize the importance of RCIs in the university's research enterprise. In accordance with the new policy, 11 external RCI reviews were initiated, and the overwhelming message was an acknowledgement of the excellence of the centres and institutes reviewed, and the work of the directors. The review process and the expertise of the review board members allowed us to gain critical feedback for the future strategic direction of RCI activity.

With funds from the Office of the Vice-President, Research, we established a new initiative – the RCI Undergraduate Summer Research Program. In this first year, 12 undergraduates – spread evenly across the Faculties – received support to work in a centre or institute of their choice, often gaining their first experience in a research environment.

This aggregated report speaks to both the qualitative and quantitative impact of our 63 centres and institutes during 2021, and it's an amazing story. More than 50% of McMaster's peer reviewed journal publications were enabled by one or more of our RCIs. They directly benefitted close to 500 post-doctoral fellows, nearly 2300 graduate students, and some 2100 undergraduate students. And, they advanced the work of almost 1400 external collaborators, for example those working with our industrial partners, not-for-profits, and government organizations.

Dr. Andy Knights
Associate Vice-President, Research
Office of the Vice-President (Research)



RCIs By the Numbers

Interacting with RCIs in 2021:

1543

Faculty¹

494

Postdoctoral
Fellows²

2289

Graduate
Students³

2093

Undergraduate
Students⁴

2207

Other Academic
Researchers⁵

1394

Other
Non-Academic
Researchers⁶

1 Total number of faculty member/RCI interactions

2 Number of PDFs supported by our RCIs

3 Number of graduate students supported by our RCIs

4 Number of undergraduates working with RCIs

5 Number of non-McMaster academic researchers interacting with our RCIs

6 Number of external collaborators such as from industry, not-for-profits, and government, supported by our RCIs

RCIs By the Numbers

Enabled by RCIs in 2021:

3567

Journal
Publications

369

Conference
Proceedings

1444

Conference
Presentations

403

Graduate Degree
Completions

468

Undergraduate
Senior Projects

573

Reports for External
Organizations

50

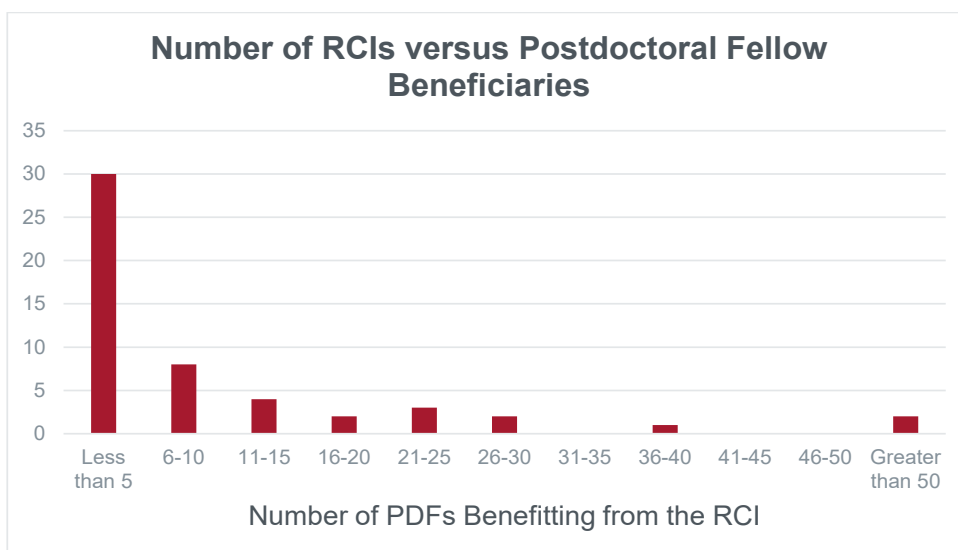
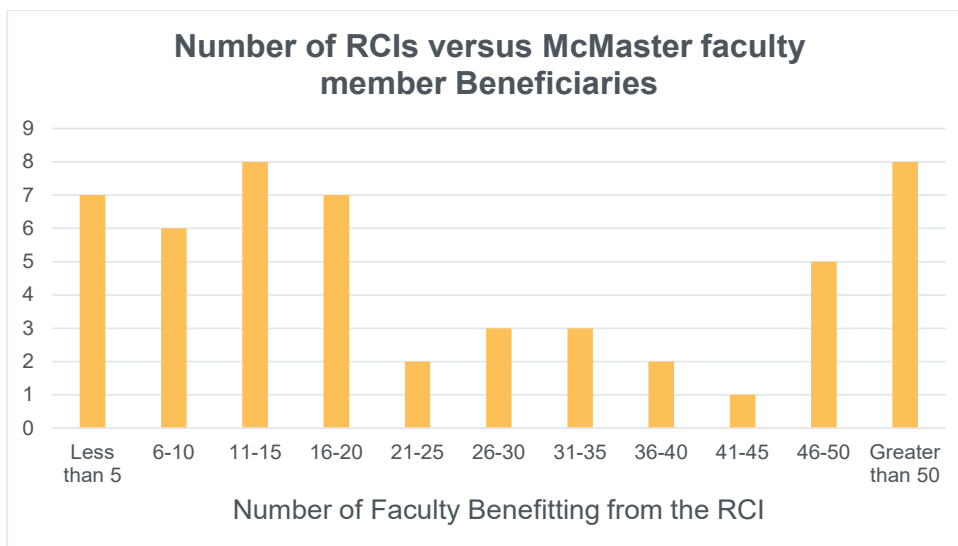
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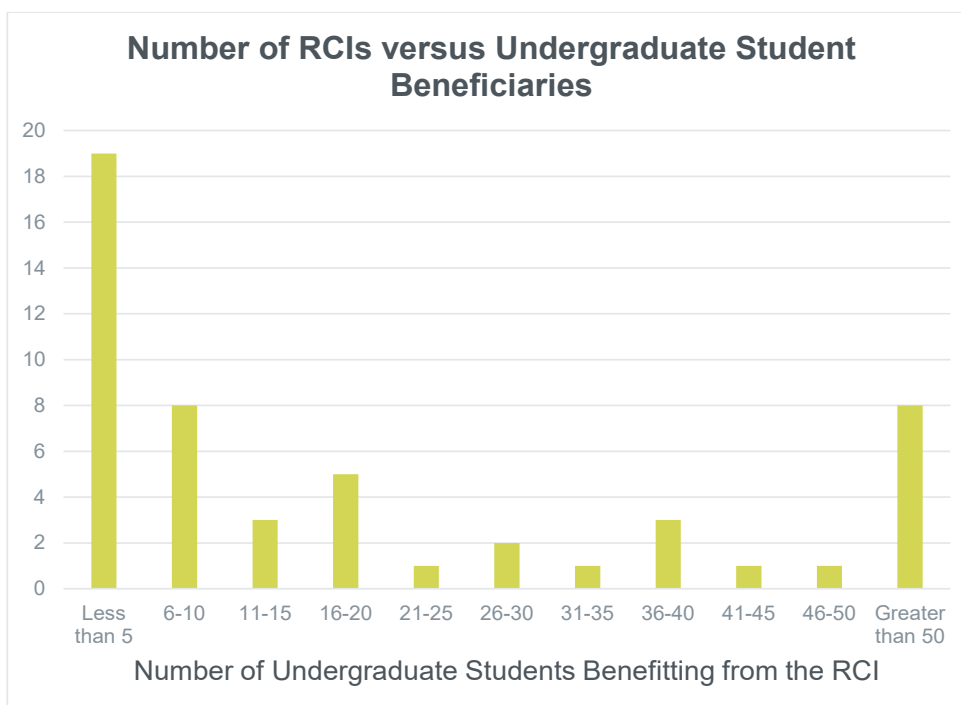
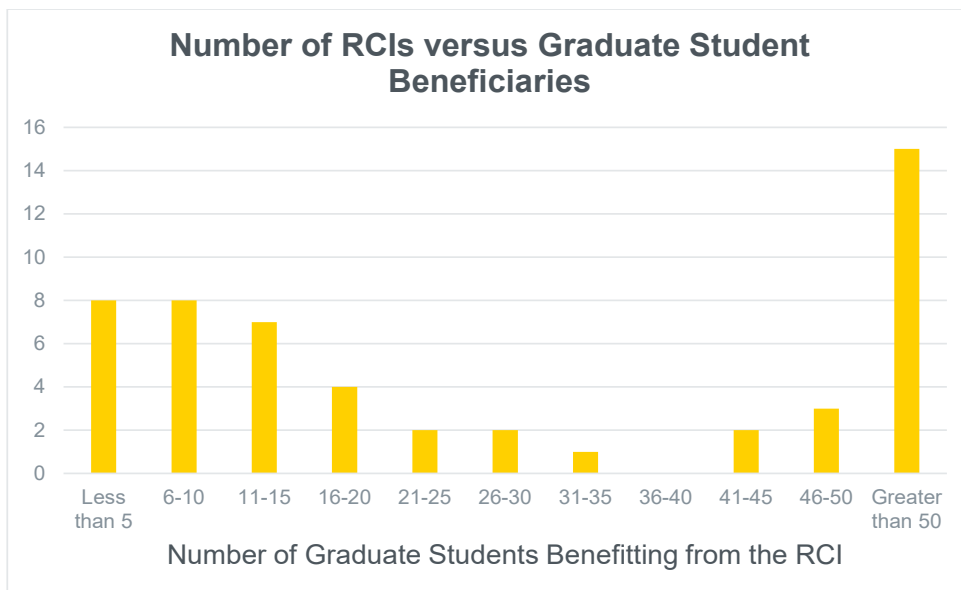
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Patents

636

Licences to External
Organizations





Research Impact and Influence examples

Visualizing coronavirus-cellular infections

Researchers at the [Canadian Centre for Electron Microscopy \(CCEM\)](#) – which houses a suite of some of the world's most advanced imaging tools, capable of measuring materials and chemistry at ultra-high resolution – are using advanced technologies to track the real-time evolution of the HCoV 229E coronavirus for early surveillance of the virus' transmissibility and infectiousness.

While cryo-electron microscopy has helped researchers determine the shape of the spike protein and better provide models for how infection might occur, it's proven difficult to capture an infection event in an actual cell. CCEM researchers have overcome this challenge by using a technique called focused ion beam nanotomography, which allows scientists to slice a block of material – similar to slicing cheese at a deli – for a full 3-D image.

Working with researchers in the Faculty of Health Sciences and the Ontario company Fibics, CCEM scientists imaged the infection of lung cells by the SARS-CoV2 analogue in order to provide context for the spike-cell interaction. Ultimately, they were able to capture the exact moment of viral infection in 3-D, providing direct insight into the biomechanics of the interaction and allowing researchers to determine the effects of different treatments on viral infection.

The study has opened a world of possibilities for biomedical imaging applications in other fields.



Sparking social research innovation

Obtaining ethical approval, collecting and analyzing data in real-time, and sharing actionable findings are difficult without face-to-face meetings with subjects. Which is why the pandemic dealt social research such a blow.

Enter [Spark - a centre for social research innovation](#). Up and running for just a year-and-a-half, the centre for social research sprang into action to deliver a weekly virtual speaker series featuring leading experts from around the world. For 40 weeks, social research methods and tools were shared with more than 250 virtual attendees. Proving so popular, the sessions continue today as Spark Talks, and a toolkit has been developed to guide researchers in socially distanced yet deeply engaged qualitative research.

Add one-on-one training on a specific design or methodology challenge, fee-for-service research support, and a dedicated space for collaborative, interdisciplinary research, and it's easy to see why academics, businesses, governments and community organizations alike are making Spark their go-to source for the tools needed to solve complex social problems.



Next-generation biosensing technologies

A team of McMaster researchers working at the forefront of biosensing technology has developed a next-generation, rapid saliva test for COVID-19 that could soon be available for home use.

The antigen test is easier, faster and more accurate than any current point-of-care diagnostic. It requires only a small saliva sample and delivers results in 10 minutes, using an electrochemical sensor system similar to a glucose sensor. Validated using over 70 clinical samples, the test has shown foolproof accuracy in identifying users who are Covid free.

The new technology represents the combined efforts of more than a dozen scientists across three faculties, led by Drs. John Brennan (chemistry and chemical biology), Yingfu Li (biochemistry and biomedical sciences), and Leyla Soleymani (engineering physics). Their work was funded by more than \$2 million from the Canadian Institutes of Health Research and other sources.

A major part of this work was carried out at the McMaster's **Biointerfaces Institute (BI)** of which Brennan is Director. This state-of-the-art facility is uniquely equipped to help scientists develop portable, easy-to-use tests. The antigen test is one of many developed by McMaster researchers to enable rapid and accurate detection of such deadly infections as S. Aureus, C. difficile and Legionnaires' disease.

Zentek, a Canadian biotechnology company, has licensed and is working to commercialize the new COVID-19 test and is partnering with McMaster to develop diagnostic tests for other pathogens.

Seeing through the smoke

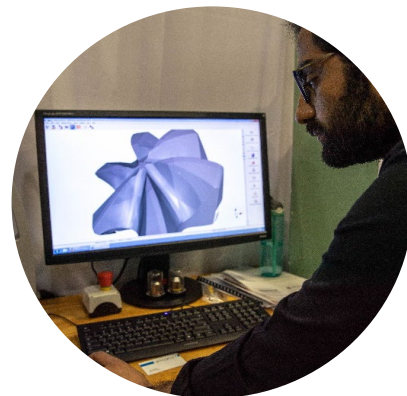
Protecting firefighters on the job can mean the difference between life and death – for them and those they're trying to save – and one of the biggest challenges is seeing through heavy smoke. Thanks to the **McMaster Manufacturing Research Institute (MMRI)**, Canada's most advanced and best equipped manufacturing research laboratory, a solution is just around the corner.

Teams of MMRI researchers are applying advanced surface engineering concepts to help Longan Vision, a start-up company founded by McMaster alumni and students, produce an innovative augmented reality visor with thermal imaging. It features an easy-to-read heads-up display that lets firefighters see through smoke, examine the structure of a building, locate team members and victims, and check for fire sources.

For the "smart visor system" MMRI researchers designed and developed a novel coating that meets operating temperature requirements, is scratch resistant, and has the desired reflective properties to support the optical projection of images.

Following a series of prototypes, MMRI is providing further support to Longan Vision as it works to ramp-up manufacturing. But their work is already being recognized – Longan Vision was recently honored as one of the 101 top "Canada based Product Design companies" by Best Startup Canada.

The partnership with Longan Vision is just one example of how MMRI is fueling manufacturing innovation and the commercialization of new products through aggressive technology transfer across a wide range of industries, from automotive and aerospace, mould and die companies, food preparation, medical devices and nuclear refurbishment and small modular reactors (SMRs).



Stepping up for older adults

Social isolation and mobility limitations are challenges that many older adults face. As COVID-19 began impeding contact between friends and families — important supports to older adults physical and mental health — the **McMaster Institute for Research on Aging (MIRA)** sprang into action with initiatives to help older adults stay active and engaged.

- Housed at MIRA, the Canadian Longitudinal Study on Aging (CLSA) received over \$6 million from funders and partners to study the long-term impact of COVID-19 on health and wellbeing, including aging brains. This is in addition to \$76 million of federal funding CLSA received to support its next phase of research.
- Over 15 related publications following this funding — for example, research led by Dr. Parminder Raina in *Nature Aging* found that 43% of adults 50+ experienced moderate or high levels of depressive symptoms at the beginning of the pandemic that increased over time. This research has been shared in over 35 news outlets internationally.
- \$75,000 in Covid-19 grants to study the impact of social distancing on older Hamiltonians, along with innovative ways to improve it.
- Covid-19 content on MIRA's Optimal Aging Portal to help older adults and those who care for them make informed decisions.
- A study to gauge the mental health impact of the pandemic on working adults in Hamilton and suggest appropriate coping strategies.
- Bringing older community members and McMaster undergraduates together online to reduce social isolation and help students learn about diverse experiences of aging.

MIRA also worked to address the needs of its member researchers and trainees, conducting a survey on supports for those affected by the pandemic, hosting Idea Exchange webinars to explore challenges faced by cross-Faculty research teams, and offering extensions to all active funded research.

These outreach efforts ensured there was no interruption in MIRA's internationally renowned work advancing the science of aging and creating useable, practical, older adult-centred solutions that promote aging in place.



Beating the drums for democracy

At a time when democracies everywhere are under siege, McMaster's **Centre for Human Rights and Restorative Justice (CHRRJ)** is showing just how much can be done to counteract the spread of authoritarianism.

Its global network Participedia has become the largest database of its kind in the world, an open-access crowdsourcing platform, similar to Wikipedia, for researchers, activists, practitioners and others interested in public participation and democratic innovations. Users can conduct research, contribute content, create teaching material, and more.

In its first five years of operation, Participedia documented more than 1,600 cases and 330 methods of democratic innovation around the world. Last year, it expanded its scope to include five new research areas, organized a new Teaching, Training and Mentoring Committee, and introduced a student-run podcast and co-design workshops.

CHRRJ's impact around the world is being felt in other ways. Director Bonny Ibhawoh, who holds the Senator William McMaster Chair in Global Human Rights, amassed a team of graduate students to help the Global Climate Assembly with its first ever presentation to COP26, the United Nations Climate Change Conference. And CHRRJ is assisting Research Assistants with a series of essays to be released with *Public Agenda*, a U.S. organization dedicated to strengthening democracy.

Which goes to show that human rights and restorative justice can take many forms

Sifting the wheat from the chaff on social media

Why do some people believe in fake news on social media while others do not? Researchers in the [McMaster Digital Transformation Research Centre \(MDTRC\)](#) think it may have less to do with ideology and more to do with social media itself and the mechanisms through which users interact with information on these platforms.

With support from a Social Sciences and Humanities Research Council (SSHRC) Insight grant, they are testing their hypothesis, which will enable them to develop information technology (IT) interventions that make it easier for social media users to spot the real from the fake.

Leading the team is DeGroote School of Business Dean Khaled Hassanein, former director of MDTRC, and associate professor Goran Calic, who blends psychology and mathematical modeling with computer science and strategic management. They're collaborating with Mahdi Mirhoseini at Concordia University, a former postdoctoral fellow at MDTRC.

They believe that understanding how individuals process and respond to online information is key. Most research to date has focused on psychological and political drivers, but Hassanein and Calic will examine the role of social media itself.

Specifically, they plan to study the impact of different types of social media on two cognitive mechanisms which cause users to believe in fake news: classical reasoning, whereby users choose impulsivity over deliberation (typical of fun-seeking Facebook users); and motivated reasoning, whereby users believe information that supports what they already think (those who favor Medium, as an example). As capturing cognitive processes is not possible using traditional methods, researchers will use Electroencephalography (EEG) as a measurement tool. They will then design specific IT interventions targeted to each type of user.

Their project is the latest example of MDTRC's cutting-edge multidisciplinary research aimed at better understanding how the digital age revolution is impacting individuals and transforming organizations and society at large.



Bringing Black history to light

A former slave turned town crier, the first Black Methodist congregation, an early troupe of travelling Black musicians, a 1947 all-Black women's basketball team.

If you're wondering which U.S. city lays claim to these, you're on the wrong track. They're all part of the rich history of the Black community in Hamilton, Ontario, and they've only recently come to light thanks to a project funded by McMaster's [Centre for Community Engaged Narrative Arts \(CCENA\)](#).

Recognizing the inherent value of diverse communities' stories as an important way to address the inequities in our world, CCENA worked in concert with the Afro-Canadian Caribbean Association of Hamilton (ACCA) and the Hamilton Black History Council, to create a Hamilton Black History Database.

Together, they hired Aaron Parry, a McMaster arts student from Hamilton's Black community, to survey Black History resources in archives and personal collections around the city. His task had one goal--to bring local Black history to light and make it accessible to current and future generations.

The database, launched in February 2022, includes a searchable catalogue of personal testimonies, music, photos, videos, newspaper articles and website links. It has become an invaluable "one-stop shop" for Hamilton's Black history resources and archives, many of which exist in scattered places around the city or in archives inaccessible to the public.

Parry hopes the database will instill pride among members of Hamilton's Black community and serve as a rich educational tool for young people. The site will be updated regularly, ensuring it remains an important and constant resource for all Hamiltonians and an important tool in sustaining art-based community listening, remembering, and story-making.

List of Research Centres and Institutes

Bertrand Russell Research Centre
Director: Dr. Alex Klein

Biointerfaces Institute
Director: Dr. John Brennan

Brockhouse Institute for Materials Research
Director: Dr. Alex Adronov

Canadian Centre for Electron Microscopy
Director: Dr. Nabil Bassim

Can-Child: Centre for Childhood Disability Research
Director: Dr. Dina Brooks

Centre for Advanced Research in Experimental and Applied Linguistics
Director: Dr. Ivona Kucerova

Centre for Ancient Numismatics
Co-Directors: Dr. Spencer Pope and Dr. Martin Beckmann

Centre for Clinical Neuroscience
Director: Dr. Flavio Kapczynski

Centre for Community-Engaged Narrative Arts
Co-Directors: Dr. Lorraine York and Dr. Daniel Coleman

Centre for Emerging Device Technologies
Director: Dr. Ayse Turak

Centre for Excellence in Protective Equipment and Materials
Director: Dr. Ravi Selvanganapthy

Centre for Health Economics & Policy Analysis
Director: Dr. Jean-Eric Tarride

Centre for Human Rights and Restorative Justice
Director: Dr. Bonny Ibhawoh

Centre for Mechatronics and Hybrid Technologies
Director: Dr. Saied Habibi

Centre for Metabolism, Obesity, and Diabetes Research
Co-Directors: Dr. Katherine Morrison and Dr. Gregory Steinberg

Centre for Networked Media and Performance
Acting Director: Dr. Christine Quail

Centre for Peace Studies
Director: Dr. Chandrima Chakraborty

Centre for Research in Micro- and Nano-Systems
Director: Dr. Jamal Deen

Chanchlani Research Centre
Director: Dr. Sonia Anand

David Braley Centre for Antibiotic Discovery
Director: Dr. Gerry Wright

Escarpment Cancer Research Institute
Director: Dr. Mark Levine

Farncombe Family Digestive Health Research Institute
Director: Dr. Steve Collins

Biomedical Engineering and Advanced Manufacturing
Director: Dr. John Brennan

General Motors Centre for Automotive Materials and Corrosion
Director: Dr. Joey Kish

Gilbrea Centre for Studies in Aging
Acting Director: Dr. Meredith Girffin

Institute for Multi-Hazard Systemic Risk Studies
Director: Dr. Wael El-Dakhakhni

Institute on Ethics and Policy for Innovation
Director: Dr. Claudia Emerson

Institute on Globalization and the Human Condition
Director: Dr. Petra Rethmann

L.R. Wilson Institute for Canadian History
Director: Dr. Ian McKay

Labarge Centre for Mobility in Aging
Director: Dr. Parminder Raina

Lewis and Ruth Sherman Centre for Digital Scholarship
Director: Dr. Andrea Zeffiro

MacData Institute
Director: Dr. Paul McNicholas

McMaster Cancer Research Centre
Director: Dr. Shelia Singh

McMaster Centre for Climate Change
Director: Dr. Altaf Arain

McMaster Centre for Scholarship in Public Interest
Director: Dr. Henry Giroux

McMaster Centre for Software Certification
Director: Dr. Richard Paige

McMaster Centre for Transfusion Research
Director: Dr. Donnie Arnold

McMaster Digital Transformation Centre
Director: Dr. Milena Head

McMaster Immunology Research Centre
Director: Dr. Carl Richards

McMaster Indigenous Research Institute
Director: Dr. Tracey Bear

McMaster Institute for Energy Studies
Director: Dr. Dave Novog

McMaster Institute for Music and the Mind
Director: Dr. Laurel Trainor

McMaster Institute for Research on Aging
Director: Dr. Parminder Raina

McMaster Institute for Transport and Logistics
Director: Dr. Saideh Ravazi

McMaster Institute of Health Equity
Acting Director: Dr. Marisa Young

McMaster Manufacturing Research Institute
Director: Dr. Stephen Veldhuis

McMaster Midwifery Research Centre
Director: Dr. Beth Murray-Davis

McMaster Physical Activity Centre of Excellence
Director: Dr. Stuart Phillips

McMaster Steel Research Centre
Director: Dr. Joe McDermid

McMaster University Centre for Buddhist Studies
Director: Dr. James Benn

McMaster Centre for Effective Design of Structures
Co-Directors: Dr. Wael El-Dakhakhni and Dr. Mike Tait

Michael G. DeGroote Centre for Medicinal Cannabis
Research
Director: Dr. James MacKillop

Michael G. DeGroote Cochrane Canada Centre at
McMaster
Director: Dr. Holger Schunemann

Michael G. DeGroote Institute for Infectious Disease
Research
Director: Dr. Lori Burrows

Michael G. DeGroote Institute for Pain Research and
Care
Director: Dr. Norm Buckley

Michael G. DeGroote National Pain Centre
Director: Dr. Norm Buckley

Offord Centre for Child Studies
Director: Dr. Ellen Lipman

Population Health Research Institute
Director: Dr. Salim Yusuf

Schroeder Allergy and Immunology Research Institute
Director: Dr. Susan Waserman

Spark: A Centre for Social Research Innovation
Director: Dr. Michelle Dion

Statistics Canada Research Data Centre at McMaster
Director: Dr. Michael Veall

The McMaster Origins Institute
Director: Dr. Jonathon Stone

Thrombosis and Atherosclerosis Research Institute
Director: Dr. Jeffery Weitz



April 2022

TO: University Planning Committee and Senate

FROM: Kim Dej
Acting Vice-Provost, Faculty
Co-Chair, Quality Assurance Committee

Doug Welch
Vice-Provost and Dean of Graduate Studies
Co-Chair, Quality Assurance Committee

RE: 2020 - 2021 IQAP Cyclical Program Reviews

INTRODUCTION

The purpose of Institutional Quality Assurance Process (IQAP) program reviews is to assist academic units in clarifying their objectives and to assess curriculum and pedagogical policies, including desirable changes for future academic development. Although the primary objective for these reviews is the improvement of our academic programs, the processes that we adopt are also designed to meet our responsibility to the government on quality assurance. The process by which institutions meet this accountability to the government is outlined in the Quality Assurance Framework (QAF), developed by the Ontario Councils of Academic Vice-Presidents (OCAV). Institutions' compliance with the QAF is monitored by the Ontario Universities Council on Quality Assurance, also known as the Quality Council, which reports to OCAV and the Council of Ontario Universities.

The goal of McMaster's IQAP is to facilitate the development and continued improvement of our undergraduate and graduate academic programs, and to ensure that McMaster continues to lead internationally in its reputation for innovation in teaching and learning and for the quality of its programs. McMaster's IQAP is intended to complement existing mechanisms for critical assessment and enhancement, including departmental reviews and accreditation reviews. The uniqueness of each program emerges through the self-study.

All program review reports (including self studies, review team recommendations, departmental responses, and dean's implementation plans) are submitted to McMaster's Quality Assurance Committee, a joint committee of Undergraduate and Graduate Councils. The Quality Assurance Committee assesses all submitted reports and prepares a Final Assessment Report (FAR) for each program review conducted during the previous academic session. Each FAR:

- Identifies significant strengths of the program;
- Addresses the appropriateness of resources for the success of the program;

- Identifies opportunities for program improvement and enhancement;
- Identifies and prioritizes the recommendations;

Undergraduate Council and/or Graduate Council will review this report to determine if it will make additional recommendations.

2019 -2021 IQAP CYCLICAL PROGRAM REVIEWS

The following programs were reviewed during 2019-20:

Undergraduate Programs

Peace Studies

The following programs were reviewed during 2020-21:

Undergraduate Programs

Classics

Music & Music Cognition

Social Work

French

Graduate Programs

Biomedical Engineering M.A.Sc., Ph.D.

Electrical and Computer Engineering M.A.Sc, M.Eng., Ph.D

Engineering Physics M.A.Sc, M.Eng., Ph.D

Chemistry and Chemical Biology M.Sc., Ph.D.

e-Health M.Sc.

Classics M.A., Ph.D.

French M.A., Ph.D.

Health Policy Ph.D.

Social Work M.S.W., Ph.D.

UNENE M.Eng.

Water Without Borders G.Dip

DRAFT FINAL ASSESSMENT REPORT
Institutional Quality Assurance Program (IQAP) Review
Peace Studies

Date of Review: November 19 - 20, 2019

In accordance with the University Institutional Quality Assurance Process (IQAP), this final assessment report provides a synthesis of the external evaluation and the internal response and assessments of the undergraduate and graduate programs delivered by the Peace Studies Program. This report identifies the significant strengths of the programs, together with opportunities for program improvement and enhancement, and it sets out and prioritizes the recommendations that have been selected for implementation.

The report includes an Implementation Plan that identifies who will be responsible for approving the recommendations set out in the Final Assessment Report; who will be responsible for providing any resources entailed by those recommendations; any changes in organization, policy or governance that will be necessary to meet the recommendations and who will be responsible for acting on those recommendations; and timelines for acting on and monitoring the implementation of those recommendations.

Executive Summary of the Review

In accordance with the Institutional Quality Assurance Process (IQAP), the Peace Studies Program submitted a self-study in October 2018 to the Vice-Provost, Faculty to initiate the cyclical program review of the undergraduate programs. The approved self-study presented program descriptions, learning outcomes, and analyses of data provided by the Office of Institutional Research and Analysis. Appendices to the self-studies contained all course outlines associated with the program and the CVs for each full-time member in the department.

Two arm's length external reviewers, one from British Columbia, one from Boston, USA and one internal reviewer were endorsed by the Dean, Faculty of Humanities and selected by the Vice-Provost, Faculty. The review team reviewed the self-study documentation and then conducted a site visit to McMaster University on November 19-20, 2018. The visit included interviews with the Provost and Vice-President (Academic); Vice-Provost, Faculty, Dean, Faculty of Humanities, Associate Dean (Academic), Director of the program and meetings with groups of current students, full-time faculty and support staff.

The Director of the program and the Dean of the Faculty of Humanities submitted responses to the Reviewers' Report (February 2019/June 2020). Specific recommendations were discussed and clarifications and corrections were presented. Follow-up actions and timelines were included.

The reviewers' report highlighted the strengths and potential of the program, as well as provided recommendations and suggestions for areas of improvement.

Strengths

The program strengths highlighted included:

- the program's curriculum is well-formulated, and its learning outcomes appear to have been reached at the global level.
- the student experience for Peace Studies seem to be "quite positive" and the program is "well-liked by its undergraduate major and minors."
- the Faculty is "clearly committed to the program success" and "showed a degree of passion for it which was admirable given how few resources they have to work with"

Areas for Enhancement or Improvement

The areas for improvement are largely reflected in the recommendations listed below, but included:

- An increase the number of full-time faculty to provide the program with identity and stability.
- A "large injection of financial resources to develop the program."
- Improvement in the marketing of the program inside and outside the university.
- Rebranding the program to make it more relevant to the needs of students and faculty.
- Implementation of faculty cross-appointment.
- Providing more information about the program to students.
- Agreement on where the Program is situated.

Summary of the Reviewers' Recommendations with the Department's and Dean's Responses

Recommendation	Proposed Follow-Up	Responsibility for Leading Follow-Up	Timeline for Addressing Recommendation
<i>Full Time Faculty:</i> "There clearly needs to be an increase in the number of full-time faculty to complement the sessional faculty. This would provide continuity and the opportunity for faculty to have a real stake in the program, its existence and survival" (...) "There needs to be at least 2 full time faculty to work on the program. This would not	We welcome the reviewer's recommendations and we recognize that the lack of full-time faculty and over-reliance on sessional instructors is a key shortcoming of our program. We agree with these observations and support their conclusion that the program needs at least 2 full time faculty . Without additional faculty, the	Director of Peace Studies Dean of Humanities	September 2019: (Contingent on resources availability)

necessarily require a huge amount if these faculty were hired at the assistant professor level. The continuity and consistency of this would be crucial though to the maintenance and continued existence of the program" (...) "There is, of course, as has already been noted, a serious shortage of full-time faculty... This has been a common trend through the review."	program cannot achieve its potential, and many of the improvements and enhancements actions will be limited. The Program of Peace will request the Faculty of Humanities to hiring of at least 2 full-time faculty (long term) and 2 contractually Limited Faculty (short term), to teach introductory and advanced courses in conflict transformation, sustainability, international law and international security as suggested by the reviewers. These new faculty will contribute in the short term to consolidate the program, performed currently under-resourced activities in teaching, administration, and marketing. A long- term strategic vision of the program is to transform Peace Studies into a stand-alone undergraduate department, and ultimately, to develop an interdisciplinary graduate program. We hope that with the hiring of new faculty and the injection of resources, we would be able to perform such a mission.		
<i>Resources:</i> "There is no doubt that programs in Peace and conflict studies are growing. We would suggest a large injection of financial resources is required to develop the program and promote it	We welcome the reviewer's suggestions and their optimism about the potential of growth of our program. We will submit a plan to the Dean of Humanities requesting funds to produce	Director of Peace Studies Dean of Humanities	May 2019: Submit promotional plan to the Dean September 2019: Implement plan

across Canada and internationally." (...) "One problem is the Program's overall... lack of resources to develop and promote and identity" (...) "The program suffers grammatically from underinvestment"	program-specific promotional materials to advertise our program at student recruitment fairs. The promotional materials will also be distributed to High School guidance counsellors.		
<i>Academic Home:</i> "There needs to be some agreement on where the Program is situated. If it could be situated in the social sciences program this might make more sense. It would provide the program with a stronger sense of identity."	We welcome the reviewer's suggestions, but no further action will be taken now for the considerations outlined above. We welcome re-opening discussions about transforming Peace Studies into a joint Humanities and Social Science if there is interest from the Faculties Social Sciences.	N/A	N/A
<i>Marketing Plan:</i> "The marketing of the program is very poor. We saw little attempt to actively market inside or outside the university. We were given a fairly standard brochure, that had relatively little creativity, but there are no apparent plans for how to make Peace Studies more broadly known. ...this would require some re-definition of the program perhaps along the lines of renaming it (Peace and Conflict studies might be an idea). It needs rebranding in one way or another"	We recognize the need to improve our marketing strategies inside and outside the University. In the short term, the Peace Studies Program will request to Dean of Humanities to: 1. Design and create dissemination marketing products targeted to specific audiences. 2. Provide funding to support the participation of Peace Studies faculties in academic fairs and visits to secondary institutions in our catchment area. 3. Create a bi-annual newsletter to promote news about the activities and research of the	Director of Peace Studies Dean of Humanities	May-June: Consult with faculty and students on marketing and promotional plan September 2019: Implement marketing plan

	Program and Center of Peace Studies. The inclusion of new full-time faculty member will facilitate the realization of these activities.		
<p><i>Rebranding:</i> “Rebranding of the program to make it more relevant to needs of students and faculty.... “The program needs to be rebranded to keep up with changing times. Perhaps Peace and Conflict Studies might be used. Whatever is used needs to reflect the content and curriculum. Students are attracted to programs because of their name etc., but the content must match up.”</p>	<p>We welcome and accept the reviewer’s suggestions concerning the rebranding of the Program. The question of rebranding the Program was raised as part of this self-study as one strategy to enhance the program's visibility. This is in line with the reviewer's suggestions. Based on the reviewer's recommendations, the Director will initiate the formal process to change the name of the program to “Peace and Conflict Studies” to better effect our current curriculum. A formal request to the Curriculum Committee, the first step of this process, will be submitted by October 2019.</p>	<p>Director of Peace Studies</p>	<p>October 2019: Submit request for program name change to Faculty Curriculum Committee</p> <p>September 2020: Implement program name change</p>
<p><i>Curricular Matters:</i> “There needs to be program level outcomes than can be matched to learning outcomes across the board for each of the courses in Peace Studies. This is so we can assess whether these are being met and there is consistency between these.” (...) “Greater emphasis on skills used in the field and how to</p>	<p>We welcome and accept the reviewers' recommendation for specific curriculum revision to align the program. The Director will work with instructors to better align degree Level Expectations (DLE) with Program Learning Outcomes (PLO) with emphasis on practical peacebuilding and conflict resolution skills</p>	<p>Director of Peace Studies</p>	<p>Ongoing: Director will work with instructors to match course learning outcomes with overall program learning outcomes</p> <p>September 2020: Revise program learning outcomes</p>

<p>resolve conflicts and create peaceful outcomes, support peacebuilding etc." (...)</p> <p>"This should see a reworking to stress the new threats and dangers to domestic and international peace, such as terrorism for instance, ethno-political violence and failed states among others..."</p>	<p>used in the field as recommended by the reviewers. Instructors will also be encouraged to work with the McPherson Institute on course resign and re-design. The hiring of full-time faculty will enhance this process as they will be involved in program curriculum development and provide new opportunities of growth. In addition, we will request hiring faculty with teaching and research interest in international security, as suggested by the reviewers.</p>		
<p><i>Student Information and Support:</i> "There needs to be a systematic and student-focused look at calendar copy, counseling and course availability for students in the program. Cohort building needs to be approached thoughtfully for this highly motivated group of students. The calendar copy for the experiential course needs a supplementary website giving practical details on how students can arrange a volunteer practicum experience." (...) "It is clear from the students' comments that when they tried to organize certain things they had little support to do so."</p>	<p>We recognize the need to provide more information to Peace Studies students. We will implement some the reviewers' suggestion by September 2019. We will provide clearer and more student-focused information in our website and calendar, particularly for experiential courses. Furthermore, we have put in place some additional strategies to provide more information and support to our students, including: 1. Supporting the Peace and Conflict Studies Association (PACS) as a way to connect students, strengthen the sense of identity and promote student initiatives. 2. Organizing regular meetings between Faculty and Students - "Meet the Profs" events,</p>	<p>Director of Peace Studies</p>	<p>September 2019</p>

	and a general meeting with peace studies students to hear their concerns, suggestions and questions. The appointment of full-time faculty members will provide new opportunities to improve communications with students. We plan to appoint a dedicated undergraduate Student Advisor responsible for curricular and career-oriented counselling to Peace Studies students and organising a bi-weekly Lecture Series.		
<i>Shared Space:</i> "Another problem identified is that there is no shared space for Peace Studies students. It was noted that graduate TA's typically use the space of the office of their home department, but undergraduates have nowhere to go. This creates a problem in a program that claims activism is a major part of the educational experience. It also means that there is no real physical space around which to create an identity."	We acknowledge the need of a shared space for Peace Studies Undergraduate Program. The Director of Peace Studies will work with the Dean to find suitable shared space for Peace Studies Teaching Assistants and students "around which to create an identity" and to perform institutional activities noted above, including the bi-weekly Lecture Series and cohort-building events.	Director of Peace Studies Dean of Humanities	September 2019 (Contingent on resources availability)
TA's: "Both students and sessionals indicated dissatisfaction with having TA's from other departments. The students felt that the TA's marking them had less	We recognize that the unavailability of TA's from our field might be an obstacle for students and instructors. As a provisional measure, a training document will be	Director of Peace Studies	April-May: Director consults with McPherson Institute on TA training workshop September 2019: Implement TA training

knowledge of the material. The sessionals found that TA's needed to use their hours of work on developing their knowledge, leaving few hours for actual marking."	prepared to aid new TA's to transition to Peace Studies. The Director will also work with the McPherson Institute to organise training workshops for TAs. Since Peace Studies does not have a graduate program, we will continue to rely on TA's from other departments. With the inclusion of new faculty and the growth of the program, we expect in the long term to have our own graduate program from which we can recruit specialized Peace Studies TA's for our courses.		Workshop
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Dean's Response, Faculty of Humanities:

Humanities' Peace Studies undergraduate program was reviewed in late 2018. The acting director, Dr. Bonny Ibhawoh submitted his response to the review in the spring of 2019. The outgoing dean, Dr. Ken Cruikshank, did not provide comment before leaving office on June 30, 2019. On July 1, 2020 I began my term as dean, and Dr. Chandrima Chakraborty began her term as Peace Studies Director. During the 2019-2020 academic year, Dr. Chakraborty and I have had several conversations about Peace Studies' future. This statement reflects the year's developments as well as provides commentary on the IQAP review and program response.

The reviewers noted that despite the lack of resources that have been invested in Peace Studies, the individual faculty members and the program's students remain committed to the program. That has remained the case since the IQAP review. Dr. Ibhawoh continues to be a committed advocate, and Dr Chakraborty has brought a renewed energy to the program. I wish to thank them both for their efforts.

Knowing that multiple tenure track hires are unlikely in Peace Studies, given the small number of program students and competing needs elsewhere, Dr. Chakraborty has decided to invest her time in a rethinking/rebranding of Peace Studies as a Humanities-based social justice program. As she knows, I support this direction. I believe an updated name would have greater purchase among today's students and provide more opportunities for expanding faculty involvement. We have many faculty members who currently teach and research in areas connected to social justice (critical race studies,

decolonization, community-engaged research, gender and class inequalities, environment and animal studies, Indigenous research, and medical humanities among others).

Dr Chakraborty has already mobilized others in the Faculty to explore changes, including, chiefly, Dr. Christine Quail, Acting Director of the Gender Studies and Feminist Research MA. I have offered money to hire an RA (summer/fall 2020) to assist them in their work: researching comparator programs, surveying students, liaising with MacPherson Institute about curricular reform, and more.

Dr. Chakraborty and I were also engaged in 2019/20 in the search for the next Hope Chair in Peace and Health. We had a very good search and have identified 4 possible candidates who could help guide these program changes, bring greater profile to the program at Mac (particularly in FHS) and in the Hamilton community, and provide some stability to the program as a permanent Peace St contributor. The pandemic has temporarily delayed the completion of the search, as the committee hopes to meet the finalists in the fall. If this is not at all possible, we will proceed virtually.

A third development this year was the physical move of Peace Studies to the 6th floor of CNH. Shifting the administrative support staff model did not go as smoothly as I had hoped, and I will admit that the difficulties encountered slowed Dr. Chakraborty's progress. However, I am optimistic that the new Peace Studies location, alongside the new Centre for Human Rights and Restorative Justice, will allow for joint programming (speakers, and other activities) and a greater sense of 'home' for the students. GSFR is also being relocated to CNH, and a joint lounge for both programs' students will be established. I believe that this location might solve some of the issues identified by the reviewers. While Dr. Chakraborty and I have had initial conversations with our colleagues and counterparts in FSS, I agree with Dr. Ibhawoh that at this moment a move to Social Science is not on the table.

2019-20 was a challenging year for Humanities. A new dean, two new associate deans, an acting Director of Administration and four new program directors and department chairs meant that there was a lot of learning to be done, but the groundwork has been set for some progress on the long-standing challenges plaguing Peace Studies. I look forward to continuing this work in 2020-21.

Quality Assurance Committee Recommendation:

McMaster's Quality Assurance Committee (QAC) reviewed the above documentation and the committee recommends that the program should follow the regular course of action with a progress report and subsequent full external cyclical review to be conducted no later than 8 years after the start of the last review.

FINAL ASSESSMENT REPORT

Institutional Quality Assurance Program (IQAP) Review

Classics B.A., M.A., Ph.D.

Date of Review: March 22 - 24, 2021

*In accordance with the University Institutional Quality Assurance Process (IQAP), this final assessment report provides a synthesis of the external evaluation and the internal response and assessments of the undergraduate and graduate programs delivered by the **Classics Department**. This report identifies the significant strengths of the programs, together with opportunities for program improvement and enhancement, and it sets out and prioritizes the recommendations that have been selected for implementation.*

The report includes an Implementation Plan that identifies who will be responsible for approving the recommendations set out in the Final Assessment Report; who will be responsible for providing any resources entailed by those recommendations; any changes in organization, policy or governance that will be necessary to meet the recommendations and who will be responsible for acting on those recommendations; and timelines for acting on and monitoring the implementation of those recommendations.

Executive Summary of the Review

The Classics Department submitted a self-study in January 31 2021 to the Vice-Provost, Faculty and Vice-Provost and Dean of Graduate Studies to initiate the cyclical program review of its undergraduate and graduate programs. The approved self-study presented program descriptions, learning outcomes, and analyses of data provided by the Office of Institutional Research and Analysis. Appendices to the self-study contained all course outlines associated with the program and the CVs for each member in the program.

Two arm's length external reviewers, both from Ontario and one internal reviewer were endorsed by the Dean, Faculty of Humanities, and selected by the Vice-Provosts. The review team reviewed the self-study and supporting documentation and then conducted a virtual site visit on March 22 - 24 2021. The visit included meetings with the Provost, Vice-Provosts, Dean, Associate Dean and faculty and students and members of the pertinent administrative units.

The Chair of the Classics Department and the Dean of the Faculty of Humanities submitted responses to the Reviewers' Report (June 2021). Specific recommendations were discussed and clarifications and corrections were presented. Follow-up actions and timelines were included.

Strengths

In their report (April 2021), the Review team noted that the department has demonstrated itself to be ahead of the curve in embracing new modes of delivery and online technology long before the onset of the pandemic and has introduced innovative initiatives in the teaching of both undergraduate and graduate students.

The reviewers highlighted the following strengths of the programs:

Highlighted strengths of the Classics Department are a spirit of teamwork and dedication to make the most of the available resources, “collegial volunteerism and entrepreneurial innovation”, continued development of online courses, international and experiential learning opportunities for both grad and undergrad students, new collaborative graduate programs with the University of Rome “La Sapienza,” and “an innovative new exam structure designed to increase the proportion of PhD students who complete the program on time without sacrificing the rigor of the exams.”

Areas for Improvement

The reviewers note that “we would like to stress that there is no area in which there is an urgent need for improvement or enhancement.” They do point out the challenge presented by imminent retirements and especially the impact this has on the proportion of undergraduate courses taught by permanent faculty and the threat this poses to our ability to offer a comprehensive range of supervision to graduate students.

Summary of the Reviewers’ Recommendations with the Department’s and Dean’s Responses

Recommendation	Proposed Follow-Up	Responsibility for Leading Follow-Up	Timeline for Addressing Recommendation
1. The department should work closely with the administration to ensure the maintenance of teaching and supervisory capacity in Ancient History.	The Chair will discuss this with the Dean.	Chair	July 2022
2. The reviewers encourage the administration to work closely with the Classics unit to address the	Since the report was made, one retirement has already happened. The Chair will work with the Dean to address the impact of	Chair	July 2022

implications for the program from the two impending retirements.	this and to plan for future retirements.		
3. The department should work with the administrative staff to compose a handbook outlining the responsibilities of the position of Administrative Assistant.	The Chair will inquire to find out the responsible parties here, i.e. whether the determination of the responsibilities of the Admin Asst. reside with the department or in the administrative sphere, whether such a guide might exist elsewhere, and who should compile one.	Chair	September 2021
4. The department should collect data over the next several years to assess the success of the new Greek and Latin comprehensive exam structure. While the first year of the new structure was highly successful, the small number of students in any one year makes it difficult to judge the success of the change after just one year.	The Department will collect this data and evaluate the success of the changes to the comp exam structure over the span of 3 years.	Graduate Advisor	May 2024
5. The department should look into the possibility of installing master copies with site licenses of specialized software programs onto a shared computer to	Provision of a dedicated computer room is probably not possible due to cost, but the department will work with individual students to ensure that their computer needs are met.	Graduate Supervisors, Grad Advisor	ongoing

which the graduate students could have evening and weekend access.			
6. If possible, the department should consider setting aside a space dedicated to graduate students.	The department provides all graduate students with an individual desk in a shared office; we will try to maintain this, but are unlikely able to expand the space provided to grad students beyond this.	Chair, Grad Advisor	ongoing
7. The review team suggests that the department consider instituting a series of pro-seminars for the graduate students to provide concrete advice on serving as a TA, teaching, publication, alternative academic or non-academic careers, etc.	This was the one recommendation the Department was surprised by, as we do offer an ongoing series of proseminars for the graduate students on similar topics (and in fact, two of these were led by grad students themselves in the past year). We will consult to see whether we can expand our offerings.	Grad Advisor	ongoing
8. The department should make an effort to collect data about the post-graduation employment of alumni of the PhD program.	The Department will make every effort to keep in touch with our graduates although it was noted that this is sometimes difficult, especially for those students who leave the academic field.	Grad supervisors, Grad Advisor	Ongoing
9. The review team suggests that the university administration support the department in its	The recommendation is aimed at the "university administration". We are keen to be supported in our international	"university administration", Chair	Ongoing

international initiatives in Italy, as they could potentially be expanded to offer opportunities to the university community beyond the Classics department.	endeavours.		
10. The department should consult with the Recruitment Coordinator and the Careers Officer to develop recruitment strategies and the development of careers-oriented professional skills for the undergraduate Classics programs.	These are newly created offices. We will consult with them on how to improve our recruitment and how better to provide career-oriented skills for our graduates.	Chair or designate	ongoing

Dean's Response, Faculty of Humanities:

The review team was correct to praise McMaster's Classics department. The reviewers' report notes in several places that the department has shown consistent creativity in its determination to serve the needs of its program students, those interested in Classics electives, its graduate students, and the faculty members' research agendas. According to the reviewers, the department's innovations may serve as models to Classics departments elsewhere. Some of these strategies include the creation of a high-enrolment elective course (Medical Terminology); the pre-pandemic development of online courses; the establishment of experiential education opportunities via researchers' archaeological digs and the international partnership with La Sapienza in Rome; the generation of revenue through Radix publishing that supports undergrad instruction in Classics; and the curricular reforms that seek to enable undergrad and graduate students to fulfill the demands of a rigorous Classics education, even if they got a late start learning Latin and Greek. I want to thank my colleagues in the department for all their efforts. Their willingness and ability to find solutions to the challenges they face should be commended – and it should not be taken for granted.

As the review and departmental response note, one retirement for July 2022 has been announced and a second will likely follow in a few years. As everyone in the Faculty knows, I cannot promise that all retirements will be replaced, but I am aware that the department is already very lean. We will work on a solution together. I would recommend that the idea of a handbook for administrative assistants and it makes sense to have a Faculty-wide template as a first step.

With respect to the specialized software for graduate students, the chair should speak with John Bell about equipment. Unfortunately, we don't have the resources to establish graduate lounges for all our programs at this time. As the department response notes, however, the Faculty has been and will continue to invest in new supports around alumni development and careers education for our undergrad students. I encourage the department to contribute to this work by maintaining and deepening all connections they have to past students and by encouraging undergrads to attend the workshops put on by our new Humanities careers manager. Our Associate Dean Grad Studies is also looking for new ways to connect the Faculty's graduate students with information on non-academic careers. Some of these efforts have been sidelined in 2020-21, but we look forward to more events in the future.

I believe the institution's administrators at the Faculty and University levels have been supportive of the new La Sapienza agreements, but if problems arise, the department chair and grad chair should be sure to reach out. We all want to see the new partnership enhance our current students' experiences and help the department recruit students in the years to come. To that end I would recommend that the chair connect with our communication manager to prepare some promotional stories for the newsletter and/or testimonials for the website featuring students who participate in the exchange.

In sum, there are no substantial areas of improvement recommended by the reviewers. The main challenge identified will be faculty renewal, and my colleagues in Classics will also want to track how their new language comprehensive exam structure works out. Early results look promising, but they will need to review results over the next three to five years.

Lastly, I would suggest that the department continue to think of ways to promote the undergraduate program in Classics. I recognize that in the current climate doing so can be a challenge, and as I've commented, the department has done well to grow its electives instead. But I would be remiss if I didn't take this opportunity to encourage the department to continue to pursue creatively new opportunities to promote the undergraduate major in Classics.

Quality Assurance Committee Recommendation:

McMaster's Quality Assurance Committee (QAC) reviewed the above documentation and the committee recommends that the program should follow the regular course of action with a progress report and subsequent full external cyclical review to be conducted no later than 8 years after the start of the last review.

FINAL ASSESSMENT REPORT

Institutional Quality Assurance Program (IQAP) Review

Music and Music Cognition

Date of Review: March 22 - 24, 2021

*In accordance with the University Institutional Quality Assurance Process (IQAP), this final assessment report provides a synthesis of the external evaluation and the internal response and assessments of the undergraduate Music programs delivered by the **School of the Arts**. This report identifies the significant strengths of the programs, together with opportunities for program improvement and enhancement, and it sets out and prioritizes the recommendations that have been selected for implementation.*

The report includes an Implementation Plan that identifies who will be responsible for approving the recommendations set out in the Final Assessment Report; who will be responsible for providing any resources entailed by those recommendations; any changes in organization, policy or governance that will be necessary to meet the recommendations and who will be responsible for acting on those recommendations; and timelines for acting on and monitoring the implementation of those recommendations.

Executive Summary of the Review

The School of the Arts submitted a self-study in January 2020 to the Vice-Provost, Faculty to initiate the cyclical program review of its undergraduate music programs. The approved self-study presented program descriptions, learning outcomes, and analyses of data provided by the Office of Institutional Research and Analysis. Appendices to the self-study contained all course outlines associated with the program and the CVs for each member in the program.

Two arm's length external reviewers, one from Manitoba and one from Saskatchewan and one internal reviewer were endorsed by the Dean, Faculty of Humanities, and selected by the Vice-Provost. The review team reviewed the self-study and supporting documentation and then conducted a virtual site visit on February 1 - 3 2021. The visit included meetings with the Provost, Vice-Provosts, Dean, Associate Dean and faculty and students and members of the pertinent administrative units.

The Director of the School of the Arts and the Dean of the Faculty of Humanities submitted responses to the Reviewers' Report (June 2021). Specific recommendations were discussed and clarifications and corrections were presented. Follow-up actions and timelines were included.

Strengths

In their report (April 2021), the Review team recognized the faculty's strengths in research and teaching and the interdisciplinary potential for new programs with STEM faculties.

The reviewers highlighted the following strengths of the programs:

Reviewers commented on the high quality performance spaces, the opportunities for STEM collaborations, and faculty research as strengths.

Summary of the Reviewers' Recommendations with the Department's and Dean's Responses

Recommendation	Proposed Follow-Up	Responsibility for Leading Follow-Up	Timeline for Addressing Recommendation
2. Implement the proposed STEM/Music B.Mus. degree ASAP	This is currently proceeding. Music, Science and Health Science were awarded a SAF to provide support for preparing the IQAP proposal.	Matthew Woolhouse is leading this proposal.	Proposal is due for Dean's approval October 2021
3. Appoint a minimum of 2 full time tenure track faculty music positions in: (A) Instrumental Conducting / Music Education and (B) Choral Conducting / Music Education.	Faculty feel strongly that faculty complemented be taken very seriously.	Dean of Humanities and Director of the School of the Arts	
3a. Develop on campus special event music activities such as annual honour concert band, jazz band, and choir weekend projects.	The music programs existing ensembles and choirs are quite active on campus (outside of the Pandemic). More could be done to promote to highschool students and alumni.	Led by ensemble and choir directors.	ongoing
3b. Work in consultation with local school-based music educators to develop and increase the musical abilities of local and regional high school music ensembles and make	Such collaborations are already in place in music, primarily led by the CLA and adjunct sessional faculty member. This work could be better cemented with full time faculty dedicated	Tracy Wong	ongoing

critical social and professional connections with McMaster University.	to these collaborations. More publicity and communication of these projects could also be mobilized on the website and through social media.		
3c. Adjudicating at local, regional and national music festivals	Some faculty have been doing this in the past (Golden Horseshoe festival) and faculty recognized they could do more as a recruitment strategy.	All faculty	ongoing
3d. Develop appropriate publicity and communication avenues between all regional pre university music teachers and individual applied teachers in your community and beyond as well	Music faculty are mobilizing a social media campaign spring 2021 based on data collected during auditions that demonstrates many students learn about the program via social media.	Andrew Mitchell and Tracy Wong	May 2021
3e. Develop regional pre university band, jazz and choir festivals <i>on campus</i>	Faculty felt that this would be difficult to manage and preferred to focus on collaborations with high schools at this point, as it is work that has already started and has proven successful.	n/a	
3f. Champion various interdisciplinary and intra-disciplinary ensemble-based performance projects with on campus STEM partners.	We assume this will emerge out of the STEM music program that is being developed.	Matthew Woolhouse	Future (once or as new degree is being rolled out).
3g. Champion various Canadian social justice issues and initiatives on	There have been discussions about an Indigenous music and	Matthew Woolhouse	Academic year 2021-2022

McMaster's campus. One of many examples to articulate this point is the UofS Jazz Ensemble's Truth and Reconciliation 500 Years Indigenous-focused concert.	dance course, with Rheanne Chartrand from the Museum. With a new Indigenous Studies director in place such conversations will resume. It is crucial that such projects be Indigenous-led.		
3h. Serve as B.Mus. student faculty advisors for McMaster B.Mus. students who wish to go on to pursue a career in school-based Music Education.	Currently faculty members do consult with students about required courses and career options. Faculty will use social media and other communication strategies to get this messaging out to students.	Andrew Mitchell	Academic year 2021-2022
3i. Start a McMaster alumni (not just B.Mus. alumni) band, jazz band and choir 'homecoming' projects and/or ongoing alumni projects	There is an existing alumni choir and they are in touch with Tracy Wong and are collaborating together.	Tracy Wong	ongoing
3j. Develop virtual concert videos	During the past year of the pandemic ensembles and choirs have been recorded and showcased on youtube. Faculty will continue to do this once they return to campus.	Ensemble and choir directors.	ongoing
3k. Develop music-area specific bi-annual e-newsletters (e.g. UofS Dept of Music newsletter	The launch of the music Instagram account fall 2020 will continue to be used to promote music events, open houses, concerts and other activities.	Tracy to lead	
3l. Develop in-person and/or virtual	Open houses are led by the faculty of	SOTA director and music faculty	ongoing

McMaster University B.Mus.-specific Open House events and/or weekends	humanities and each area from within SOTA participates annually including music. Music specific open houses (there were 3 in fall 2020) on zoom will continue to be developed. The virtual format allows students, teachers and counsellors to attend.		
4. Appoint a 3 rd full time tenure track music faculty position in the area(s) of jazz and/or contemporary/world music	See point 3 above. Crucial is balancing all priorities in music; TT should be able to contribute broadly to the full program.	SOTA director and Dean of Humanities	
5a. Develop 2-year course rotations model for all music techniques courses (e.g. Brass, Percussion, Woodwind) and selected upper year music electives and then publicly publish (which includes committing to) these course rotational models so that your current B.Mus. and non-B.Mus. majors alike can plan their courses for the next 2 years accordingly.	Faculty felt this was a good idea and will be meeting in May 2021 to draft a rotational schedule.	Matthew and Andrew to lead.	May 2021 (deadline by Curriculum time fall 2021)
5b. Encourage students performing violin, viola, cello, bass, flute, trumpet, clarinet to buy or rent their own instruments from a local retailer while maintaining McMaster's	Faculty felt this is also a good idea but want to caution not removing accessibility issues to students who don't have access to instruments.	SOTA director and Manager of Operations	Academic year 2021-2022

compliment or rarer and/or specialized instruments (i.e., bass flute, oboe, bassoon, all percussion, bass trombone, tuba, etc.).			
6. Appoint a <i>music</i> faculty member (<i>not support staff from SOTA</i>) to have governance over hiring and pedagogical management of all hourly music instructors.	While the staffing of the hourly instructors is lead by SOTA admin team, music faculty will develop a kind of “code of conduct” and equity training for instructors.	Andrew take the lead and then work with SOTA director.	For summer 2021
7. Allow for and facilitate on-campus instrument-specific (including voice) master classes, given by applied teachers (hourly and where appropriate full time) and make these evening and weekend master classes open to the general public (living or virtual).	This year a donor provided funds for a series of master classes for the ensembles. If funding continues faculty felt they were highly successful and could be opened up to the public as well.	Music faculty	ongoing
8. Consider developing a for profit pre university conservatory of music area that would be active on weekends, evenings and the summer	Faculty felt if donor funds could be realized a summer camp would be a great idea.	Tracy lead	Summer 2022
9. Create incentive structures for all programs within SOTA to benefit through <i>rewarding</i> the creation of unique and attractive innovative service and core course programming. Do this by awarding a portion	Faculty would like a sense of if they have large numbers in service courses how that is reflected in allowing/enabling some of the smaller upper year courses.	SOTA director	ongoing

of all service teaching back to the program said teaching ultimately comes from			
10. Appoint a clear administrative & governance music leader, a person with music-specific experience, to coordinate all things B.Mus.-related on a daily operations and general long term planning basis.	Faculty recommended appointing a music faculty as assistant director who would have a vote at DAC and assist the director with overseeing the music program.		

Dean's Response, Faculty of Humanities:

Faculty complement: It is the case that the reviewers recommend 2-3 TT hires over the short term to support the B. Mus program. This is quite common in IQAP reviews. The Faculty, unfortunately, is not currently growing its faculty complement, nor is it, I'm afraid, keeping up with retirements and departures. That reality aside, the current faculty cohort is able to cover the program's needs, and the program review seemed to indicate that new TT faculty were needed primarily to run outreach efforts. As the program response indicates, the Music faculty already engage in a fair amount of outreach. More could be done, for sure, but we will need to think of other ways to strengthen existing outreach and introduce new efforts than new TT lines at the present time.

Declining enrollments: as noted above, I agree we may wish to think about whether we are maximizing our outreach and recruitment efforts. We have only recently hired a full-time recruitment officer in the Faculty and Communications Manager. We can certainly leverage their expertise, along with the efforts already underway in Music to get the word out more. I'm glad to hear the Music faculty discussed the launch of a social media campaign this spring, and I was very impressed by Joe Resendes' virtual concert that brought high school musicians together with the McMaster Concert Band. The new SOTA director has lots of good ideas and experience when it comes to engaging with schools and community groups. I am sure she will work with the Music faculty on some new recruitment initiatives that reflect their interests.

All that said, I felt the external reviewers downplayed the significance of the new SAF-funded B.Sc/B. Mus and B. HSc/B. Mus degree combinations that we are currently working on in the Faculty, under the leadership of Prof. Matthew Woolhouse. We are hopeful that these new combined honours offerings will be of interest to some of the same students who participate in our ensembles but currently major only in STEM and Health disciplines. I want to thank Dr. Woolhouse for his work on this cross-Faculty initiative and look forward to

seeing the outcomes. Promotion of this new option will be important when the time comes. An international certificate in music cognition currently under discussion, offering international experience to students, might further bolster the profile of the program and strengthen recruitment.

In tandem with these efforts to rework the B. Mus degree to make way for combined options with STEM program students, I recommend that Music faculty also work with Associate Dean to think of additional ways to open the stand-alone B. Mus program to afford greater access to more students and further interactions with other programs in the Humanities

Additional recommendations and comments:

- I was happy to see the reviewers recommend that we can cut back on the number of instruments that we purchase, maintain and store for student use. I recognize that some of the less common instruments should still be provided for by the Music program.
- I support the course rotation idea if it would benefit students, though the assistant dean should be consulted, to make sure the plan does not inadvertently create inflexibilities. While a rotation should support student planning, we will need to make clear that alterations are sometimes unavoidable.
- I support greater engagement around social justice causes. What I would recommend, however, is that the Music faculty and SOTA director think about how Music can work with other SOTA and/or Humanities faculty on such projects. There is no need to duplicate efforts, and the impact will be greater by combining ideas and energy.
- Relatedly, I did not see any reference to other forms of collaboration within SOTA and only one reference to Music-related faculty researchers outside of SOTA in either the external review report or the program response. I recognize that the focus of the review is on
- The B. Mus alone, but one way of strengthening the B. Mus is to leverage relationships with others. I applaud the B. Mus/STEM proposals for this reason. I would therefore also recommend that the 3 permanent faculty and SOTA Director work on deepening relationships within SOTA and between Music faculty and other music-adjacent faculty in Humanities and other Faculties (music cognition), to maximize outreach, recruitment, research and teaching activities.
- One item that I did not see reference to in the program's response was the reviewers' recommendation that ensemble members in other programs be charged a participation fee. There is a substantial cost to the Faculty to run the ensembles, and other Faculties regularly charge fees for learning and co-curricular experiences with success. Clearly other Music programs do it for ensembles, according to the external reviewers.
- **Finances:** Associate Dean Corner, in particular, has worked hard over the last two years to communicate with the Music faculty about the Faculty's budget and how it works. This communication has aided the development of the new B. Mus/STEM proposals, for example. We will continue to educate all members of the Faculty about the financial situation. As part of this effort, the annual costing exercise begun

under the previous dean is expected to resume after a hiatus owing to staff leaves and the pandemic.

- **Governance:** there is no voting at DAC, it is an advisory council. I have full confidence that the Director of the School can adequately represent the needs of all faculty members in her unit. She should, of course, maintain open communication within the School to facilitate her representation of all interests and needs of its members.

Quality Assurance Committee Recommendation:

McMaster's Quality Assurance Committee (QAC) reviewed the above documentation and the committee recommends that the program should follow the regular course of action with a progress report and subsequent full external cyclical review to be conducted no later than 8 years after the start of the last review.

FINAL ASSESSMENT REPORT

Institutional Quality Assurance Program (IQAP) Review

School of Social Work

Date of Review: April 5th and 6th, 2021

In accordance with the University Institutional Quality Assurance Process (IQAP), this final assessment report provides a synthesis of the external evaluation and the internal response and assessments of the undergraduate and graduate programs delivered by the School of Social Work. This report identifies the significant strengths of the program, together with opportunities for program improvement and enhancement, and it sets out and prioritizes the recommendations that have been selected for implementation.

The report includes an Implementation Plan that identifies who will be responsible for approving the recommendations set out in the Final Assessment Report; who will be responsible for providing any resources entailed by those recommendations; any changes in organization, policy or governance that will be necessary to meet the recommendations and who will be responsible for acting on those recommendations; and timelines for acting on and monitoring the implementation of those recommendations.

Executive Summary of the Review

In accordance with the Institutional Quality Assurance Process (IQAP), the School of Social Work program submitted a self-study in March 2021 to the Vice-Provost, Faculty and Vice-Provost and Dean of Graduate Studies to initiate the cyclical program review of its undergraduate and graduate programs. The approved self-study presented program descriptions, learning outcomes, and analyses of data provided by the Office of Institutional Research and Analysis. Appendices to the self-study contained the CVs for each full-time member in the department.

Two arm's length external reviewers and one internal reviewer were endorsed by the Dean, Faculty of Social Sciences, and selected by the Vice-Provost, Faculty and Vice-Provost and Dean of Graduate Studies. The review team reviewed the self-study documentation and then conducted a review on April 5th and 6th, 2021. The review included interviews with the Provost and Vice-President (Academic); Faculty Dean, Vice-Provost, Faculty, Vice-Provost and Dean of Graduate Studies, Associate Dean, Graduate Studies and Research, Associate Dean, Academic, Assistant Dean Director of the School of Social Work and meetings with groups of current students, full-time faculty and support staff.

The Director of the School and the Dean of the Faculty of Social Sciences submitted responses to the Reviewers' Report (June and July 2021). Specific recommendations were discussed and clarifications and corrections were presented. Follow-up actions and timelines were included.

External reviewers recognized:

- The “quality and dedication” of faculty and staff at the School, their “commitment to students, to the community, and to excellence”; the strengths of faculty members’ programs of research and educational leadership; the pride expressed by students, alumni and community partners about their association with the School
- The School’s “foresight and... alignment” with directions taken by key partners and stakeholders (CASWE, the University, and the Faculty of Social Sciences) and its “commitment to being forward thinking, always intent on responding to the changing, emerging needs of the wider community.”
- The “extensive experimentation and innovation” the School has demonstrated in evolving its undergraduate program, including the introduction of the Honours BSW degree, enhanced inclusion of Indigenous content and ways of knowing in undergraduate courses, creation of an Indigenous pathway in the BSW degree, creation of the Preparing for Critical Practice in Child Welfare (PCPCW) pathway, and the Community-University Policy Alliance on Gender-based Complex Homelessness. “These are both necessary directions for post-secondary programs in social work and offerings that have compelling relevance for the community.”
- The introduction of an MSW in Critical Leadership (MSW CL) and two new graduate diplomas (Community-Engaged Research and Evaluation (GD CERE) and Critical Leadership (GD CL)): these programs “are particularly exciting, as they are directly relevant to community needs at both the regional and national levels.”
- The School’s PhD students are “both highly capable and well-supported,” successful in funding competitions, and filling academic and sector-specific positions across Canada.

Areas for improvement:

- Further work to integrate equity, diversity & inclusion into undergraduate programs, delivery models and governance, and to ensure that faculty with lived experience of complex issues have an opportunity to provide leadership and teaching in relevant courses/ that the School and its instructors reflect the populations they work with and serve.
- Undergraduate students “bring less professional experience, more diverse learning needs, and more complexity than seen in past years. This means they require more supports—including field education and mental health supports.”
- The Graduate Diplomas: “With continued evolution, marketing and support they could become programs subscribed by students from across the country.” Currently, however, the sustainability of the Graduate Diplomas is in question.
- “The collective and individual sustainability” of faculty and staff members’ current work. “The faculty complement is 0.5 FTE lower than in 2014 despite significant program growth and increasing student demands”; faculty and staff members’ “passion and dedication can mask the impacts of workload demands.” The reliance on sessional instructors has increased, and “while

these colleagues are invaluable at every school, their availability and ability to help build and sustain a school is limited.”

More specific areas for improvement described in the report are directly reflected in the recommendations, discussed below.

Implementation Plan

Please outline the recommendations made by reviewers and indicate how you plan to address the recommendations in the chart below.

Recommendation	Proposed Follow-Up	Responsibility for Leading Follow-Up	Timeline for Addressing Recommendation
Continue to focus on goals of Equity, Diversity, and Inclusion (EDI).	Prioritize equity goals in upcoming faculty hire (and continue to integrate EDI 'inclusive excellence' process in all hiring)	Director	Upcoming academic year
	Through the Social Work Practice Learning Platform, curate and develop curriculum resources that attend to equity and identity (especially in micro practice).	Undergraduate Chair	Three-year horizon
Continue to review the Field Education program to ensure there are adequate supports and that the School continues to respond to the rapidly changing and complex needs of the communities, placements, and students	Building on the review initiated through this self-study, consult colleagues in the field regarding the needs of communities, goals for placement-based learning, and factors in student success. Present results of the review, resource implications recommendations to the Dean.	Director and Field Education Coordinator	Summer 2021
Continue to review recruitment strategies for attracting undergraduate and graduate students	Review and strengthen approaches to recruitment and support for Indigenous students	Chair, Circle for Indigenous Social Work Action (CISWA) supported by Administrator	Summer 2021 & upcoming recruitment cycle

Continue to review/strengthen BSW, MSW, and graduate diploma curricula	<p>Review curricula of BSW and MSW for attention to Indigenous knowledge, methodologies and histories – draw on the forthcoming <i>Indigenous Education Primer</i></p> <p>Pilot a co-teaching model in SW 2BB3 (2022/ 23 year) as one approach to addressing decolonization, equity, and diversity</p> <p>Initiate discussion with Experiential Education and MacPherson Institute colleagues, and Associate Dean, about an emerging partnership with Mission Services and the potential to develop a community-based teaching site with multiple placement opportunities</p> <p>In consultation with the Associate Dean, develop a proposal to sustain the <i>Preparing for Critical Practice in Child Welfare Pathway</i> (including formal designation and required resources), for presentation to FSS Undergraduate Curriculum committee & Dean.</p> <p>Further develop the Social Work Practice Learning Platform (including: consider curriculum development in areas identified in review: ‘on the ground’ advocacy/ change skills, documentation skills, death and bereavement, post-colonial social work practice)</p>	<p>Undergrad and Grad Chairs in collaboration with Chair of CISWA</p> <p>Director (proposal to Dean for teaching resources)</p> <p>Director</p> <p>Director</p> <p>Undergrad and Grad Chair, and Field Education Coordinator</p>	<p>Three-year horizon</p> <p>Late fall 2021</p> <p>Summer 2021</p> <p>Summer 2022</p> <p>Ongoing</p>
Continue to promote student wellness	<p>Further develop analysis of and approaches to self-care in BSW curriculum</p> <p>Discussion about students’ mental</p>	Undergraduate Chair	Two-year horizon

	health (especially in pandemic) as regular agenda item at faculty meetings	Director	Upcoming academic year
Expand and refine supports for students with diverse accessibility and (dis)ability learning needs	<p>Confirm capacity and process for the <i>Faculty of Social Sciences Liaison to Student Accessibility Services</i> to support BSW & MSW placement accommodations</p> <p>Support instructors to take up recommendations in the FlexForward guide for accessibility in the remote teaching & pandemic context</p>	<p>Director in consultation with FSS Liaison and Dean</p> <p>Director</p>	<p>Summer 2021</p> <p>Upcoming academic year</p>
Continue to refine MSW programs, examining in particular issues related to curriculum design, scheduling, and recruitment.	<p>Review MSW programs for opportunities for online and blended teaching and learning</p> <p>Review recruitment: consider an approach that recognizes strength of applicant pool for MSW CL, and challenges in MSW CA</p> <p>Seek out leadership placement opportunities in clinical contexts</p>	<p>Graduate Chair</p> <p>Graduate Chair</p> <p>MSW Field Education Co-ordinator</p>	Two-year horizon
Review and refine the positioning and structure of Graduate Diplomas within the School's graduate programs.	Building on the self-study, undertake a review of the Graduate Diplomas: purposes, current audiences, opportunities presented by remote learning, new delivery arrangements and structures (e.g. micro-credentials that ladder to MSW), funding models (especially in light of new corridor funding arrangements), resources required for sustainability.	Director, in consultation with Graduate Chair, GDip CERE program facilitator & Associate Dean Grad Studies & Research	Recommendations Summer 2022
Continue to review PhD student experience	Review attrition and times to completion to determine if program changes to support student success are merited	Director, with Graduate Chair	Summer 2021
Continue to be	As part of CASWE self-study, initiate	Director and	CASWE self-study

proactive regarding faculty and staff wellness	<p>formal conversation with faculty and staff to assess well-being as program growth and increasing complexity make their roles more demanding.</p> <p>In CASWE review, identify steps to protect well-being and balance demands and identify required adjustments to faculty and staff numbers.</p>	Administrator	this summer and fall; external review Spring 2022
Encourage the inclusion of student voices by fostering student caucus participation within governance and decision-making structures	Review processes for seeking student input into governance and decision-making; consider designated spots for members of caucus groups	Undergraduate Chair	Two-year horizon
As a School, review the University's commitment to Internationalization and explore stronger action to be better aligned with this particular direction reflected in the institution's strategic plan	Consult with faculty members with interest/ expertise in internationalization; consider alignment with the University's Internationalization commitments, and any actions to foster greater alignment	Director	Two-year horizon

Faculty Response

The Dean thanked the reviewers for their thorough review and thoughtful recommendations regarding how to enhance the educational programs of the School of Social Work, noting the recommendations will be helpful to both the School and the Dean in the coming years as they work to strengthen the programs.

The reviewers offer high praise for the School and its educational programs. The review notes that the School is forward-thinking and responsive to the needs of the community, making it a leader among Schools of Social Work in Canada. The reviewers highlight the commitment and dedication of all faculty and staff to provide a high-quality education to its students, and emphasize the innovation and experimentation undertaken by the School in response to both recommendations from the 2014 IQAP review and changes in

the broader environment in which the School operates. Of particular note is the development of programming to respond to calls by the Truth and Reconciliation Commission, new pathways that address challenging areas of social work practice such as child welfare, and new programs that serve needs for life- long learning and alternative pathways for pursue graduate education in social work. The School's faculty are research leaders in Canada. The School is recognized by all as fostering a strong collegial environment that supports consensus decision-making and effective governance. Overall, the review offers a strong endorsement of the current work of the School while offering recommendations for further enhancing its programs.

Most of the recommendations focus on areas already identified by the School as needing attention, and the review offers helpful, creative options for the School to consider in addressing them. The Dean noted in particular the increasing challenges with respect to field placements, due both to students who are less prepared than in the past (due to more limited life experiences) and the increasingly competitive context for arranging placements, which requires finding placements outside the traditional types of organizations. The School has and will continue to devote resources to address these challenges. The School has long focused on issues of EDI, Indigenous Strategies, and social justice, sensitive to the need to integrate such perspectives into both learning settings and in the practices of the School. The School has clear plans for deepening this work. And the School has already begun re-thinking the design and role of its still relatively new diploma programs in response to its experience thus far. The Dean reviewed the School's response to the review recommendations and discussed the response with the School Director. The response is thorough, responding to each of the recommendations offered, and outlines realistic actions that can be taken to address each of them effectively. The School is committed to meaningful change in each area, and we have already agreed on some areas that require resources from outside the school, such as enhanced support for the field education programs. The Dean was fully satisfied with the School's response and looked forward to working with its members in the coming years to implement the recommendations.

Quality Assurance Committee Recommendation

McMaster's Quality Assurance Committee (QAC) reviewed the above documentation and the committee recommends that the program should follow the regular course of action with a progress report and subsequent full external cyclical review to be conducted no later than 8 years after the start of the last review.

FINAL ASSESSMENT REPORT

Institutional Quality Assurance Program (IQAP) Review

French B.A., M.A., Ph.D.

Date of Review: May 3 - 4, 2021

*In accordance with the University Institutional Quality Assurance Process (IQAP), this final assessment report provides a synthesis of the external evaluation and the internal response and assessments of the undergraduate and graduate programs delivered by the **French Department**. This report identifies the significant strengths of the programs, together with opportunities for program improvement and enhancement, and it sets out and prioritizes the recommendations that have been selected for implementation.*

The report includes an Implementation Plan that identifies who will be responsible for approving the recommendations set out in the Final Assessment Report; who will be responsible for providing any resources entailed by those recommendations; any changes in organization, policy or governance that will be necessary to meet the recommendations and who will be responsible for acting on those recommendations; and timelines for acting on and monitoring the implementation of those recommendations.

Executive Summary of the Review

The French Department submitted a self-study in April 2021 to the Vice-Provost, Faculty and Vice-Provost and Dean of Graduate Studies to initiate the cyclical program review of its undergraduate and graduate programs. The approved self-study presented program descriptions, learning outcomes, and analyses of data provided by the Office of Institutional Research and Analysis. Appendices to the self-study contained all course outlines associated with the program and the CVs for each member in the program.

Two arm's length external reviewers, both from Ontario and one internal reviewer were endorsed by the Dean, Faculty of Humanities, and selected by the Vice-Provosts. The review team reviewed the self-study and supporting documentation and then conducted a virtual site visit on May 3 - 4 2021. The visit included meetings with the Provost, Vice-Provosts, Dean, Associate Dean and faculty and students and members of the pertinent administrative units.

The Chair of the French Department and the Dean of the Faculty of Humanities submitted responses to the Reviewers' Report (September 2021). Specific recommendations were discussed and clarifications and corrections were presented. Follow-up actions and timelines were included.

Strengths

In their report (June 2021), the Review team noted that the department is playing a key role in training students in one of Canada's two official languages.

The reviewers highlighted the following strengths of the programs:

According to the external review team, the department of French's fundamental strength is its student-centered vision and mission. On the teaching front, we prepare graduates to think, work and actively participate in the evolving political and cultural environments of the 21st century, but in French. Our graduate and undergraduate programs combine the intellectual agility and other benefits of cultural knowledge and competencies in French within an overall rich liberal arts learning experience. We work to foster our students' critical awareness to develop conceptual problem-probing as well as community engagement, specifically evidence of the ability to challenge socialized ideas and dialogue from multiple perspectives. These goals are among the key features of our dual umbrella theme "Francophonie et Diversité".

Areas for Improvement

In their report, the IQAP reviewers identify, in addition to its ten recommendations, four areas in which the Department of French could introduce improvements to our undergraduate and graduate programs.

1. *Creation and Implementation of a Placement Test for entering Level 1 Students.*
2. *More curricular offerings at the undergraduate and graduate levels.*
3. *Curricular Revisions*
4. *Review Departmental Committee Structure and Meetings Schedule*

Summary of the Reviewers' Recommendations with the Department's and Dean's Responses

Recommendation	Proposed Follow-Up	Responsibility for Leading Follow-Up	Timeline for Addressing Recommendation
Faculty who retire in the next 3-5 years must be replaced at a one for one ratio (1:1)	The department concurs and the chair will consult with Dean.	Dean, Faculty of Humanities.	3-5 years
Administrative assistant position should be made full-time, at the latest, with the return to campus. Some of the tasks that currently	The department concurs and the chair will consult with Dean.	Dean, Faculty of Humanities.	Immediately

fall to the administrative coordinator could be passed on to the administrative assistant (for instance, assigning TAs to faculty or courses, assisting the head, and the graduate and undergraduate chairs, etc.).			
A greater number of language sections taught by part-time faculty or graduate students.	The department concurs but there are issues related to collective agreements with MUFA and CUPE that will slow or deter implementation.	Dean, Faculty of Humanities and other concerned parties.	Ongoing
Consider hiring 1-2 full-time language instructors and / or a faculty member specialized in second- language pedagogy.	The department concurs and the chair will consult with the Dean.	Dean, Faculty of Humanities.	Ongoing
Class size in language courses should be decreased to 30 students.	The department concurs and the chair will consult with Associate Dean and Dean.	Dean and Associate Dean, Faculty of Humanities.	2022-2023
Consider renewing or converting the position currently held by a postdoctoral fellow to ensure ongoing development and enhancement of the	The department concurs and the chair will consult with the Dean.	Dean, Faculty of Humanities.	Ongoing

language courses.			
The creation of a first- year level course that would welcome specifically students from 11-12th Grade Core and separate French 1Z06 by levels: one for beginners up to Grade 10 core, one for 11/12 grade core students and another one just for the French immersion students.	The department has addressed this issue with its significant curricular reforms and the implementation of a new placement test (<i>Ev@lang</i>) that will assign students to the appropriate level: A1, A2, B1, B2.	Chair, and undergraduate chair, French language courses revamping <i>ad hoc</i> committee.	Ongoing
Consider making one business French course available as part of the French degrees to French majors and minors.	This recommendation has been addressed by opening these courses to students minoring or majoring in French.	Chair, undergraduate chair, undergraduate committee, and the Academic Advising Office.	Complete
Consider offering a few more courses at the 3rd- 4th year level; possibly offer 1-2 courses in French linguistics. (Some students said that they were required for some education programs.)	French education programs require that students be taught in French and the Chair will pursue discussion with Chairs and Dean on how best to meet this need.	Chair, Dean of Faculty of Humanities.	2021-2022
Consider ways for graduate students to explore career paths outside of university teaching. (This might be done at the Faculty of Humanities	The department is moving on this recommendation and the chair will consult with relevant parties to offer more volunteer and	Chair, graduate chair French, Associate Dean of graduate studies, Faculty of Humanities (Internship Coordinator) and	6-12 months

level, given that alternative career paths are relevant to many graduate students in the humanities.)	employment opportunities.	other university services.	
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Dean's Response, Faculty of Humanities:

The Dean is happy to see that the review team recognized the steps that have been taken since the last review to update and rationalize the undergraduate curriculum, headlined by the introduction of the European standards, known as DELF. With the help of an SAF-funded postdoctoral fellow, the new curriculum is now on offer, and we hope that students will see the advantages of a certificate for French achievement that is recognized internationally. We will want to monitor the impact of the new curriculum over the next several years. The Dean recommends that the Department continue to gather data from students via an exit survey, or other mechanism and also recommends that the Department work with the Communications manager to regularly promote the advantages of our new DELF pedagogy.

With respect to the implementation table provided the Department's response, there are several ideas that the Department notes have already been achieved. The call for a commitment to replace all retired faculty members is premature, as I know of no impending retirements in French. When retirement plans are made official, the Dean will consider the possibility of an appointment. In the meantime, the Dean remains open to all opportunities.

The Faculty's Director of Finance and Administration has been working closely with the Admin Coordinator and Chair in French on a staffing solution. It is a priority of the Chair to have an AA with native French ability, and the Dean has committed to that request.

With respect to the level I curriculum, the reviewers' recommendation appears to involve a misunderstanding: 1Z06 is for students with only grade-10 French. Currently, students with grade 12 are admitted to 1A06/2M06, whereas students with only grade-11 have to take 2Z06 first and students with only grade-10 have to take 1Z06 and 2Z06 before 1A06/2M06, which is required for the major. 1A06/2M06 is a problem, not only because the level of French required for entry to the program is so high (such that students without grade-12 can't become majors and graduate in 4 years), but also because it serves as a prerequisite for any student wishing to take higher-level courses. Further, even for students with grade-12, the gap between Immersion and Core students leads to many of the latter dropping 1A06. The placement test seeks to address this by redirecting weaker students with grade-12 to 2Z06, thus in fact increasing the number of students who face extra hurdles.

To address the problem the reviewers rightly identify that the department needs to think of ways to open access to the major—and indeed to courses—to students without such a high level of French (e.g., remove 2Z06 while making 1Z06 more robust and/or admitting students achieving high grades in 1Z06

and/or 2Z06 to the major without requiring them to take 1A06/2M06, or at least without requiring an extra 6 units by splitting 1A06/2M06 into two 3-unit courses—itsself facilitating access—and allowing students to place directly into the second).

There are several recommendations that the reviewers make with respect to hiring instructors, class size and program numbers. It is worth noting, however, that 1Z06 is the only course in which enrolment exceeds 50 in a section, though in most cases intake is less than 30. Enrolments in 1A06 last year were 39, 37, 43, & 20. It is also the case that 2020-21 was the first year in which the number of sections of 1A06 was reduced from 5 to 4, and this shift has not resulted in an increase in class size, while the number of sections of 1Z06 was increased from 2 to 3 (to facilitate the new pedagogical approach), reducing class size. Therefore, the claim that these changes have diminished program enrolments is unwarranted, given that they only went into effect last year. Similarly, the claim that there has been a net cut to the resourcing of the program is also inaccurate, as one fewer 1A06 section must be viewed alongside the addition of one new 1Z06 section.

There was also a recommendation to add more upper year courses to the annual offerings. The Dean recognizes that this has been a desire of the department for a few years, but it is important that we recognize the following. It is true that the department agreed to reduce the level-3 requirement by 3 units in order to meet the expanded resource demands of the curriculum owing to new pedagogy, reducing the required total program units to 51. However, that total is still higher than most Humanities programs. It also remains difficult to see a need for more level-3 and -4 courses when enrolments in half of these are below 15 (with only a couple of courses exceeding 30). Moreover, since no honours student needs more than 17 units in each year (51/3), there is a reasonable amount of choice: we have 27 at level 2 and 15 at levels 3 & 4, for a total of 57 units. Given that some courses are available on rotation and that students can take electives across different levels, the total number of choices is even greater than those numbers indicate.

The Dean commends the department for opening up the Professional French courses to majors and minors. (Presumably the reviewers mean Professional not Business French). The Department's decision is welcome. But the problem is that the certificates attract few students because Essential French requires three 6-unit courses and 1A06/2M06 is a prerequisite for Professional French 1. If professional French could be taught at a less advanced level such that students with only grade-12 could enroll in Professional French 1, the professional French courses would be likely to attract more students (and further French would still be required for the certificate). The department needs to consider that 6-unit courses have become quite rare on campus, especially in our Faculty. Requiring three 6-unit courses makes scheduling very difficult for students. If the department agrees that the name "Essential French" should be changed, we could pursue other options, though the Dean would also recommend a review of the certificate requirements.

With respect to career readiness, the Dean recommends that the Chair speak to the manager of career and experiential programs to ensure that she is also seeking French-language internships or post-graduation jobs in the Hamilton area. The Dean also agrees that the Department should do more to help its graduate students consider and prepare for non-academic careers. The Department's Graduate Director should raise this issue when the Associate Dean Graduate Studies next brings all the Graduate Directors together.

Quality Assurance Committee Recommendation:

McMaster's Quality Assurance Committee (QAC) reviewed the above documentation and the committee recommends that the program should follow the regular course of action with a progress report and subsequent full external cyclical review to be conducted no later than 8 years after the start of the last review.

FINAL ASSESSMENT REPORT

Institutional Quality Assurance Program (IQAP) Review

Biomedical Engineering, M.A.Sc. and Ph.D.

Date of Review: March 2nd and 3rd

In accordance with the University Institutional Quality Assurance Process (IQAP), this final assessment report provides a synthesis of the external evaluation and the internal response and assessments of the graduate programs delivered by Biomedical Engineering. This report identifies the significant strengths of the program, together with opportunities for program improvement and enhancement, and it sets out and prioritizes the recommendations that have been selected for implementation.

The report includes an Implementation Plan that identifies who will be responsible for approving the recommendations set out in the Final Assessment Report; who will be responsible for providing any resources entailed by those recommendations; any changes in organization, policy or governance that will be necessary to meet the recommendations and who will be responsible for acting on those recommendations; and timelines for acting on and monitoring the implementation of those recommendations.

Executive Summary of the Review

In accordance with the Institutional Quality Assurance Process (IQAP), the School of Biomedical Engineering submitted a self-study in January 2021 to the Vice-Provost and Dean of Graduate Studies to initiate the cyclical program review of its graduate programs. The approved self-study presented program descriptions, learning outcomes, and analyses of data provided by the Office of Institutional Research and Analysis. Appendices to the self-study contained all course outlines associated with the program and the CVs for each full-time member in the department.

Two arm's length external reviewers and one internal reviewer were endorsed by the Deans, Faculty of Engineering and Health Sciences, and selected by the Vice-Provost and Dean of Graduate Studies. The review team reviewed the self-study documentation and then conducted a remote review on March 2nd and 3rd, 2021. The review included interviews with the Provost and Vice-President (Academic); Vice-Provost and Dean of Graduate Studies, Deans of the Faculties, Associate Deans Grad Studies and Research (Engineering and Health Sciences), Co-Directors of the School and meetings with groups of current students, full-time faculty and support staff.

The Co-Directors of the School and the Deans of the Faculties of Engineering and Health Sciences submitted responses to the Reviewers' Report (June and July 2021). Specific recommendations were discussed and clarifications and corrections were presented. Follow-up actions and timelines were included.

Strengths

- An excellent innovative interdisciplinary Biomedical Engineering program, with milestones which are consistent with most research-intensive engineering graduate programs in Canada
- High-achieving student population with excellent calibre of faculty
- Excellent core courses along with other options for elective courses
- Excellent annual BME symposium
- A unique and excellent communication retreat for students
- Very strong research productivity and grant funding of the participating faculty
- Students adequately meet publications criteria expected from Masters and PhD students
- Uniformly positive assessments of the Co-Directors' dedication to program success

Areas for Enhancement or Improvement

- Expansion of supervisory committee membership to include FHS members
- Increase funding for student activities to enhance interactive environment
- Review courses, including the core courses, based upon students' feedback
- Increase the base budget of the program
- Other recommendations are outlined in the table 1

Summary of the Reviewers' Recommendations with the Department's and Dean's Responses

Recommendation	Proposed Follow-Up	Responsibility for Leading Follow-Up	Timeline for Addressing Recommendation
Review the content and format of the core courses with consideration of the feedback received from the students.	The program will meet with the instructors of these two courses to discuss the findings from the student survey and come up with changes to the delivery and content. They will continue to survey students on a periodic basis – once every 3 years - for continuous improvement	Co-Directors of BME	Meeting with the instructors in the fall to identify opportunities to improve the course offerings and format for implementation in 2022

Continue to explore opportunities to encourage additional Health Sciences faculty to contribute to the BME program.	The program agrees with this recommendation. Over the past year they have had renewed interest from Health Sciences faculty members to join the school. They have formalized the approval process for Associate Members with a clear expectation of their involvement and participation in supervision, co- supervision and in teaching activities. They will continue to engage with institutes and centers in Health Sciences to enhance research collaborations which will facilitate increased participation.	Co-Directors of BME	Ongoing over the next six years, until the next IQAP review
Consider adding a requirement, at least at the PhD level, that supervisory committees include members from both Engineering and Health Sciences.	<p>Currently, all supervisory committees are interdisciplinary. That is, they consist of faculty members from two or more different disciplines – either within Engineering or from the faculties of Sciences and Health Sciences.</p> <p>They are in the process of identifying opportunities for increasing participation from Health Sciences members of the school.</p> <p>The first step is to increase the number of Associate Members from Health Sciences through outreach to them. This will increase the diversity of the expertise present and enable identification of suitable members with the right expertise for</p>	Co-Directors of BME	Gradual implementation over the next three years

	<p>a supervisory committee.</p> <p>The next step will be to ensure that the committees for students whose research has a health sciences component have a suitable member. This will be done at the time of approval of the committee through gentle encouragement and suggestion.</p> <p>They believe that some of the research within the school requires expertise that is present outside the faculty of Health Sciences and therefore think that a case-by-case assessment rather than a requirement would be more suitable.</p>		
<p>Address sources of mismatch between students' expertise and TA assignments, including inviting students to self-identify mismatched assignments, helping students seek TA opportunities outside the Faculty of Engineering, and, if possible, increasing the number of TA opportunities within the iBME program.</p>	<p>They are aware of the issue identified with a few students. Currently, the students are given the opportunity to choose departments in which they would like to TA, and 80% of our students get either their 1st or 2nd choice.</p> <p>They believe that students with Health Sciences backgrounds may not be able to get the department of their 1st choice as the Faculty of Health</p>	BME Admin Staff	<p>Revisit each year and reassess</p>

	<p>Sciences has a considerable number of their own TA's and as such do not have sufficient opportunities for BME students.</p> <p>However, not only do the majority of BME students receive TA assignments in their department of choice, but most departments also do everything possible to accommodate our students' preference of courses.</p>		
Consider increasing the very modest budget available to the co-directors to support events which include the annual symposium.	They agree with this recommendation and will schedule a discussion with the Deans and Associate Deans on programming and support that they envision for our students over the next 3 years, and seek additional support for those initiatives which will enhance collaborative, communication and outreach activities.	Co-Directors of BME	<p>Discuss with Deans in summer of 2021 and fall of 2021.</p> <p>Implement events and activities in 2022</p>
Explore options to equalize the cost-to-supervisor between FHS and Engineering as a means to reduce the barrier to FHS participation.	<p>The cost to supervisor is determined largely by the respective faculties. It requires discussion between the two Associate Dean's.</p> <p>They think that the school offers students with a unique skill set and interests that are</p>	Associate Deans	N/A

	not available in the various departments in Engineering or Health Sciences. Therefore, cost parity should not be an issue as the skill set of students in SBME is different from those in FHS and may be well suited to technology relevant projects.		
The co-directors might consider a regular meeting with the Associate Deans at least twice per year to review progress and help program growth. These meetings might include the leaders of each of the 3 research themes.	They agree with this recommendation and were already discussing implementing these regular meetings and will do so in the coming academic year	Co-Directors of BME	Fall 2021
A fundraising and development strategy would be helpful to clarify the expected roles and responsibilities of BME and the two Deans' offices.	This is within the purview of the Dean's office	Deans of Engineering and Health Sciences	N/A
There might be a disproportionate benefit from a small investment to increase the frequency of the very popular student events.	The program agrees with this recommendation, and they will increase the social activities budget available to BMEGA (student association) from \$1500 to \$5000 to carry out more activities over the year.	Co-Directors of BME	Fall 2021

Faculty Response

As an interdisciplinary program associated with the Faculties of Engineering and Health Sciences, the response below was crafted and mutually agreed upon by both Faculties.

The reviewers have provided a very complementary report on the graduate program in the School of Biomedical Engineering, highlighting excellence in student engagement and a strong focus on research. The program has built up a substantive list of course topics and regularly oversees several unique and excellent initiatives, like its symposium and newsletter, that significantly foster skills development beyond scientific exploration in its students. The intersection of two strong Faculties in the School gives its students unique access to expertise from two dissimilar but complementary fields. They are confident that the program will respond constructively to the recommendations.

The reviewers raise questions about the extent of involvement of Health Sciences faculty. The Faculties remain steadfast in our commitment to exposing students to both fields throughout their studies. They support the reviewers' suggestion that students should have at least one member of both Faculties on their supervisory committees. They agree with the program's response that the first consideration should be appropriate expertise, but encourage them to consider the requirement for a clear justification when forming committees that do not reflect this criterion, and also to monitor and evaluate the committee composition over time. Although they support the program's suggestion to encourage cross-faculty involvement through engagement with research centres and institutes, they would like to see more balanced student recruitment from the two Faculties in the future, with a possible review of whether elements of the program could be adjusted to help.

The reviewer's report deviates significantly from the intended scope of an IQAP review and delves into matters of employments, finance and even hiring recommendations, which the Faculties feel are beyond its purview to improve the academic mission of the program. They recognize the guidance of the School of Graduate Studies in this matter and will overlook the majority of these issues from the report but must address some that have been brought up in the program's response. Most notably, the Faculty of Engineering has reviewed the budget of the program and finds that its funding compares favourably to other programs of its size in Engineering.

While specific proposals for funded initiatives related to events, student stipends, and TA hiring have varying degrees of merit, all program costs must be resourced from program revenues. In the same vein, fund-raising initiatives must arise from the enthusiasm, initiative, and activity of the program leaders and participating faculty, with institutional support where this activity aligns closely with the Faculties' fund-raising priorities.

In relation to funding, governance and collaborative connections, the Faculties again encourage the School to re-establish the industrial advisory board mentioned in the terms of reference for the School to better connect its associated research work with interested funding partners; and follow through with the directors' plan to pursue larger strategic research initiatives (ORF-RE, CREATE, etc) that would involve a substantial number of its associated faculty.

The Faculties were uncertain about the meaning of reviewer's comments about the cost difference for supervisors between Faculties. A student in the program receives the same remuneration whether their supervisor is from Engineering or Health Science, and the Dean of Engineering provides a bursary to those students, in addition to funding from the School of Graduate Studies. In Health

Sciences, any additional support provided to individual faculty members is a department matter. They also understand that the amount of financial support to BME students is comparable to other programs in Engineering and Health Sciences with similar research missions.

Finally, two points of clarification. Some sections of the program's implementation plan have been erroneously assigned to the Deans/Associate Deans. The responsibilities for these goals remain with the program, though the Faculties remain committed to providing support and assistance as they endeavor to make these improvements. Finally, although students are encouraged to publish their research during their graduate training, there is actually no program requirement for them to do so, despite any allusion to this point in the report.

Quality Assurance Committee Recommendation

McMaster's Quality Assurance Committee (QAC) reviewed the above documentation and the committee recommends that the program should follow the regular course of action with a progress report and subsequent full external cyclical review to be conducted no later than 8 years after the start of the last review.

FINAL ASSESSMENT REPORT

Institutional Quality Assurance Program (IQAP) Review

Electrical and Computer Engineering Graduate Programs

Date of Review: April 14th -16th

In accordance with the University Institutional Quality Assurance Process (IQAP), this final assessment report provides a synthesis of the external evaluation and the internal response and assessments of the graduate programs delivered by Electrical and Computer Engineering. This report identifies the significant strengths of the program, together with opportunities for program improvement and enhancement, and it sets out and prioritizes the recommendations that have been selected for implementation.

The report includes an Implementation Plan that identifies who will be responsible for approving the recommendations set out in the Final Assessment Report; who will be responsible for providing any resources entailed by those recommendations; any changes in organization, policy or governance that will be necessary to meet the recommendations and who will be responsible for acting on those recommendations; and timelines for acting on and monitoring the implementation of those recommendations.

Executive Summary of the Review

In accordance with the Institutional Quality Assurance Process (IQAP), the Electrical and Computer Engineering program submitted a self-study in April 2021 to the Vice-Provost and Dean of Graduate Studies to initiate the cyclical program review of its graduate programs. The approved self-study presented program descriptions, learning outcomes, and analyses of data provided by the Office of Institutional Research and Analysis. Appendices to the self-study contained all course outlines associated with the program and the CVs for each full-time member in the department.

Two arm's length external reviewers and one internal reviewer were endorsed by the Dean, Faculty of Engineering, and selected by the Vice-Provost and Dean of Graduate Studies. The review team reviewed the self-study documentation and then conducted a remote review on April 14th – 16th, 2021. The review included interviews with the Provost and Vice-President (Academic); Vice-Provost and Dean of Graduate Studies, Associate Dean, Graduate Studies and Research, Chair of the department and meetings with groups of current students, full-time faculty and support staff.

The Chair of the Department and the Dean of the Faculty of Engineering submitted responses to the Reviewers' Report (May 2021). Specific recommendations were discussed and clarifications and corrections were presented. Follow-up actions and timelines were included.

- **Strengths**

- **The Student Experience:** Graduate students express a high level of satisfaction with respect to their programs. The percentage of international ECE graduate students is one of the highest among all graduate programs offered at McMaster. Equity, diversity, and

inclusion seem to be important priorities for the ECE department, which is of clear benefit to international graduate students.

- **Community Engagement:** The cooperative education program provides experiential learning opportunities for graduate students as part of their degree. This is an essential complement to their academic and research training, and provides them with critical skills to succeed in industrial careers.
- **Research:** The ECE Department offers an outstanding research training environment and many opportunities for collaborative projects.

- **Areas for Enhancement or Improvement**

- **Program Governance:** It would be beneficial to enhance departmental processes to review and evolve graduate course offerings.
- **Communication:** There seemed to be a lack of common understanding among faculty about certain aspects of the graduate program (e.g. faculty mentorship, grading practises). Enhancing the level of discussions relating to the graduate program would be beneficial.
- **Student Interactions:** Enhancing the degree to which graduate students have the opportunity to interact with each other, outside of their immediate lab groups, would be beneficial.

Summary of the Reviewers' Recommendations with the Department's and Dean's Responses

Recommendation	Proposed Follow-Up	Responsibility for Leading Follow-Up	Timeline for Addressing Recommendation
Recommendations highlighted in review report's Executive Summary			
Consider whether there would be a benefit in normalizing the minimum grade admission requirement for all programs to B+.	We agree that the admission requirement for the MEng in Electrical & Biomedical Engineering (currently a B minimum) could be adjusted to match the current minimum for the other programs (B+). We will put this change through the official approval process in the coming academic year, so it will come into effect in Sept 2022, if approved.	Assoc Chair	Sept 2022

Monitor the impact of the tuition differential between international PhD and international MASc students.	We agree that it will be important to track the impact of the tuition differential on our MASc enrollment and to make sure that we can maintain a high-quality Masters program. Current enrollment patterns are being impacted greatly by COVID restrictions across the world, so we will need to monitor the effects of the tuition differential over the next few years as things hopefully normalize.	Chair, Assoc Chair, Administrator	Initial review before 18-month progress report; Analyze again in May 2024
Communicate to faculty the departmental process to review and coordinate yearly graduate course offerings.	We agree with the reviewers that our graduate programs could benefit from greater coordination amongst instructors. Given the breadth of subdisciplines within ECE, we have been working on forming Graduate Teaching Clusters to facilitate such discussions, as described in the IQAP self-study document. This model has worked very well for the ongoing assessment and continuous improvement of our undergraduate programs, and the department as a whole has agreed to implement teaching clusters also at the graduate level. Cluster chairs were assigned for the 2020-21 academic year, but in light of the continuation of the pandemic, the deadline for their initial meetings was extended until the summer of 2021.	Chair, Assoc Chair, Graduate Teaching Cluster leaders	Dec 2021

Enhance the curriculum so that there is a better balance between theoretical and applied content, between physics-based modelling and data-driven paradigms. In particular, there is a clear need for more machine learning courses taught from an application-centric viewpoint.	Overall discussions about curriculum improvements will best take place in our Graduate Teaching Clusters, so that they can be customized to the difference subdisciplines of ECE within our department. In regards to machine learning courses, Dr. Sorina Dumitrescu introduced a new 4 th -year undergraduate elective in Machine Learning this past year, and she is now developing a graduate-level course that will be offered first as a Special Topics course in Winter 2022. We anticipate the development of further courses on data-driven approaches as we continue to hire faculty in the computer engineering area.	Chair, Assoc Chair, Graduate Teaching Cluster leaders	Winter 2022
Consider implementing a minimum number of students necessary to hold a graduate class.	The distribution of enrollments in our courses has been a topic of discussion at department gatherings over the last year, with a number of well-thought out mechanisms being proposed. However, the finalization of a policy was put on hold during the pandemic. We will discuss this at our department retreat this summer, with a proposal to be developed in the next academic year based on discussion at department meetings.	Chair, Assoc Chair	Fall 2022
Provide more opportunities and reasons for MEng students to engage with course instructors and peers.	We will look at developing a series of meetings each academic year for MEng students, to promote cohesion among this cohort. We will also work on integrating MEng students more fully into existing social events, department seminars, etc.	Chair, Assoc Chair	Fall 2022

Facilitate the creation of a graduate student social club.	We agree that an ECE grad student club could greatly benefit our students, particularly as they look to re-engage with each other after pandemic restrictions are lifted. We will look at developing an election process and budget that can encourage formation of this club, while maintaining some oversight by the department, to ensure that it works to meet the needs of all our graduate students. We do not want the activities of this department-level club to conflict with the existing faculty-level Engineering Graduate Society (EGS), so we will make sure that it is created in consultation with the EGS leadership.	Chair, Assoc Chair, Administrator	Winter 2022
Ensure that ECE faculty members have a clear understanding of departmental policies and best practises relating to junior faculty mentorship.	The Chair will continue our practice of annual (or more often) one-on-one meetings with faculty members on tenure track and the early stages of a tenured career. These meetings offer the opportunity to review the faculty member's research and teaching portfolios and to provide constructive, personalized advice on the balance of each. The Chair will also inform the department at large over this process to ensure that there is a clear understanding of the expectations amongst all junior faculty and their mentors.	Chair	Dec 2021
Additional recommendations in specific review report sections			

Provide enhanced course outlines that will allow students to get a better understanding about the content and learning outcomes of the courses.	We have recognized that there was a fair degree of inconsistency in the level of detail provided in graduate course outlines, so in Summer 2020 we started having the grad course instructors move to a more detailed, and standardized, course outline template. The template is based on that of our undergrad course outlines. With the help of the department admin staff, we have almost completed the updating of all grad course outlines to match the new template and will make these available to the students for the coming academic year.	Assoc Chair, Administrator, Grad Admin	July 2021
Provide alternatives to 3MT presentations in ECE 790.	Overall, we have found the 3MT format for ECE 790 to be very positive and have been very impressed with the communication skills and confidence gained by our graduate students. However, we recognize that some	Chair, Assoc Chair, MacPherson Institute	Winter 2022

	<p>hesitancy about this format by a small number of students was raised in our anonymous student survey and in the meetings with the IQAP reviewers. It is not clear whether this hesitancy is being expressed by students who have completed ECE 790 and did not find it to be a completely positive experience, or if students who have not yet taken ECE 790 are anxious about the experience. Therefore, we propose to carry out a structured review out this course, led by the MacPherson Institute, incorporating surveys of students before, during and after taking ECE 790, as well as focus-group discussions with a subset of students in the course. Initial planning meetings for this structured review have already taken place.</p> <p>We will also conduct an anonymous survey of the faculty in ECE to gain a better understanding of the supervisors' views on how ECE 790 is functioning to help their students improve their communication skills and confidence.</p>		
Consider offering more project-based graduate courses.	<p>We recognize that there is a broad spectrum of research styles among research groups within the program, and that project-based courses may be appropriate ways for some students to prepare for their research programs. We will ask the cluster leaders to make this suggestion one of the top topics for discussion at the Graduate Cluster meetings this year. The availability of "Special Topics" courses would enable a pilot</p>	Chair, Assoc Chair, Graduate Teaching Cluster leaders	Winter 2023

	study to be conducted reasonably quickly if a cluster wishes to do so.		
Consider encouraging teamwork in graduate courses (via projects).	We recognize that we have only a few graduate courses so far that incorporate a large component of group work, and we agree that this is something that could be explored further. We will have initial discussion at graduate teaching cluster meetings and then follow up with a workshop by the MacPherson institute on best practices for forming groups, encouraging healthy group dynamics, and assessing individual contributions to group projects. The availability of "Special Topics" courses would enable a pilot study to be conducted reasonably quickly if a cluster wishes to do so. If a pilot does go ahead, we will ensure that the instructor receives the appropriate training on the formation and management of groups to ensure that our process is consistent with the Faculty's and University's goals of equity, diversity and inclusion.	Chair, Assoc Chair, Graduate Teaching Cluster leaders	Fall 2022
Consider offering graduate courses focused on recent academic papers, that would reflect the state of the art in their field.	We have had some discussions previously about the possibility of developing an Independent Study graduate course in ECE but no consensus was reached. We will make this a major discussion point for our department retreat this Summer, and then the Graduate Affairs Committee will develop a proposal to bring to a department meeting in the coming academic year.	Chair, Assoc Chair	Fall 2021
Consider integrating student feedback into	We will ask the cluster leaders to incorporate into every meeting of their Graduate	Chair, Assoc Chair, Graduate Teaching Cluster leaders	Summer 2022

a loop for course improvement	Teaching Cluster a discussion of how instructors are working to incorporate feedback from students into course improvements. We will also suggest that instructors consider making use of the MacPherson Institute's mid-course review process, rather than relying solely on the end-of-term course evaluations. The Chair and Assoc Chair will also organize an annual stakeholders' meeting with graduating students from our graduate programs, to create another pathway for feedback on our programs and courses. Such stakeholder meetings for our undergraduate programs have provided insightful feedback.		
Consider a succession plan for the Graduate Administrative Assistant Cheryl Gies. While her dedication and enthusiasm are impressive, it might be hard to find a new graduate assistant with the willingness to take on her heavy workload when Cheryl retires. It might be a good idea to plan for hiring one Graduate Administrative Assistant for MASc and PhD Programs, and a second one for the MEng Program.	Our Accounting & Academic Administrative Assistant, Ms. Tracey Coop, has been assisting Ms. Gies over the past few years in managing external graduate scholarship nominations in the department, in overseeing facility access for our graduate students, and in moving our graduate course outlines to a new template. In that way, she will be well situated to be able to take on more graduate program administration tasks if required at some point in time. Of course, we will hold an open application process for Cheryl's position when she retires. We will also discuss the overall staffing needs for our graduate programs with the Dean's office.	Chair, Administrator,	Fall 2021
The Department could provide more	Our department found it difficult to maintain and update our previous centralized HPC	Chair, Assoc Chair, IT staff	Winter 2022

centralized computing.	system, so we have suggested that our students use resources provided by Compute Canada and other HPC-specific entities. We will look to enhance local services that provide access to Compute Canada, for example by promoting the annual seminar on these facilities hosted by RHPCS/SHARCNET. We will also conduct a survey of ECE graduate students and faculty to find out their software needs. From the survey results we will determine where software licensing and/or support can be centralized at the department or university level.		
It is not recommended to achieve an enhanced use of physical resources by combining on-line and in-person graduate student activities after the pandemic. This might lead to a decrease in the community spirit of the graduate students belonging to the same lab. In-person activities should be encouraged as much as possible after the pandemic.	We agree that this is important. We plan to take a graduated approach to transitioning back to in-person activities in alignment with the Faculty of Engineering Return to Work Taskforce' policies currently being developed. In the short term, we will need to balance cohesion among graduate students with access by student unable to return immediately to campus. But after pandemic restrictions are lifted, we will promote a full return to in-person activities, and will ensure that physical resources are allocated in ways that will only enrich the spirit of our graduate student community.	Chair, Assoc Chair	Fall 2022

Faculty Response

The reviewers in their assessment of the Department of Electrical and Computer Engineering have provided a report that is very similar to a previous IQAP review, denoting a strong program with global recognition of its research, a collaborative and collegial faculty and staff, high satisfaction by the students with the curricula and climate, and excellent focus on experiential learning and skills development. From the recommendations offered in the report, the Faculty can see that the department has identified areas for improvement in their curricula and enhancements to the student experience.

The attention on types of courses, class sizes, course outlines and coordinated course offerings is welcomed and the Faculty will endeavour to assist the department in approving these changes, as required, through the different committees of the university. A student club to arrange social activities is always appreciated since they can be very effective in bringing new and senior students together in a friendly and enjoyable manner, though the Faculty will want to see this club working under the EGS, not set up to be in competition. The approach of the department to the suggestion of giving alternatives to their 3MT-style communications exercise seems appropriately tempered. Due to the benefits of this exercise and appropriateness in preparing students for a skill that will demand lifelong improvement, the concerns of the few students should be considered but formulating alternatives seem undesirable, especially in light of the fact that it could mean an uneven evaluation standard being applied throughout a cohort.

There are some recommendations, however, that the Faculty feels the reviewers exceeded their mandate. The Faculty does not consider there to be any issue with the tuition differential between domestic and international Masters students and does not intend to contribute to this item listed by the department. In regards to staffing, the department is adequately covered and may need to re-organize the roles and responsibilities of its people, but these on-going organizational issues seem beyond the scope of this review since they have not been shown to affect the learning experience. Similarly, the given recommendation, which seems to be against blended learning, is far too prescriptive for the review and does not align with the views of the Faculty. The Faculty seeks to capitalize upon the resources that were developed through the pandemic, not retreat back to the previous norm, so long as the student experience is better for this change.

Quality Assurance Committee Recommendation

McMaster's Quality Assurance Committee (QAC) reviewed the above documentation and the committee recommends that the program should follow the regular course of action with a progress report and subsequent full external cyclical review to be conducted no later than 8 years after the start of the last review.

FINAL ASSESSMENT REPORT

Institutional Quality Assurance Program (IQAP) Review

Engineering Physics Graduate Programs (M.A.Sc, M.Eng., Ph.D.)

Date of Review: April 29th and 30th

In accordance with the University Institutional Quality Assurance Process (IQAP), this final assessment report provides a synthesis of the external evaluation and the internal response and assessments of the graduate programs delivered by Engineering Physics. This report identifies the significant strengths of the program, together with opportunities for program improvement and enhancement, and it sets out and prioritizes the recommendations that have been selected for implementation.

The report includes an Implementation Plan that identifies who will be responsible for approving the recommendations set out in the Final Assessment Report; who will be responsible for providing any resources entailed by those recommendations; any changes in organization, policy or governance that will be necessary to meet the recommendations and who will be responsible for acting on those recommendations; and timelines for acting on and monitoring the implementation of those recommendations.

Executive Summary of the Review

In accordance with the Institutional Quality Assurance Process (IQAP), the Engineering Physics program submitted a self-study in March 2021 to the Vice-Provost and Dean of Graduate Studies to initiate the cyclical program review of its graduate programs. The approved self-study presented program descriptions, learning outcomes, and analyses of data provided by the Office of Institutional Research and Analysis. Appendices to the self-study contained all course outlines associated with the program and the CVs for each full-time member in the department.

Two arm's length external reviewers and one internal reviewer were endorsed by the Dean, Faculty of Engineering, and selected by the Vice-Provost and Dean of Graduate Studies. The review team reviewed the self-study documentation and then conducted a remote review on April 29th and 30th, 2021. The review included interviews with the Provost and Vice-President (Academic); Vice-Provost and Dean of Graduate Studies, Associate Dean, Graduate Studies and Research, chair of the department and meetings with groups of current students, full-time faculty and support staff.

The Chair of the Department and the Dean of the Faculty of Engineering submitted responses to the Reviewers' Report (May 2021). Specific recommendations were discussed and clarifications and corrections were presented. Follow-up actions and timelines were included.

- **Strengths**
 - Quality of Research
 - Research Infrastructure
- **Areas for Improvement**
 - Graduate course availability
 - Inclusion
 - Student experience
 - Student recruitment
 - Graduate student financial support
 - MEng program

Summary of the Reviewers' Recommendations with the Department's and Dean's Responses

Recommendation	Proposed Follow-Up	Responsibility for Leading Follow-Up	Timeline for Addressing Recommendation
Graduate course availability: A list of "primary" courses would help build up a more structured ordering of courses that are consistently offered year-to-year so that graduate students know what courses are expected to be offered throughout their program. A cross-linking of courses with an ENG PHYS designation to courses in other departments may also help make the selection of courses in EngPhys more appealing to students. Clear messaging and active encouragement for graduate students to take cross-listed and out of department courses will help alleviate student concerns about limited department course offerings.	The department will review our graduate course offerings in the following 4 directions: a) increasing the course requirements which will increase the demand for courses, making it possible to make more available, b) adding new courses to meet needs where possible, c) cross-listing courses from other departments and d) planning primary course offerings to be offered on a regular schedule. The improved course offerings will be communicated to our students through various media.	Department/Department Chair	Update at 18-month follow-up report
Inclusion: It is recommended that recruitment processes for both graduate students	As part of the development of a graduate student recruitment strategy, the	Department/Department Chair	Update at 18-month follow-up report

and new faculty be implemented for inclusion and attraction of female and diverse candidates.	department will prioritize the diversification of our graduate student cohort.		
Student experience: Better communication should be sought with on-line instruction and research supervisors. Equipment training and maintenance should be recognized to make sure new students are able to effectively start their experimental research. Some graduate students (especially, the female students) suggested they would further benefit from a department seminar course where alumni and/or other prominent external speakers (including female speakers) were brought in for talks regularly. A teaching assistant training module may help students carry out their teaching duties with more confidence and skill.	The department will encourage faculty to stay in closer contact with students during the pandemic and also take extra steps to ensure research facilities are available to students, so that delays are not incurred. We will review the structure of the Seminar Course and also revitalize the Department Seminar Series, which lapsed during the pandemic. There is a three-hour training program offered to TAs by the Department at the beginning of each term which will be reviewed and revised, especially in light of virtual teaching, to help the TAs become more engaged participants in the undergraduate student experience.	Department/Department Chair	Update at 18-month follow-up report
Student recruitment: It is recommended that recruitment processes for undergrad students from EngPhys (or equivalent) programs at other universities in Canada be developed.	In the 2013 IQAP review <i>"it was noted that the department does not seem to have a coherent graduate student recruitment strategy"</i> . This remains the case, in part due to the decentralized nature of the recruitment process. The department will explore ways in which we can work more effectively as a group to meet common recruitment needs, while preserving faculty autonomy.	Department/Department Chair	Update at 18-month follow-up report

Graduate student financial support: It is recommended that more active messaging be employed regarding graduate student financial support to dispel any student concerns (about pay variances).	The department will communicate more clearly the newly established graduate pay levels, for visa/domestic MASc/PhD students. They have already introduced a new process whereby students that transfer from the Master's to PhD program receive a written statement of their funding for the duration of the program.	Department/Department Chair	Update at 18-month follow-up report
MEng program: It is recommended to evaluate the program enrollment and student satisfaction after collecting a few years of data.	The MEng program in its present form is quite new and will take several years to develop in the way we anticipate. By the next IQAP review the department will have sufficient data to establish whether the program is successful and if it should be continued, revised, or closed.	Department/Department Chair	Update at 18-month follow-up report

Faculty Response

The Faculty is very pleased with the reviewers' comments in the recent IQAP review of graduate programs in the Department of Engineering Physics. The review highlights a department that is well positioned on the international stage in several key areas of research related to energy and electronics and makes note of the outstanding infrastructure in the department to aid their graduate students in the very influential contributions. Students appear to be happy with the programs, faculty and resources which the department provides for timely degree completion.

A series of recommendations were offered in the report to improve the graduate programs of the department, to which the Dean's office will provide support. They note and applaud the reviewers' comments related to equity and inclusion. The department's intent to develop an improved recruitment strategy should benefit from the redesigned applications system being prepared by SGS. Efforts at the department, Faculty and university level will continue to shape our graduate community to better reflect the public we serve. The Faculty will also continue to help the department in tuning the curricula and learning outcomes of their MEng program (as well as all programs) as well as ultimately assessing its viability as more data is collected.

Some of the reviewers' recommendations are a bit short sighted though since dwelling on pandemic times for research progress does not seem helpful unless there are concerns connected to similar behaviours occurring during times of normal operation. They want to also highlight what seems to have been missed by the reviewers that the Faculty already invests heavily in TA training with 5 hours of paid experiential training that they offer (but not been required to do) to help prepare students for their teaching assignments. More training ahead of starting one's assignment does not seem warranted though more meetings with course instructors may help alleviate the stress of expectations on these TAs.

The Faculty's goals and initiatives are closely aligned to the department and they will continue to assist in its success.

Quality Assurance Committee Recommendation

McMaster's Quality Assurance Committee (QAC) reviewed the above documentation and the committee recommends that the program should follow the regular course of action with a progress report and subsequent full external cyclical review to be conducted no later than 8 years after the start of the last review.

FINAL ASSESSMENT REPORT

Institutional Quality Assurance Program (IQAP) Review

Chemistry and Chemical Biology Graduate Programs

Date of Review: April 27th and 28th 2021

In accordance with the University Institutional Quality Assurance Process (IQAP), this final assessment report provides a synthesis of the external evaluation and the internal response and assessments of the graduate programs delivered by Chemistry and Chemical Biology. This report identifies the significant strengths of the program, together with opportunities for program improvement and enhancement, and it sets out and prioritizes the recommendations that have been selected for implementation.

The report includes an Implementation Plan that identifies who will be responsible for approving the recommendations set out in the Final Assessment Report; who will be responsible for providing any resources entailed by those recommendations; any changes in organization, policy or governance that will be necessary to meet the recommendations and who will be responsible for acting on those recommendations; and timelines for acting on and monitoring the implementation of those recommendations.

Executive Summary of the Review

In accordance with the Institutional Quality Assurance Process (IQAP), the Chemistry and Chemical Biology programs submitted two self-studies in March 2021 to the Vice-Provost and Dean of Graduate Studies to initiate the cyclical program review of its graduate programs. The approved self-studies presented program descriptions, learning outcomes, and analyses of data provided by the Office of Institutional Research and Analysis. Appendices to the self-study contained all course outlines associated with the program and the CVs for each full-time member in the department.

Three arm's length external reviewers and one internal reviewer were endorsed by the Dean, Faculty of Science, and selected by the Vice-Provost and Dean of Graduate Studies. The review team reviewed the self-study documentation and then conducted a virtual review on April 27th and 28th, 2021. The review included interviews with the Provost and Vice-President (Academic); Vice-Provost and Dean of Graduate Studies, Associate Deans, Grad Studies and Research, Chair of the department and meetings with groups of current students, full-time faculty and support staff.

The Chair of the department and the Dean of the Faculties of Science and Health Science submitted responses to the Reviewers' Report (September and October 2021 respectively). Specific recommendations were discussed and clarifications and corrections were presented. Follow-up actions and timelines were included.

Strengths

1. Internationally recognized faculty members and research programs.
2. Outstanding leadership within the Department and the Faculty.
3. World class facilities and instrumentation.
4. Affiliation with Centre for Probe Development and Commercialization (CPDC), Biointerfaces Institute, Institute for Infectious Diseases Research, Brockhouse Institute for Materials Research (BIMR), & the McMaster Nuclear Reactor

Areas for Improvement

1. Clear definition of the expectations of the programs
2. Introduction of modular short courses to provide hands-on interdisciplinary training options
3. Introduction of training programs associated with the research institutes
4. Increased EDI training for faculty, staff and students
5. Increased professional development and career planning
6. Strategic plan for sustainability versus growth
7. Review comprehensive exam expectations
8. Expanded graduate student representation

Please outline the recommendations made by reviewers and indicate how you plan to address the recommendations in the chart below.

Recommendation	Proposed Follow-Up	Responsibility for Leading Follow-Up	Timeline for Addressing Recommendation
1. Clear definition of the expectations of the programs. Each program should define and communicate their mission for the recruitment of new students and ensure that all admitted and incoming students are aware of the requirements and expectations of the degree program they have selected.	As suggested, we have updated our website to reflect the proposed definition of chemical biology as “the application of chemical principles to Biochemistry & the Medical Sciences. Examples might include therapeutics, drug delivery systems, medicinal chemistry, or structural biology, where in all cases the use of chemistry is central.” In the meantime, we will also continue to emphasize the Chemistry vs. Chemical Biology differentials in terms of TA, course load and exam milestone expectations during our joint graduate program presentations to prospective students, such as the annual Graduate Information Session (GIS). We	P. Kruse and G. Melacini will continue to work collaboratively on broad information campaign aimed at reaching all members of our graduate communities. We will accurately inform students during the annual GIS and P. Kruse and G. Melacini will discuss this topic with colleagues at departmental meetings, graduate newsletters and workshops.	Underway. A new website for Chemical Biology has been completed, and the administrative assistants of the two programs will undergo training to keep both websites updated as living documents both for recruitment and as a resource for the current students. The information campaign is an ongoing effort starting from the Fall 2021.

	<p>will also encourage our colleagues in both programs to ensure that graduate applicants are aware of such differences before finalizing their choices. We agree that it is in everybody's best interest to ensure that students make an informed decision and enroll in the program that best fits their needs and aspirations. However, we also recognize that chemical biology graduate students cost more to supervisors due to the lower TA load and this may also be a factor in the selection of one graduate program vs. another.</p>		
<p>2. Introduction of modular short courses to provide hands-on interdisciplinary training options. DCCB should review the role of formal graduate courses in graduate student training with the goal of improving efficiency and consistency. Training requirements for each program should be identified (i.e. foundation science, experimental techniques, communication, EDI, etc.) and the mode of delivery selected as appropriate.</p>	<p>We fully understand that shorter but more frequent courses will serve some of our students better, especially the M.Sc. cohort whose graduate tenure is typically limited to only two years and is denser in formal class requirements. Currently, most graduate modules (worth 1.5 units each) are offered only every other year. To address this limitation, we will initiate discussions at departmental meetings and graduate workshops about allowing more flexibility in the scheduling of our graduate modules to better meet the demands of our student population. We will also capitalize on graduate courses offered by other departments and neighboring universities. A process is already in place for visiting graduate students within Ontario without the need of formal admission in other graduate programs or of additional fee payment. Further</p>	<p>P. Kruse and G. Melacini will initiate discussions with colleagues about enhancing the scheduling flexibility of our graduate offerings and planning hands-on workshops. Such discussion will not be limited to McMaster, but we will also contact our counterparts at neighbouring institutions to identify synergies at the level of graduate offerings.</p>	<p>Our graduate teaching schedule is already set until Fall 2022. In addition, this is a substantial change that requires ample buy-in from colleagues and pre-planning with stepwise implementation. So, we do not expect to be able to implement such changes before Fall 2023.</p>

	<p>details about the Ontario Visiting Graduate Student (OVGS) application are available here. To facilitate this process, we will add examples of such courses that have been taken by our students on Grad FAQ page. In addition, we plan to complement our existing graduate module portfolio in CCB with hands-on instrumentation/technique-based workshops for which students will earn micro-credits. In line with these efforts, we will also capitalize on micro-credentials that are being coordinated centrally by the Faculty of Science and the MacPherson institute (see point 5).</p> <p>As to the CB700 milestone, most of the feedback provided by students pertains to a previous edition of this course, as the students who attended the IQAP meeting are all senior and did not have an opportunity to attend the recently revamped version of CB700. The new CB700 now includes two modules: 700A, joint with Chemistry, and focusing on communication and EDI, and 700B, focusing on foundation science and experimental techniques. Both 700A and 700B are offered every year.</p>		
<p>3. Introduction of training programs associated with the research institutes. The self-study from the Chemical Biology graduate program defines 3 key</p>	<p>We concur about the importance of capitalizing on synergies with McMaster institutes. Several PIs in the Chemical Biology graduate program are affiliated with institutes, such as the Institute of Infectious Diseases (IIDR) and</p>	<p>P. Kruse and G. Melacini will approach the directors of CPDC and BI to discuss options for themed symposia. Brainstorming</p>	<p>Summer 2022</p>

<p>institutes that align with the research interests of faculty: i) The Michael DeGroote Institute for Infectious Disease Research (IIDR), ii) Centre for Probe Development and Commercialization (CPDC), and iii) Biointerfaces Institute (BI). These institutes provide an enormous opportunity to PIs and students from the perspective of advanced research facilities and technical expertise. We propose that these key research institutes could be leveraged to enhance research output and opportunities for both the Chemistry and the Chemical Biology Programs by establishing an affiliated Training Program. To borrow from a new evolving policy at the University of Toronto, Research Institutes which fulfill the strategic priorities of the University are provided with additional seed funding on a competitive basis. This seed funding is</p>	<p>the McMaster Institute for Research on Aging (MIRA), that already organize themed symposia and scholarships. The Faculty of Health Sciences (FHS) also organizes an annual FHS plenary that chemical biology graduate students typically attend. We agree that extending similar initiatives to the CPDC, BI and FoS will further enhance our trainee experience. All institutes provide instrumentation training to our trainees on a fee-basis.</p>	<p>about a FoS plenary has already started as part of the mentorship initiative.</p>	
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used to provide themed symposia, poster sessions, student presentations, and workshops, which would be available to students across a wide range of programs who make use of the research institutes.			
4. Increased EDI training for faculty, staff and students. The goal would be to create modules that might encompass ~10-hour exercises and case studies, to be offered annually. These modules could then evolve into more formalized exercises as the upper administration implements EDI training.	As discussed in the recommendation 2 proposed follow up on the introduction of short modular courses, EDI is now a central component of the joint CCB introductory 700 graduate course required for all new graduate trainees. In this graduate module, EDI is approached both conceptually and through case studies with the support of McMaster Equity & Inclusion Office (EIO) staff. In addition, the CCB in conjunction with the FoS Dean's office is leading several initiatives aimed at stimulating discussions on EDI among faculty, staff and students.	The CCB EDI & Conversation Committee	Ongoing in collaboration with the EIO staff and departmental committees.
5. Increased professional development and career planning. That the program leadership consider incorporating a discussion of career planning during the annual doctoral committee meetings. The student could be asked to identify	We fully agree about the importance to build a personalize career plan over the course of the graduate career to facilitate the transition to employment post-graduation, especially considering that the majority of our trainees may not secure permanent positions in academia. We will ensure that discussions about future career directions start early and become an integral part of	In departmental meetings and graduate newsletters, P. Kruse and G. Melacini will bring to the attention of our colleagues the need to initiate career planning discussions during committee meetings. They will	We plan to have the changes pertaining to the supervisory committee meetings and seminar speakers implemented by the Fall 2022, so we can present and discuss them with our colleagues. In addition, we will coordinate with the

<p>career interest (academic, industry or otherwise) and the committee could discuss strategies for preparing the path. This is not meant to “lock in” any choices, just to open the discussion.</p>	<p>supervisory committee meetings. We will request that the ‘additional direction’ section of our current supervisory committee report includes a summary of such discussions with the goal of identifying mentors from industry or government. This type of mentorship is critical to guide students beyond the specific confines of their academic projects. To further enhance opportunities for meaningful non-academic mentorships, as suggested, we will also:</p> <ol style="list-style-type: none"> Invite our alumni and other industry/government leaders as seminar speakers and ample opportunities will be given to trainees to interact directly with them during their visits at McMaster. We will also connect our trainees to the Faculty of Science (FoS) alumni initiatives. We will coordinate with and leverage on the FoS mentorship program to further expand networking opportunities for our graduate students. This is a new initiative led by the FoS that expands on already successful similar programs (<i>i.e.</i> Women in Science and Engineering: WISE) and will give our CCB trainees an opportunity to connect with alumni and 	<p>also check that a summary of such discussions is included in the committee reports prior to signing them. P. Kruse and G. Melacini will also proactively suggest or solicit suggestions of CCB seminar speakers from industry and government. We will start from our substantial network of alumni. P. Kruse and G. Melacini will also pro-actively serve as liaisons between our trainees and the mentorship, micro-credential and alumni initiatives currently being led by the FoS. We will introduce our students to these opportunities in the initial training sessions as well as in our regular Q/A sessions with CCB graduate trainees, which typically occur twice a year. G. Melacini will add the LSO to the CB website.</p>	<p>ongoing mentorship and micro-credential initiatives led centrally by the Faculty of Science (FoS). The FoS is in the process of launching Graduate Career and Graduate Mentorship program pilots this Fall and full implementation over the next three years. The Science Career and Cooperative Education Office (SCCE) will be overseeing the career initiative. Students in both Chemistry and Chemical Biology graduate programs will have the opportunity to participate in these initiatives and be able to network with alumni, get career guidance, acquire new sets of skills through workshops and micro-credentials, and have experiential learning opportunities.</p>
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	<p>leaders in other fields as well. In addition, we will coordinate with the Science Career and Cooperative Education Office, who will be engaging in several career development projects to better support graduate students.</p> <p>iii. We will also rely on the 'microcredential' initiative in the FoS to offer opportunities for industry/management-related professional training to our students.</p> <p>iv. We will add a link to the Life Science Ontario (LSO) site to our CB website.</p>		
<p>6. Strategic plan for sustainability versus growth. The committee brought up the realities of graduate studies in Ontario and the evolution of doctoral and MSc caps. Faculty are under the impression that as other graduate units come and go; this will not be a problem. At the same time, there was no real strategy or consensus on how to react at a departmental level or the level of individual faculty to the transition from a</p>	<p>In alignment with the institutional graduate enrollment quota, our strategic priority is currently on the recruitment of top graduate students as opposed to further expansion (<i>i.e.</i> prioritize quality vs. quantity). While the number of chemical biology applications over the last three years has on average increased in excess of 40% relative to the previous three years, our most recent acceptance rates are now below 25%. This reflects our stringent acceptance criteria, especially considering that the applications we receive are often already pre-vetted by our faculty members through personal correspondence and interactions. Furthermore, the recent (2018-2020) 40% increase in the number of</p>	<p>P. Kruse and G. Melacini</p>	<p>We will continue to monitor our growth and consider a balanced growth vs sustainability model</p>

<p>growth model to a sustainability model. Specific Recommendations (where applicable): We recommend that Department analyze the consequence of the imposed cap to graduate student recruitment to estimate the risk for young faculty and the risk to a healthy distribution of students among various research groups.</p>	<p>applications speaks to the reputation of our faculty and demand for our program. Within the same timeframe, we have also witnessed a shift in the number of accepted students coming from undergraduate programs outside of McMaster. In 2018-2020, this non-MAC cohort has become much of our incoming class, which means that our program is highly visible, and its reputation is attracting students nationwide as well as internationally. Nevertheless, VISA students remain a minority because of increased tuition costs at the M.Sc. level and of the hesitation of most faculty members to accept foreign students directly into the Ph.D. program. The quality of our graduate students is also clearly reflected by their success in graduate scholarship applications (in excess of \$325K in scholarships awarded this year alone to chemical biology graduate students).</p> <p>The chemistry graduate program has seen steady enrolment numbers over recent years, with some fluctuations due to faculty renewal (retirements and new hires), so in a way we have been in a sustainability model for some time now. We accept less than 20% of applicants, with uptake limited by research grant funding. Our fraction of international students has remained steady at around 1/3, with domestic students being a healthy mix of graduates from our own undergraduate</p>		
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	<p>program(s) and from across Canada.</p> <p>As suggested, we have also analyzed the consequence of the imposed cap to graduate student recruitment and currently the distribution of students among research groups does not seem to overly favor senior PIs. Presently, the average number of chemical biology graduate students per PI is 2.7 for assistant, 3.0 for associate and 2.1 for full. Based on these data, it does not seem that the enrollment cap is penalizing our junior colleagues. However, we agree that support should be provided to ensure that such distribution of graduate students to PI in different ranks remains healthy over time.</p>		
<p>7. Review comprehensive exam. The evaluation criteria and parameters related to the comprehensive exam for both programs should be reviewed and the objectives of the review should include clarity, objective evaluation criteria and uniformity within each program. In addition, the review should acknowledge that this type of exam may be susceptible to unconscious biases and presents a risk</p>	<p>The overarching goal of the comprehensive exam remains the enhancement of breadth in the training of our doctoral students to complement the depth of their specific research projects. We are aware that such breadth challenge, defined by the 'distance from the research area of the student' and the time allowed to 'travel' it, may vary from group to group. Hence, careful central supervisions will be exerted to minimize student-to-student variance in breadth, while acknowledging that even with best intentions variations may remain due intrinsic differences among sub-disciplines and logistical scheduling constraints. In the case of the Chemical Biology comprehensive exam,</p>	<p>P. Kruse and G. Melacini</p>	<p>Winter/Spring 2022</p>

with respect to equity and inclusion.	this problem was exacerbated by the lack of a written component, but this has already been addressed as noted.		
8. Expanded graduate student representation. Include graduate student representatives on the advisory board for each program.	While we routinely consult with our graduate student base through surveys, follow up workshops, and regular Q/A sessions, we agree that student representation in the advisory boards offers a more direct means to include feedback from trainees. We have added one student representative to each graduate program advisory board, and we have also invited graduate student representatives (one Chem & one ChemBio) to our CCB departmental meetings.	G. Goward, P. Kruse and G. Melacini	Fall 2021

Faculty Response

We sincerely thank all three reviewers for their thorough and constructive review of the Chemistry graduate program and the Chemical Biology graduate program. The programs put together very thorough IQAP self-study documents that describe a wide range of activities to support interdisciplinary training of graduate students. The reviewer report highlights many strengths of this research-focused program, including its students and supervisors. This Dean's response is submitted jointly between Science and Health Sciences in recognition that the Chemical Biology Graduate Program is a joint program between those Faculties.

We have reviewed the program's response to the review and fully agree with proposed plans and timelines for improvement and enhancement. It should be noted that many of the recommendations are already being implemented or planned to be addressed in the near future. We agree with the proposed time frames and action plans on the remaining items. Both Faculties see the Chemical Biology graduate program playing a crucial role in producing high-quality trainees with expertise at the interface of Chemistry, Biochemistry and Medical Sciences, and are, therefore, committed to supporting it.

The occasion of the review was an opportunity to reflect on the collaborative relationship between the Faculties of Science and Health Science in offering the Chemical Biology Program, although it is noteworthy that the reviewers offered no comments in this regard. The administrative and

intellectual home of Chemical Biology is clearly in the Faculty of Science. However, the program is important to Health Sciences faculty who recruit students with strong undergraduate backgrounds in chemistry to work on research problems in biochemistry. Consultations within the Faculty of Health Sciences suggest that this relationship is currently working well, and we will continue to foster and monitor the collaboration to ensure that students have access to the excellent supervision and research opportunities in both Faculties.

We would like to highlight the recommendation for increased EDI training for faculty, staff and students. McMaster University and the Faculties of Science and Health Sciences are advancing our shared EDI strategic plan goals centred around inclusive excellence. We will support and encourage the programs in an enhancement in training and activities related to EDI.

With respect to the recommendation for increased professional development and career planning. The programs are actively working with supervisors and other stakeholders to implement the recommendation. Additionally, they will be supported by central initiatives coordinated by the Associate Dean of Graduate Studies (Science) office. Specifically, Faculty of Science is in the process of launching Graduate Career and Graduate Mentorship program pilots in the fall term 2021 and full implementation over the next three years. Students in Chemistry and Chemical Biology graduate programs will have the opportunity to participate in these initiatives and be able to network with alumni, receive career guidance, acquire new sets of skills through workshops and microcredentials, and have experiential learning opportunities.

Quality Assurance Committee Recommendation

McMaster's Quality Assurance Committee (QAC) reviewed the above documentation and the committee recommends that the program should follow the regular course of action with an 18-month progress report and a subsequent full external cyclical review to be conducted no later than 8 years after the start of the last review.

FINAL ASSESSMENT REPORT

Institutional Quality Assurance Program (IQAP) Review

eHealth M.Sc.

Date of Review: October 21st – 23rd , 2020

In accordance with the University Institutional Quality Assurance Process (IQAP), this final assessment report provides a synthesis of the external evaluation and the internal response and assessments of the eHealth graduate program. This report identifies the significant strengths of the program, together with opportunities for program improvement and enhancement, and it sets out and prioritizes the recommendations that have been selected for implementation.

The report includes an Implementation Plan that identifies who will be responsible for approving the recommendations set out in the Final Assessment Report; who will be responsible for providing any resources entailed by those recommendations; any changes in organization, policy or governance that will be necessary to meet the recommendations and who will be responsible for acting on those recommendations; and timelines for acting on and monitoring the implementation of those recommendations.

Executive Summary of the Review

In accordance with the Institutional Quality Assurance Process (IQAP), the eHealth program submitted a self-study in March 2020 to the Vice-Provost and Dean of Graduate Studies to initiate the cyclical program review of its graduate program. The approved self-study presented program descriptions, learning outcomes, and analyses of data provided by the Office of Institutional Research and Analysis. Appendices to the self-study contained all course outlines associated with the program and the CVs for each full-time member in the department.

Two arm's length external reviewers and one internal reviewer were endorsed by the Deans, Faculties of Business, Health Sciences and Social Sciences, and selected by the Vice-Provost and Dean of Graduate Studies. The review team reviewed the self-study documentation and then conducted a remote review on October 21st- 23rd, 2020. The review included interviews with the Provost and Vice-President (Academic); Vice-Provost and Dean of Graduate Studies, Associate Dean, Grad Studies and Research, Director of the program and meetings with groups of current students, full-time faculty and support staff.

The Director of the program and the Deans of the Faculty of Business, Health Sciences and Social Sciences submitted responses to the Reviewers' Report (December 2020 and March 2021 respectively). Specific recommendations were discussed and clarifications and corrections were presented. Follow-up actions and timelines were included.

- **Strengths**

- The interdisciplinary nature of the program with participation with three different faculties.
- The internship is central to the program, and effectively managed and run by the current coordinator. It is the principal tool that ensures student success and the achievement of learning outcomes for the program.

- The dedication of the teaching staff and its current management to the students and the program is essential for the program success.
- The incorporation of guest speakers from within and outside the university gives students a rich exposure to the field and the opportunity to specialize.
- **Areas for Enhancement or Improvement**
 - Re-evaluation and review of the program's vision and learning outcomes in order to articulate a clear description of the learning outcomes and the course content.
 - Engagement of senior eHealth specific leadership to both streamline and promote the program. The original leaders that created the program were internationally known, but they are no longer formally associated with the program. Therefore, the program must engage and support the next generation of eHealth leader(s) in order to ensure the continued relevance and success of the program.
 - Re-evaluation of the commitment of the partner faculties. Clear commitment of participating faculties in the continued evolution of the program content and structure is essential to keep it relevant to the field and its partner faculties. This shared vision of the program should be clear to the students and instructors and guide the relationship of the participating faculties.
 - Engagement of teaching resources who are academically trained and invested in eHealth as their area of specialization. The program lacks instructors who are experienced in the field of eHealth.
 - The thesis option is underutilized by the students and is nominally supported by the program. The program must evaluate whether a thesis option is viable and suited for this program, as currently the program is heavily reliant on the internship option which is quite successful and the students' preferred option.
 - Concomitant deployment of enhanced support (moral, resources) for the management of the program. Recognizing the strain it puts to manage an interdisciplinary program in terms of allocating dedicated time and workload relief to support program management.
 - In order to ensure the future relevance of this program a more systematic and partnered approach for engaging students and alumni in the governance of the program is essential.

Implementation Plan

Please outline the recommendations made by reviewers and indicate how you plan to address the recommendations in the chart below.

Please note that the reviewers provided both key recommendations in the Executive Summary and broader recommendations in the detailed sections of the report. Below, we follow the same pattern, addressing the key points in the Executive Summary area with reference to the detailed points below shown in brackets. Please note that the Executive Summary Recommendations section does not touch on all of the topics in the Detailed Recommendations section that follows.

Recommendation	Proposed Follow-Up	Responsibility for Leading Follow-Up	Timeline for Addressing Recommendation
Executive Summary Recommendations			
A. Support for a Design-focused Capstone project should be considered as an alternative, complement or replacement for the Research paper.	<ul style="list-style-type: none"> - The program team supports the idea of replacing the scholarly paper with a capstone project, in principle. We will explore the feasibility of this recommendation in terms of timeline and resource requirements (see 4.1). - If the scholarly paper remains a component of the program, we will develop revised guidelines and communications to encourage more variety in the topics and approaches taken by students (see 4.3, 4.4, 4.5, 4.6). 	eHealth Program Team	Begin exploration in 2021, propose changes in 2021/2022 academic year as needed, for implementation in 2022/2023
B. If thesis option is continued to be supported, a de-emphasis on industry internship and more focus on directed studies and research supervision should be considered.	<ul style="list-style-type: none"> - The program team supports the elimination of the thesis stream of the program to focus resources and attention on the course-based stream. We will explore the feasibility of this recommendation with key stakeholder groups (see 4.2). - If the thesis stream does remain, we agree that the nature of the internship should be prescribed for those students so that it is research focused (see 4.2). 	eHealth Program Team	Begin exploration in 2021, propose changes in 2021/2022 academic year as needed, for implementation in 2022/2023

Recommendation	Proposed Follow-Up	Responsibility for Leading Follow-Up	Timeline for Addressing Recommendation
C. The program must establish improved collaboration/ connection with relevant eHealth researchers and health-related entrepreneurship programs (health technology) at the university.	- Proactively and systematically engage eHealth researchers across campus in the activities of the program (see 1.1, 5.4, 5.5)	eHealth Program Team	Process design early 2021 for implementation in 2021/2022 academic year activities
D. There must be at a minimum one leading eHealth expert researcher/ academic associated with the instructor body to provide the necessary discipline specific expertise required to articulate the program's vision, mission and delivery of the right content.	<ul style="list-style-type: none"> - The composition of the program team is beyond the scope of influence of the program team. While we understand the concern raised, the process in place is for the Program Director to be selected by a committee and Program Leads assigned by the respective faculties. As such, the members of our team are a result of the applicant pool of interest for the director role, and the resources available within each faculty (see 5.1). - Efforts to ensure that our vision and mission remain relevant and aligned with curriculum are described in section 3 below. 	<p>Senior leadership of the contributing faculties</p> <p>eHealth Program Team</p>	<p>Ongoing, consider the needs of the eHealth program in hiring decisions and service assignments</p> <p>See section 3</p>

Recommendation	Proposed Follow-Up	Responsibility for Leading Follow-Up	Timeline for Addressing Recommendation
E. The program leadership must be provided with teaching release in order to create space for the effective management of the program, and to be able to develop and enhance their understanding of eHealth as a discipline.	- Addressing this recommendation is complicated given the involvement of three faculties in the management of the program. In practice, each faculty may decide the requirements of their members, and each faculty approaches this uniquely in the context of this program. In practice, the program team finds that we are quite resource constrained and spend the time that we have available addressing operational rather than strategic concerns. While we are able to utilize our budget to fund conference and training activities for the team, time is often the key constraint. It would be beneficial to the program if the coordinators and director each had more time to dedicate to the program and their eHealth development (see 5.2).	Senior leadership of the contributing faculties	Ongoing, consider the needs of the eHealth program in resource allocation decisions
F. The core teaching complement should either have or be given opportunities to develop interest and expertise in the field of eHealth as currently most of the instructors do not have an eHealth background which is affecting the learning outcomes and student appreciation of the topics.	<ul style="list-style-type: none"> - Three of the four core courses are taught by members of the eHealth program team who are provided with opportunities for development as mentioned above in E. - The eHealth elective courses all have instructors who are engaged in eHealth research and practice. 	(see E)	

Recommendation	Proposed Follow-Up	Responsibility for Leading Follow-Up	Timeline for Addressing Recommendation
<p>G. There should be continuity and stability in terms of instructor assignment to the program, such that instructors should be assigned to teach a course for multiple years to allow them to develop their own expertise in eHealth and to prepare high-impact content material for the course.</p>	<ul style="list-style-type: none"> - Addressing this recommendation is complicated given the involvement of three faculties in the management of the program. Each faculty contributes courses the program and has its own internal mechanisms for the assignment of instructors. - In general, there has been consistency of instruction for most courses. We now have teaching-track instructors teaching the core Engineering and Business courses, where these were formerly CLA instructors. It would be beneficial to move toward the participation of more permanent faculty members for continuity and development of eHealth courses (see 6.1). 	<p>Senior leadership of the contributing faculties</p>	<p>Ongoing, consider the needs of the eHealth program in hiring decisions and service assignments</p>

Detailed Recommendations			
1. Program			
1.1 Research in current and emerging eHealth topics is currently nominal, but it can be improved by engaging faculty members beyond the teaching core of the program.	While it is true that most of the eHealth Program Team have teaching-intensive appointments and nominal eHealth research, a great deal of eHealth related research is being done in pockets throughout the university. The Program Team agrees that we should more proactively and systematically engage these researchers in the activities of the program. We will add to our annual processes more efforts for systematic outreach within each of the participating faculties and systematic tracking of faculty member interest for engagement (curriculum, admissions, supervision, guest speaking).	eHealth Program Team	Process design early 2021 for implementation in 2021/2022 academic year activities
1.2 The interdisciplinary culture must be further enhanced by bringing together students from all three backgrounds (health, business and engineering) to do joint projects/assignment across the courses.	The instructors of the core courses will continue to encourage students to create diverse teams for course assignments and projects. Should we move toward a capstone project in place of a scholarly paper (discussed further below), we will ensure that those teams are composed of diverse skill sets as well.	eHealth Program Team (which contains core instructors)	Jan 2021- add to list of discussion topics for core course planning (to take place May 2021)

2. Admission Requirements			
2.1 The student cohort is predominantly from health and business backgrounds, with a nominal number of students entering the program with a computer science/engineering background. This is affecting the participation and value proposition of the engineering faculty. The admissions should be balanced between the three disciplines to have a truly interdisciplinary student cohort.	While attempts have been made over the years to balance out the backgrounds of the student cohort, efforts going forward will be more systematic and targeted. For the current admissions cycle, we have added a question to the application to determine how applicants became aware of the program. We will use this information, in combination with additional research, to target our recruitment efforts to venues of relevance to technically oriented students. Part of the challenge seems to be that students with strong technical background gravitate towards more technical masters programs, such as biomedical engineering, rather than an interdisciplinary program like eHealth.	eHealth Program Team & Program Admin	Analyze admissions data from the current cycle in May 2021, plan for next cycle in Jun-Aug 2021, implement plan in fall 2021.
2.2 The academic advisors assigned to the students should better match the backgrounds of students (e.g. assign health students to a health leader, business students to a business leader, computer science/engineering students to engineering leader).	In the earlier years of the program, students were matched to academic advisers with the same background upon entry to the program. This was problematic for two reasons: 1) the distribution of advising duties across the three faculty leads was uneven; 2) students are encouraged and often choose to explore a discipline other than their background once in the program and, as a result, often requested a change in adviser (creating administrative work). As a result of these challenges, we decided to revise the process so that students are now evenly and randomly assigned to an academic adviser upon entry, and encouraged to reach out to other program leads with targeted questions should the need arise. We will be sure to emphasize this process during orientation going forward.	Program Admin	Jan 2021- add to Orientation 2021 materials

3. Curriculum			
3.1 The curriculum needs a refresh to include current topics and to modularize the content. The current curriculum (including both core and electives) does not properly cover the breadth of eHealth, as such many important topics are not covered in the program.	<p>In preparation for the IQAP review, the Program Team reviewed the curriculum of other similar programs as well as industry association training offerings. This became the basis for our learning objectives, which we believe are well addressed by our core and elective courses. As such, we are uncertain about which eHealth topics the reviewers find lack coverage in the program. It is possible that we made an error in the scheduling of the reviewer meeting with program instructors. Since the instructors of the core courses (except stats) are also members of the program team, the instructors meeting was only with instructors of elective courses. This may have impacted the interpretation of the curriculum by the reviewers. We would like to follow up with the reviewers for clarification if that is possible.</p> <p>On an ongoing basis, the program will systematically scan the composition of similar programs and industry association training to keep curriculum relevant. We will also ensure that advisory board input is gathered on a regular basis as another perspective.</p>	eHealth Program Team & Program Admin	<p>Jan 2021- reach out to reviewers for clarification</p> <p>Summer 2021- plan research and advisory board activities</p> <p>2021/2022 academic year- conduct research, develop recommendations for any changes, pursue necessary university approvals for implementation in 2022/2023 academic year</p>
3.2 The core courses require a re-focus to better align with current eHealth theories, models and practices. The core courses should have a modular structure to accommodate the different topics within a course.	<p>As above in 3.1, we are uncertain about which theories, models, and practices are of concern as well as what exactly is meant by “modular structure.” We would like to follow-up with the reviewers for clarification if that is possible.</p>	eHealth Program Team	<p>Jan 2021- reach out to reviewers for clarification</p> <p>Summer 2021- investigate further based on reviewer input (in line with 3.1 above)</p>

3.3 The core courses should have an interdisciplinary focus that brings students from different backgrounds and a strong grounding in the core essentials of eHealth and how to apply them to eHealth. Tutorials, mentoring, supplementary courses should be identified so that students from different backgrounds can compensate or address any deficiencies they may have such that a shared minimum competency for the cohort can be achieved.	As discussed in 1.2 above, instructors will continue to support interdisciplinary team composition in eHealth courses. Further, we will develop roadmaps with suggested courses aligned toward particular career goals that students often have (project management, data analytics, eHealth research, etc.). This should help to facilitate course selection and the attainment of skills aligned with career goals. The core courses across the three faculties are designed to create a shared minimum competency across the disciplines, while the flexibility of the program allows for students to pursue their own career goals. We believe that this interdisciplinary foundation combined with flexibility in focus is a strength of the program.	eHealth Program Team	Summer 2021- develop career aligned course roadmaps for distribution to incoming cohort in 2021/2022
3.4 The selection of electives should be streamlined in terms of specializations where students can leverage their strengths (health, business, computer science/engineering) for more advanced work in eHealth.	See 3.3 above.		
3.5 The balance between core and electives needs a re-think since the core courses do not cover all relevant eHealth topics and the electives are insufficiently related to eHealth and do not provide topical eHealth knowledge.	As above in 3.1, we are uncertain about which topics are of concern. We would like to follow up with the reviewers for clarification if that is possible.	eHealth Program Team	Jan 2021- reach out to reviewers for clarification Summer 2021- investigate further based on reviewer input (in line with 3.1 above)

4. Teaching and Assessment			
4.1 Support for a Design-focused Capstone project should be considered as an alternative, complement or replacement for the Research paper. Non-thesis students could be introduced to the idea of a “capstone-like” project early in their studies and exposed to ideas for projects (former students, entrepreneurship hubs on campus, researchers, and companies with interested projects).	The program team supports the idea of replacing the individual scholarly paper with a group capstone project, in principle. This change would likely be well received by students, and the exercise would be more meaningful. More detailed thought and planning would be needed to determine the resource needs, especially if this were to involve community engagement on an ongoing basis. We would also need to explore how this could fit into the timeline of the program since students are with us for 8 months, on internship for 8 months, and then back for only one term.	eHealth Program Team	Summer 2021- working session to explore the possibility of a capstone project replacing the scholarly paper 2021/2022 academic year- conduct research, develop recommendations for any changes, pursue necessary university approvals for implementation in 2022/2023 academic year
4.2 If thesis option is continued to be supported, a de-emphasis on industry internship and more focus on directed studies and research supervision should be considered.	The program team supports the elimination of the thesis stream of the program to focus resources and attention on the course-based stream. The program attracts few thesis students and the support needed by those students is significantly higher than for course-based students. Further, we have had a number of instances where students join through the thesis program and then request to switch to course-based. We will explore the idea of removing the thesis stream with key stakeholder groups. If the thesis stream does remain, we agree that the nature of the internship should be prescribed for those students so that it is research focused.	eHealth Program Team	Summer 2021- working session to explore the possibility of eliminating the thesis stream 2021/2022 academic year- conduct research, develop recommendations for any changes, pursue necessary university approvals for implementation in 2022/2023 academic year

4.3 If the research paper is to be continued, then its focus should be shifted from a literature review to deeper investigations in useful and relevant eHealth topics. Students can be encouraged to pursue small-scale research-based exercise that can be reported in the research paper.	The program committee supports the replacement of the scholarly paper with a capstone project, as discussed above in 4.1. If it is determined that this is not feasible, we agree that the scholarly paper exercise could be enhanced. While the current guidelines provided to students do provide for different types of papers, students gravitate toward a literature review. Description and communication could be revised to encourage more diversity in the nature of the papers.	eHealth Program Team	Pending result of 4.1 above, revise scholarly paper documentation and communication if needed during same timeframe as 4.1
4.4 The research paper requirement can be modified to team-based development projects as this will provide a practical hands-on experience, and also help to engage engineering faculty members.	See 4.1 above		
4.5 The process of finding a supervisor and readers for the research paper needs to be streamlined and simplified—currently students face difficulties in both finding and engaging supervisors.	The program committee supports the replacement of the scholarly paper with a capstone project, as discussed above in 4.1. If it is determined that this is not feasible, we agree that the supervision of scholarly papers should be streamlined. We will suggest to key stakeholders that the number of readers could be reduced from two to one without having a significant impact on the quality of the papers produced.	eHealth Program Team	Pending result of 4.1 above, revise scholarly paper process if needed during same timeframe as 4.1

4.6 The load of research paper supervision should be evenly distributed across the teaching faculty associated with the program. Furthermore, to ensure supervision quality and timely feedback there should be an upper limit to the number of research papers one faculty member can supervise.	The preliminary steps toward the scholarly paper are supported by academic advisers (faculty leads) while students are on internship through an AvenueToLearn online course. Since students are evenly distributed across the advisers, the workload is also evenly distributed. Once students have developed their proposal with their academic adviser, they make efforts to secure a first reader whose expertise aligns with their topic of interest. The requirement is that this first reader be a faculty member at McMaster, not necessarily within the teaching faculty of the eHealth program. Perhaps this was not clear during the reviewers' visit and meetings. In general, this wide net for finding supervision should result in limited number of papers per supervisor, which has been the case more recently. To address the issue of timely feedback, we do have guidelines in development for each of the stakeholders in the scholarly paper process to enhance the understanding and efficiency of the process for all.	eHealth Program Team	Early 2021- finalize scholarly paper guidelines to share with students going on internship in summer 2021 (for Apr 2021 "transition to the workplace" seminar)
4.7 The program management, through consultation with the teaching faculty, should prepare a list of potential research paper topics with assigned supervisors to assist students determining their research paper topic and supervisor.	The intention of the current scholarly paper process is to provide students with the opportunity to explore a topic of interest in a self-guided research exercise. Students are encouraged to—and often choose topics that—extend the knowledge gained during their internship experience. While we appreciate efficiencies related to the recommendation, we believe that the existing approach provides a more meaningful learning experience.		

5. Resources to Meet Program Requirements			
5.1 There must be a leading eHealth expert researcher/ academic articulating the program's vision and mission. This is important as currently the program lacks relevant leadership.	The composition of the program team is beyond the scope of influence of the program team. While we understand the concern raised, the process in place is for the Program Director to be selected by a committee and Program Leads assigned by the respective faculties. As such, the members of our team are a result of the applicant pool of interest for the director role, and the resources available within each faculty. Efforts to ensure that our vision and mission remain relevant and aligned with curriculum are described above in section 3.	eHealth Program Team Senior leadership of the contributing faculties	See section 3 Ongoing, consider the needs of the eHealth program in hiring decisions and service assignments
5.2 The program management must be given dedicated time to manage the program, and also to develop their understanding of eHealth as a discipline.	Addressing this recommendation is complicated given the involvement of three faculties in the management of the program. In practice, each faculty may decide the requirements of their members, and each faculty approaches this uniquely in the context of this program. In practice, the program team finds that we are quite resource constrained and spend the time that we have available addressing operational rather than strategic concerns. While we are able to utilize our budget to fund conference and training activities for the team, time is often the key constraint. It would be beneficial to the program if the coordinators and director each had more time to dedicate to the program and their eHealth development.	Senior leadership of the contributing faculties	Ongoing, consider the needs of the eHealth program in resource allocation decisions

5.3 Teaching stream professors must have sufficient exposure (conferences, training), faculty support (researchers, faculty leaders), and time for mentoring students, curriculum development, etc.	Three of the four eHealth Program Team members have teaching-intensive appointments. As such, the response to 5.2 applies here also.		
5.4 There must be an annual meeting of eHealth instructors, vice-deans from each faculty and leading faculty (research / entrepreneurship) to review program gaps and decide upon curriculum updates and assignment of suitable teaching resources.	<p>We agree that there should be a more structured approach to stakeholder engagement. We would like to ensure that annual stakeholder engagement activities take place:</p> <ul style="list-style-type: none"> - the advisory board needs to be resurrected and cultivated proactively - an annual update meeting with consistent metrics provided year over year should be set with the Associate Deans of the program - although alumni have traditionally participated in the advisory board, an annual alumni event would also be useful 	eHealth Program Team	Process design early 2021 for implementation in 2021/2022 academic year activities
5.5 There must be improved collaboration/connection with relevant researchers and entrepreneurship programs (health technology) at the university.	We agree with this recommendation and have addressed the researchers' component above in 1.1. In addition, coordination and collaboration among the health technology entities at the university would be useful. We will pursue a community of practice model to create and maintain connection to the various relevant bodies on campus.	eHealth Program Team	Process design early 2021 for implementation in 2021/2022 academic year activities

5.6 The rather long list of electives can be strategically reduced and stratified to minimize teaching resources whilst providing focused themes for students to pursue.	In 3.3 above, we address the creation of goal-oriented course roadmaps and a streamlined list of elective topics. It is possible that there was a lack of clarity around the provision of elective courses to eHealth students. The eHealth program offers only a few elective courses; the others on the list are offered through the participating faculties and, thus, do not impact the program's teaching resources.		
6. Quality Indicators			
6.1 The program should involve more tenure-track faculty and reduce its dependency on CLAs which by virtue of their temporary contract cannot provide the long term commitment required to maintain the program.	While the immediate succession issues identified in the previous review have been addressed, it is true that the program team is made up entirely of non-permanent faculty at this point in time. As discussed above in 5.1, the members of our team are a result of the applicant pool of interest for the director role, and the resources available within each faculty for lead roles.	Senior leadership of the contributing faculties	Ongoing, consider the needs of the eHealth program in hiring decisions and service assignments
6.2 The program should provide opportunities to instructors to develop eHealth knowledge and even participate in eHealth research activities.	See 5.2 above		
8. System of Governance			
8.1 The governance of the program should consider engaging students and alumni in a more systematic manner in the governance and management of the program (perhaps through the newly-created student association).	The engagement of alumni is addressed above in 5.4. Over the past year, student representatives from the new student association have attended several of our team meetings. We will continue to encourage them to send a representative.	eHealth Program Team	Ongoing

8.2 There must be an annual meeting of eHealth instructors, Vice-deans from each faculty and leading faculty (research / entrepreneurship) to review program gaps and curriculum updates. It should include student, alumni, and industry representatives and other relevant community leaders and stakeholders.	See 5.4 above		
8.3 The program should revisit its mission and mandate with an open discussion about the role and commitment from the partner faculties. It is worth asking the question whether this program should be shared by 3 faculties or with 2 faculties who are more interested and invested in eHealth.	Since the time of the last review (2013) there have been significant steps to even out the contribution by the three faculties. Relevant metrics to this concern should be discussed annually in the updated provided to the Associate Deans (see 5.4). If the scholarly paper is replaced with a capstone project as described above, this may create new ways for faculty members from the three faculties to engage.	eHealth Program Team	Annual update as discussed in 5.4 Capstone project as discussed in 4.3
8.4 Each partner faculty should assess and articulate their ability to engage their tenure-track faculty to contribute to the program.	The eHealth program is pleased to provide Senior Leadership with any data needed to support this assessment. We have observed over time that faculty in FHS are often the most willing to engage. We wonder if this may be at least in part because FHS has a mechanism (MacFacts) whereby faculty members are recognized for their various contributions. Perhaps a similar mechanism can be explored in the other faculties.	Senior leadership of the contributing faculties	At their discretion

9. Academic Services			
9.1 The program management could offer career counselling to the students, as the students are coming from diverse backgrounds it is important that they can foresee a suitable career path.	Currently the CDRM does provide individual career coaching sessions with all students during the internship preparation process. Perhaps this was not articulated in the self-study or during the visit.		
9.2 The program management could benefit by establishing an advisory committee comprising eHealth professionals, alumni, industry, and eHealth academics.	See 5.4 above		
9.3 The program management should include tenured faculty members to ensure continuity. Currently, the program management largely comprises of non-permanent faculty members.	See 6.1 above		
9.4 The program management should include individuals who are academically invested in eHealth, and preferably senior faculty members.	See 5.1 above		
9.5 The program management should be consulted regarding teaching assignment decisions.	While the program team would appreciate this consultation, we recognize the process and resource constraints in each of the participating faculties.		

Faculty Response

The Faculties of Business, Engineering and Health Sciences are grateful to the reviewers for the scope and depth of their report in assessing the quality of the eHealth program. They had received and reviewed the recommendations of the program in regard to the report's findings and have every confidence that the program leadership will address the recommendations.

They note that the reviewers identified several strengths of the program including the excellence of the new and graduating students, the dedication of teaching staff and good quality of instruction, and the importance of the internship experience for student learning.

Regarding suggested changes to the curriculum, the Faculties are committed to working with the program leadership to make appropriate changes. For example, they encourage the program to consider introducing a design-focused capstone project and agree that it may be an excellent innovation in the program. On the other hand, they are concerned about the program's suggestion to eliminate the thesis option, and will support a careful review of this option and its possible impact on eHealth research at McMaster. They do agree with the reviewers' recommendation to de-emphasize the internship for students under that option.

They were particularly struck by the reviewers' suggestion that the program is currently disadvantaged by low involvement of eHealth researchers and the absence of a "leading eHealth expert" at the institution. They will encourage the program to evaluate this concern and to consider whether the program is sufficiently engaged with eHealth researchers throughout the campus and off-campus members of the industry. They agree with the reviewers' broader observation that it is timely for the three faculties to reconsider their commitments to the program and to eHealth research and practice. This conversation among the faculty deans is underway. They note that the incoming Dean of the Faculty of Business is a leading eHealth researcher.

They agree that the Director should receive teaching relief and have confirmed that she does but do not see the same need for the Program Leads; it would be inconsistent with the operations of other programs to give teaching relief to the entire leadership team. In the Faculty of Health Sciences, discussions are underway to ensure the stability of the faculty position of the FHS Lead. They also agree that having some stability in terms of instructor assignments is important. They note that with several recent new faculty additions to the program, they expect that the program will have that stability going forward.

A point that resonated strongly with them in the report was the need for the leadership to re-connect with eHealth experts now that the original architects of the program have retired. Per the MOU signed by the three Faculties in 2018, a committee was to be established, "*MSc eHealth Program External Advisory Committee*" in order to provide this very needed connection with its industry. Much of the recommendations by the program would be preferably enacted upon with the guidance of this advisory committee. This committee may similarly prove helpful in connecting the program with suitable instructors for the courses which seem to be of concern to the reviewers. As a result, they will be trying to strongly motivate and aid the program in reconvening this advisory committee as soon as possible.

Overall, they are satisfied by the responses of the program to reviewers' concerns and look forward to receiving more details about their proposed improvements as time progresses.

Quality Assurance Committee Recommendation

In their report, the external reviewers noted that the program itself was of good quality; however, several issues were raised regarding the program, which resulted in several recommendations, including recommendations to review and assess the current leadership plan. The QAC agreed that the program could benefit from engaging in an earlier review to assess the program's progress on the various recommendations. As a result, the Quality Assurance Committee is recommending that the e-Health program should follow a modified course of action with an 18-month progress report and a full external cyclical review to be conducted no later than 4 years from the last review to assess the follow-up actions' impact on the program.

FINAL ASSESSMENT REPORT

Institutional Quality Assurance Program (IQAP) Review

Health Policy Ph.D.

Date of Review: January 26th and 27th

In accordance with the University Institutional Quality Assurance Process (IQAP), this final assessment report provides a synthesis of the external evaluation and the internal response and assessments of the Ph.D. program delivered by Health Policy. This report identifies the significant strengths of the program, together with opportunities for program improvement and enhancement, and it sets out and prioritizes the recommendations that have been selected for implementation.

The report includes an Implementation Plan that identifies who will be responsible for approving the recommendations set out in the Final Assessment Report; who will be responsible for providing any resources entailed by those recommendations; any changes in organization, policy or governance that will be necessary to meet the recommendations and who will be responsible for acting on those recommendations; and timelines for acting on and monitoring the implementation of those recommendations.

Executive Summary of the Review

In accordance with the Institutional Quality Assurance Process (IQAP), the Health Policy Ph.D. program submitted a self-study in December 2020 to the Vice-Provost and Dean of Graduates to initiate the cyclical program review of its Ph.D. program. The approved self-study presented program descriptions, learning outcomes, and analyses of data provided by the Office of Institutional Research and Analysis. Appendices to the self-study contained all course outlines associated with the program and the CVs for each full-time member in the department.

Two arm's length external reviewers and one internal reviewer were endorsed by the Deans, Faculty of Health Science, Social Sciences and Business and selected by the Vice-Provost and Dean of Graduate Studies. The review team reviewed the self-study documentation and then conducted remote review on January 26th and 27th, 2021. The review included interviews with the Provost and Vice-President (Academic); Vice-Provost and Dean of Graduate Studies, Faculty Deans, Associate Deans, Grad Studies and Research, Director of the program and meetings with groups of current students, full-time faculty and support staff.

The Director of the program and the Dean of the Faculty of Health Sciences, Social Sciences and Business submitted responses to the Reviewers' Report (May 2021 and July 2021). Specific recommendations were discussed and clarifications and corrections were presented. Follow-up actions and timelines were included.

Strengths

- The program is extremely well-aligned with the priorities of the University.
- The program attracts outstanding students. The admissions process and the curriculum serve the program's learning objectives.
- The program is recognized for its strong rigor and deep intellectual engagement, both inside and beyond the classroom.

- Available resources are used effectively. The long-standing collaboration with associated departments is efficient and works well.
- The quality of graduate supervision is high and strongly appreciated by the students.
- The new emphasis on career competencies is important and demonstrates the program's alignment with recent innovations in health services and policy research training programs in Canada.
- The very strong leadership of the Program Chair, Dr. Julia Abelson and the effective administrative support from Sheri Burns (Program Administrator) have resulted in strong support of, and responsiveness to students' concerns, especially in the context of the COVID-19 pandemic.

Areas for Program Improvement and Enhancement

- The definition of the Social Organization track remains vague. Though this has both advantages and disadvantages, a working to develop a clearer identity may help attract both faculty and students. Increasing the availability of relevant (and core) courses should also be part of this process.
- The form and the content of the comprehensive exams may be re-examined in order to balance benefits gained from students' engagement with a large amount of interdisciplinary material (for both breadth and depth) with the costs of the associated burden.
- Opportunities to facilitate links between various policy programs on campus, and to strengthen students' connections to their supervisor's home department, should be explored to maximize benefits across the university.
- Faculty renewal and succession planning will be important to ensure the program has active champions in the coming years.
- The expectation that supervisors partially fund PhD students may differ from their home departments and can be a major challenge for junior faculty. Opportunities to develop central financing arrangements and additional supports to facilitate supervision by new and junior faculty members should be considered.
- MOUs with affiliated Departmental Chairs regarding adequate compensation for teaching contributions to interdisciplinary programs and a stated commitment to faculty participation in such programs may facilitate program sustainability.

Recommendation	Proposed Follow-Up	Responsibility for Leading Follow-Up	Timeline for Addressing Recommendation
Program Level (Governance and Resourcing)			
Adequate resources should be devoted to support the program doing what it already does well, and to enable it to take advantage of a growing interdisciplinary community at McMaster and beyond (this includes exploring the idea of central program financing in	Meetings with relevant Deans and Associate Deans to discuss the resourcing of interdisciplinary programs. Anything else is outside of program control.	Program Director	June 2021 – Aug 2022

Recommendation	Proposed Follow-Up	Responsibility for Leading Follow-Up	Timeline for Addressing Recommendation
alignment with University's increasing emphasis on offering interdisciplinary programs).			
More explicit recognition should be given to the community benefits of affiliating with interdisciplinary programs in merit review and tenure and promotion processes.	Meetings with Associate Deans and Department Chairs to discuss opportunities for reinforcing the benefits of affiliating with interdisciplinary programs like HP. Anything else is outside of program control.	Program Director	June 2021 – Aug 2022
Faculty renewal and succession planning will be important to ensure the program has deeply committed faculty in the program who will be active champions for the program in coming years.	Meetings with Associate Deans and Department Chairs described above will include discussions regarding faculty renewal and succession planning and opportunities to leverage complementary interests and/or gaps to fill.	Program Director	June 2021 – Aug 2022
Development of MOUs between the health policy program and its affiliated departments to create more program sustainability, to help address succession planning issues and to encourage adequate recognition of, commitment to, and compensation for teaching in interdisciplinary programs.	Meetings with relevant Associate Deans and Department Chairs to establish MOU between program and affiliated Faculties and departments.	Program Director	June 2021 – Aug 2022
Curriculum			
Review and renewal of the Social Organization field to identify relevant domains of knowledge and courses that provide a clearer identity for the field while allowing for appropriate tailoring and flexibility to support focused study within the broader field.	Working group to be established to oversee this activity; activities may include: - faculty/student/program alum survey - review of field designations in comparable programs	Program director and key program faculty and students	June – December 2021
Review and renewal of course content to include the work of and frameworks from indigenous researchers and a decolonized perspective.	These activities are already under way – additional readings and sessions were added to the doctoral seminar and breadth comp exam reading lists in 20-21. A living document and repository of resources will be created for	Program director and Executive Committee members (faculty and students)	June – December 2021

Recommendation	Proposed Follow-Up	Responsibility for Leading Follow-Up	Timeline for Addressing Recommendation
	students and faculty members to access.		
Solidify the availability of qualitative methods course offerings within the program and across the University.	We are committed to offering our students reliable access to the program's qual methods course (HP 747) at a minimum of every other year, conditional on being able to secure a faculty member to teach this course. We will seek commitments from affiliated depts and programs to ensure access to other qual course offerings on campus as needed.	Program director + relevant program faculty	June 2021- August 2022
Teaching and assessment – Comprehensive exams			
Review current structure of comprehensive exams (i.e., 7-hour sit down exam) and consider the replacement of the methods and field exams with a take-home style exam or grant application (for methods) and a paper (for disciplinary-focused exam).	Working group to be established to oversee this review; activities to include: - faculty/student/program alum survey to assess strengths and weaknesses of current structure and to identify alternatives - review of comp exam structures in comparable programs	Program director with comp exam committee members and students	June – October 2021
Enhance communications with students about the exams to reinforce the purpose and benefits of the process and to help in managing exam-related stress (draw on upper-year students and program grads to help with this).	The program currently devotes considerable time and effort to orienting students to the purpose and benefits of the comprehensive exam process in Fall & Winter doctoral seminars. We will continue to look for ways to enhance communications in this area, particularly as we undertake our review of the current structure.	Program director and comps review team	September 2021 – August 2022
Quality indicators			
Program expectations regarding time to completion should be more clearly communicated to students and faculty with guidance provided about student funding sources beyond the four-year in-time period (viewed as especially important for international	This recommendation is well received. Planned follow up includes an in-depth review of the program's time to completion data, the specific reasons associated with completing outside the 4-year in-time period, funding opportunities available and criteria to be used to determine student funding support beyond the 4 th year of study.	Program director and Program admin	July 2021 – Aug 2022

Recommendation	Proposed Follow-Up	Responsibility for Leading Follow-Up	Timeline for Addressing Recommendation
students).			
Program should consider subsidizing 1-2 years of student funding for junior faculty members.	This recommendation relates to more fundamental issues of how interdisciplinary programs are supported (discussed in the program section). Challenges related to student funding support aren't restricted to junior faculty members only. As the reviewers noted, they are an issue for <u>all</u> faculty members in Social Sciences and Business, in particular, where students are more generously supported by their home departments, and don't require the same level of faculty contributions that is generally expected in the Faculty of Health Sciences.	Program director and Associate Deans	July 2021 – Aug 2022
Program Enhancement			
Review and take stock of recently introduced career competencies initiative to identify relevant and appropriate supports for students to monitor and complete these in a manageable way.	We plan to survey our faculty and students to assess their experience with the career competencies initiative since its introduction into the program in Fall 2020.	Program director and program admin	May - September 2021
Increase opportunities for building connections between the Health Policy program and other policy-related programs and initiatives across the University to leverage complementary skills, explore shared interests, and to deepen students' network of peers.	The Health Policy Program has, historically, fostered links with other policy-relevant programs and initiatives throughout the University through its close relationship with the Centre for Health Economics and Policy Analysis (CHEPA) which includes representation from the same Faculties and Departments that contribute to the HP Program. We will seek to further leverage these relationships with a particular focus on enhancing the sense of community among policy-oriented students at McMaster both across and within Faculties and Departments.	Program director with program executive (faculty and students) and student ambassadors	July 2021- Aug 2022
Enhancing program material and communications to help students navigate "how things work" more effectively and efficiently (with support from	There are numerous "how things work" resources already available to students in the Student Handbook and through the program's incoming student orientation. We recognize,	Student representatives and program admin	June – December 2021

Recommendation	Proposed Follow-Up	Responsibility for Leading Follow-Up	Timeline for Addressing Recommendation
upper-year PhD students, program graduates and through strengthening of the existing Buddy System).	however, that there may be additional informal knowledge about the program's workings that might lend itself to being more systematically organized and communicated. We will seek to identify key areas for enhanced communication between the program, students and supervising faculty members.		

Faculty Response

The Deans thanked the reviewers for their thorough, thoughtful, and constructive review of the PhD program in Health Policy at McMaster University. They appreciated that the reviewers identified strengths of the program, including the excellence of the students, its rigor and intellectual engagement, and the strong leadership team. They recognized that the program is well aligned to the priorities of the institution and is responsive to the career development needs of the students.

They reviewed the program's response and support their plans to address the recommendations in the report. They were thankful for several thoughtful suggestions about the curriculum, and are confident that these would be carefully considered by the HP program leaders.

They noted that the challenges and rewards of interdisciplinarity are a key theme that tied together many of the reviewers' comments and recommendations. They believed that the occasion of the review is an important opportunity for the three participating Faculties to review and discuss their commitments to the program, and to the overall project of interdisciplinarity at McMaster. They agreed with the reviewers' suggestion to consider the development of an MOU, and noted this would be a helpful way to structure and motivate the discussion among the Faculty deans.

An MOU is now standard practice for inter-Faculty programs; they noted that although there is currently no such document that addresses issues of governance and shared purpose, there is a detailed framework for distributing costs and revenues, and it is more sophisticated than is typical in an MOU. The framework was developed prior to the introduction of the activity-based budget model at McMaster, so it may be useful to review the mapping between the framework and budget flows. However, it was unclear to them that the institution's activity-based budget is necessarily a barrier to interdisciplinarity, as suggested in the report. The budget model does clarify how the costs of programs must ultimately be supported by program revenue and through deliberative decisions about their academic and financial priorities. The

reviewers' recommendation that the "central university" direct long-term financial support to any particular program is not consistent with this more general allocation framework. Similarly, while they agree that junior faculty may benefit from additional stipend funds to recruit graduate students, this is largely a matter of the priorities of academic departments with respect to faculty relations and hiring. The graduate programs do contribute importantly to this enterprise through their vigorous support of students' applications for extramural funding, and they congratulated the HP program director and faculty for their success in this regard.

The reviewers note that research and education about health policy is distributed throughout the institution in ways that do not necessarily intersect effectively with the HP PhD program. The Deans supported the program's proposed efforts to foster these connections. The review also includes broader questions raised about how to support interdisciplinary activity through departmental hiring, merit, tenure, and promotions. Ultimately, these processes necessarily reflect the aspirations and priorities of departments and must be considered in that light in renewed discussion among the program's institutional stakeholders.

Quality Assurance Committee Recommendation

McMaster's Quality Assurance Committee (QAC) reviewed the above documentation and the committee recommends that the program should follow the regular course of action with a progress report and subsequent full external cyclical review to be conducted no later than 8 years after the start of the last review.

FINAL ASSESSMENT REPORT

Institutional Quality Assurance Program (IQAP) Review

UNENE MEng

Date of Review: April 7th, 8th and 9th

In accordance with the University Institutional Quality Assurance Process (IQAP), this final assessment report provides a synthesis of the external evaluation and the internal response and assessments of the M.Eng. delivered by UNENE. This report identifies the significant strengths of the program, together with opportunities for program improvement and enhancement, and it sets out and prioritizes the recommendations that have been selected for implementation.

The report includes an Implementation Plan that identifies who will be responsible for approving the recommendations set out in the Final Assessment Report; who will be responsible for providing any resources entailed by those recommendations; any changes in organization, policy or governance that will be necessary to meet the recommendations and who will be responsible for acting on those recommendations; and timelines for acting on and monitoring the implementation of those recommendations.

Executive Summary of the Review

In accordance with the Institutional Quality Assurance Process (IQAP), the UNENE program submitted a self-study in March 2020 to the Vice-Provost and Dean of Graduate Studies to initiate the cyclical program review of its M.Eng. program. The approved self-study presented program descriptions, learning outcomes, and analyses of data provided by the Office of Institutional Research and Analysis. Appendices to the self-study contained all course outlines associated with the program and the CVs for each full-time member in the department.

Two arm's length external reviewers and one internal reviewer were endorsed by the Dean, Faculty of Engineering, and selected by the Vice-Provost and Dean of Graduate Studies. The review team reviewed the self-study documentation and then conducted a review on April 7th, 8th and 8th, 2021. The visit included interviews with the Provost and Vice-President (Academic); Vice-Provost and Dean of Graduate Studies, Faculty Dean, Associate Dean, Grad Studies and Research, Director of the Program and meetings with groups of current students, full-time faculty and support staff.

The Director of the Program and the Dean of the Faculty of Engineering submitted responses to the Reviewers' Report (August 2021). Specific recommendations were discussed and clarifications and corrections were presented. Follow-up actions and timelines were included.

- **Strengths**

- a. Focused, relevant content for the nuclear professional needing an M. Eng.
- b. Experienced nuclear professionals sharing deep experience pertinent to careers of students.
- c. Review courses to level the field for the heterogeneous background of the students.
- d. Timing of course so working professionals can enroll in program.
- e. Collaboration with the university network.
- f. Small class size and individual attention for students in the courses.

- **Areas for Improvement**

- 1. Work with University office of Diversity and Inclusion to evaluate accessibility of the courses.
- 2. Evaluate the pedagogy used, especially the weekend long, lecture focused course delivery.
- 3. Institute regular, structured advising for students in program.
- 4. Explore increasing target audience within the nuclear industry and diversifying course offerings.
- 5. Create stronger ties to the rest of the university, to better use university resources.
- 6. Develop mechanism for maintaining institutional knowledge about the program.

Summary of the Reviewers' Recommendations with the Department's and Dean's Responses

No	Recommendation	Proposed Follow-Up	Responsibility for Leading Follow-Up	Timeline for Addressing Recommend.
1	Work with University office of Diversity and Inclusion to evaluate accessibility of the courses.	Action 1.1 UNENE will gather information from member organizations regarding EDI practices, and hold a workshop with the objective to identify how to adopt and apply some of the recommended guidelines and activities specific to nuclear education and research and to UNENE.	Jerry Hopwood	Sep 2022
2	Evaluate the pedagogy used, especially the weekend long, lecture focused course delivery.	Action 2.1 The current four-alternate weekend format is the result of experimentation early in the program. The current format, while not as good as a 13-week semester, is a compromise to accommodate working students. We have not identified anything better that fits our constraints. UNENE will further evaluate options in cooperation with stakeholders and propose changes if a better model is identified.	Nik Popov	Sep 2022

		Action 2.2 Action UNENE will meet with the MacPherson Institute at McMaster University and seek their advice about making our pedagogy more effective. The Teaching and Learning Centre at Ontario Tech. University fills a similar role, and might also assist us, especially for digital classrooms. Assuming they give useful guidance, we will pilot the ideas in one or more selected courses in 2022/2023, and then decide on broader implementation.	Nik Popov	Sep 2022
		Action 2.3 We will also pilot a “flipped classroom” for one or two selected topics in one of our 2021/2022 courses. The four-weekend format of UNENE courses poses a special challenge in implementing this approach (for example it cannot be sprung on students at the first weekend), so the pilot will tell us what does and does not work.	Victor Snell	Jan 2022
3	Institute regular, structured advising for students in program.	Action 3.1 UNENE already regularly requests student feedback on the completed courses, and input in scheduling future courses. Also, UNENE conducts discussions with student groups when required. UNENE will introduce regular student meetings twice a year.	Nik Popov	Jan 2022
		Action 3.2 UNENE will introduce regular student meetings with each student individually to discuss student progress, needs and plans.	Nik Popov	Jan 2022
4	Explore increasing target audience within the nuclear industry and diversifying course offerings.	Action 4.1 UNENE already has contacts with industry partners in terms of finding ways to increase student admissions. UNENE will continue with meetings with the senior management from the industry with the intent to find ways for increased student population.	Jerry Hopwood	Dec 2022
		Action 4.2 UNENE will explore possibilities with the CNS, OCNI and other industry organizations to organize webinars and seminars as part of the outreach to employees in various industry organizations.	Jerry Hopwood	Sep 2022
		Action 4.3	Nik Popov	Sep 2022

		UNENE will explore ways to use graduate students and alumni students as “ambassadors” of UNENE in their organizations and will explore objectives and methods to be used for increasing awareness of employees with the UNENE M.Eng. program.		
5	Create stronger ties to the rest of the university, to better use university resources.	Action 5.1 UNENE will organize regular annual meetings with their university colleagues at McMaster SGS as well their partner universities to communicate and share developments on resources, policies and procedures such as academic integrity, grading tools, petitions, and admissions processes.	Nik Popov	Mar 2022
6	Develop mechanism for maintaining institutional knowledge about the program.	Action 6.1 UNENE officers with M.Eng. program responsibilities to compile the UNENE program handbook and prepare a description of their on-going duties and activities regarding the program, to allow transfer of duties if needed.	Nik Popov	Sep 2022
		Action 6.2 UNENE to prepare archive materials of all courses delivered, to provide basis for a new instructor to come in more readily in future.	Areti Tsiliganos	Sep 2022

Faculty Response

UNENE is an impressive program that manages to collaboratively work between five principal universities to improve the knowledge and skills of technical persons in the Nuclear industry. The IQAP review completed this spring highlights a well-managed program with satisfied students, though the Faculty recognized there were some significant areas needing improvement as well. The review was specifically focused on the Master of Engineering degree, not addressing the diploma which has been available for only a short period of time. The Faculty agreed that closer connections to the resources of the university would be very beneficial to the program and that some of the technological focus in the courses would benefit from updating. However, the Faculty also has a number of some concerns with the review since the reviewers made quite a few recommendations on what seems like an agenda contrary to the facts.

While the Faculty was very supportive of meaningful advancement in EDI across their programs, the extensively negative coverage given by the reviewers to the topic was unnecessary, uninformed, and

most comments were far outside of the scope of an IQAP review. The review lacks a credible examination of the program when it comes to the topic of EDI. For example, the reviewers talk about needing to attract a more diverse student population – but they were never told what the composition of the classes was. Plus, since this program only attracts students from the nuclear industry, they should be reflecting on whether the courses are attracting a diverse representation from that population. They complain about weekend courses, though they know everyone who is a student also works in the industry, and seem to be manufacturing an gender bias without evidence or even reasonable cause. The Faculty supports the program seeking guidance from the Equity and Inclusion Office since nothing but positive improvements can come about from questioning the status quo but were largely disappointed that the reviewers choose to pursue an agenda on this issue without quantifiable information.

The Faculty is equally as concerned as the reviewers with the student interest in the program and continue to work with the program leaders on this issue by participating on a Nuclear advisory board to understand why the industry has pulled back on sending students to the program. At the moment this appears to be a financial issue, but the Faculty has been told by the industry leaders that this program is still heavily supported. They continue to remain invested in supporting the nuclear industry, and will help the program to remain successful. A refresh of the program pedagogical delivery may help but they understand from students and industry leaders, the main issue is that the companies have been less inclined to share tuition costs with their employees recently.

Quality Assurance Committee Recommendation

McMaster's Quality Assurance Committee (QAC) reviewed the above documentation and the committee recommends that the program should follow the regular course of action with a progress report and subsequent full external cyclical review to be conducted no later than 8 years after the start of the last review.

FINAL ASSESSMENT REPORT

Institutional Quality Assurance Program (IQAP) Review

Water Without Borders, G.Dip

Date of Review: March 20th and 21st, 2019

In accordance with the University Institutional Quality Assurance Process (IQAP), this final assessment report provides a synthesis of the external evaluation and the internal response and assessments of the Water Without Borders Graduate Diploma. This report identifies the significant strengths of the program, together with opportunities for program improvement and enhancement, and it sets out and prioritizes the recommendations that have been selected for implementation.

The report includes an Implementation Plan that identifies who will be responsible for approving the recommendations set out in the Final Assessment Report; who will be responsible for providing any resources entailed by those recommendations; any changes in organization, policy or governance that will be necessary to meet the recommendations and who will be responsible for acting on those recommendations; and timelines for acting on and monitoring the implementation of those recommendations.

Executive Summary of the Review

In accordance with the Institutional Quality Assurance Process (IQAP), the Water Without Borders graduate diploma submitted a self-study in February 2019 to the Vice-Provost and Dean of Graduate Studies to initiate the cyclical program review of its diploma. The approved self-study presented program descriptions, learning outcomes, and analyses of data provided by the Office of Institutional Research and Analysis. Appendices to the self-study contained all course outlines associated with the program and the CVs for each full-time member in the department.

Two arm's length external reviewers and one internal reviewer were endorsed by the Dean, Faculty of Social Sciences, and selected by the Vice-Provost and Dean of Graduate Studies. The review team reviewed the self-study documentation and then conducted a site visit to McMaster University on March 20th and 21st 2019. The visit included interviews with the Provost and Vice-President (Academic); Vice-Provost and Dean of Graduate Studies, Associate Dean, Grad Studies and Research, Director of the diploma program and meetings with groups of current students, faculty and support staff.

The Director of the School and the Vice-Provost and Dean of Graduate Studies submitted responses to the Reviewers' Report (February 2020 and September 2020). Specific recommendations were discussed and clarifications and corrections were presented. Follow-up actions and timelines were included.

- ### Summary of the Reviewers' Recommendations with the Department's and Dean's Responses

	Recommendation	Proposed Follow-Up	Responsibility for Leading Follow-Up	Timeline for Addressing Recommendation
1	Integrate Course content of WOB 701, WOB 702, and WOB 703	Curriculum revision: centralize WOB 701 within WOB 703	Directors of WWB, at McMaster University & UNU - INWEH	1) In progress. Likely to be completed by April 30, 2020.
2	<p>1) Envision the WWB Program within the McMaster context more broadly.</p> <p>2) Consider enhancing the role of WOB 701 Field Course and of the status of WOB 703 Mini-Paper.</p>	<p>1) Conduct visioning consultation with: President, The Provost, The Director of UNU INWEH, the Faculty Deans and key sister units who could contribute to curriculum enrichment.</p> <p>2) centralize field experience in current course requirements for WOB 702 and position as central in curriculum revision review:</p> <p>1) experience of students.</p>	<p>Program Leads: WWB Program Director, McMaster University</p> <p>Co-Director: Water Without Borders Graduate Program, UNU INWEH</p>	<p>1) By March 31, (to start following completion of WWB 701 Peru Field Course)</p> <p>2) In progress: Draft Curriculum Proposal likely to be completed by May 15, 2020, to go to Graduate Council in June.</p>

		2) existing papers, and 3) views of participating students' home departments		
3	Nurture greater continuity of co-directors - place co-directors who will serve for the coming five years	1) 5-year appointment to N. Doubleday, effective July 1, 2019 2) N. Nagabhatla designated UNU – INWEH WWB Co-Director, effective July 1, 2019	Dean, SGSR, McMaster University Senate UNU – INWEH, Director, UNU Rector	1) Done, approved by Senate, January 2019 2) Done, approved by UNU Rector, May 2019.
4	Clarify roles and responsibilities of partner institutions	Revisit 2010 program approval agreement	Dean, Graduate Studies, McMaster University; Director, UNU - INWEH	Consult and draft renewed program agreement for wider discussion. Prepare draft by April 2020
5	Review implementation of roles and responsibilities of partner institutions	WWB Co-Directors will work with their respective institutional leads	Provost, McMaster University & Director, UNU-INWEH	WWB Co-directors will work with their respective institutional leads January 2020
6	Enhance program identity & visibility	Two-stage process: 1) internal profiling - this should be primary - the WWB program is only for McMaster students 2) external profiling - part of McMaster university profiling and branding e.g. contributing to SDG rankings	Director WWB, McMaster;	Done: 1) internal profiling successfully raised applications from 10 students to 51 students in June 2019 2) McMaster University ranked second in the world in the Times Higher Education Impact Ranking, for implementing SDGs (April 3, 2019). WWB would be an asset.

7	Address institutional home	Consult with respective partner institutions; faculty, students; Deans; & wider, "water community"	Provost, Council of Deans McMaster University	Link to the Visioning process in #20
8	Review program size considerations and identify limitations	WWB Co-Directors consult with their respective institutions & request necessary resources	WWB Co-Directors and Dean (SGSR)	Done in 2019-2020 Should continue Goal: annual process
9	Maintain an alumni database.	Maintain the existing database sheet	WWB Co-Directors, & Maintenance by student program staff	Started in September 2018, Continuous process.
10	Promote the success stories of alumni and launch PR activities to increase visibility	Establish websites at McMaster and UNU - INWEH to share alumni news	Communications Staff, McMaster & UNU - INWEH	Survey students annually. Last completed in 2018, repeat in October 2020.
11	Synchronize course content	Shared water vocabulary & and water knowledge foundations	WWB Co-Directors	On-going curriculum development Between September 2019 and March 2020
12	Identify additional guest lecturers	Consult with UNU - INWEH Director and staff; and McMaster Faculty	WWB Co-Directors	5 additional lecturers were identified. September 2019
13	Revisit schedule for WOB 703	Consult with UNU - INWEH Director and staff;	WWB Co-Directors	Completed in May 2019.
14	Identify "champions" in each faculty	Consult with Faculty Deans	WWB Director	March 31, 2020
15	Create an active and engaged advisory committee	Consult Faculty Deans, Designates and Graduate Council	WWB Co-Directors	Consult by March 31, 2020; announce in May 2020

16	Update description of the WWB's administrative structure, procedures	Prepare new handbook once program home & design decisions are final	WWB Director & SGSR	June 30, 2020
17	Secure an institutional home at McMaster University	given the on-going and emergent institutional negotiations at McMaster university around water in general, the needs of WWB should be considered as part of a central visioning of McMaster's water commitments	Provost and Council, Dean SGSR, VP Research & WWB Director	BY: January 2021 (to allow complete cycle of approvals, up to Senate & BOG)
18	Seek scholarships or other funding support to subsidize costs of field trips		Dean & Staff, SGSR; & WWB Co-Directors	Annually, with budget cycle
19	Encourage the co-directors to explore the possibility of expanding the program significantly	WWB Co-Directors consult with UNU – INWEH, Dean, SGSR & Provost to ascertain viability of increased student load, resources required and proposal to obtain required resources (Provost).	WWB Co-Directors consider preliminary expansion in short-term and seek resources for sustained growth in mid-, and long-term.	Done: August 2019. Expanded intake by 33% in 2019-2020, from 9 to 12 students. To do: Before June 1, 2020, structural issues of funding need to be addressed before further growth is possible.
20	Raise Profile: Develop McMaster branded TED talks on water-related issues; AND Make these TED talks available on the web, this would draw attention to the program.	Recommendation: 1) consider "profile" more broadly within the McMaster context 2) look into Brighter Worlds initiatives such as "Designing Paradise" to determine	Director, WWB in consultation with Dean SGSR, Provost	This is would seem to be more appropriately considered within an institution-wide analysis.

		possibilities for McMaster-wide water-focused programming.		
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4) Potential for growth, impact and excellence:

The visions for the potential for the program are proportional to the need for synergistic approaches to global water concerns and needs, present and future, across scales of human development and the needs of the biosphere. On a trial basis, the decision was taken by the program leads at UNU INWEH and McMaster, in consultation with the Dean of SGSR, that the number of students admitted would be increased to 12 students for 2019-2020 - a very modest number - but representing a 33% increase over the previous intakes, and without new resources beyond those previously drawn from SGSR.

This included an allocation for a 0.2 FTE for administrative support with student applications, recommended in the administrative review in 2016, and paid to the Institute on Globalization and the Human Conditions for the share of administrative time involved.

More importantly, McMaster received over 50 viable applications for admission from students, indicating the existence of a very real interest in, and demand for the Water Without Borders Program. Clearly the potential for growth exists. As can be expected, there will be needs for resources that will accompany any efforts that are to be made to realize this potential. For this reason, we recognize that budgetary issues must be considered urgently, and two possibilities are under consideration. First, that a modest fee (perhaps 1/3 of the regular graduate fee) be levied; and second that the intent and funding strategy of the original proposal for Water Without Borders from McMaster to the Ontario Council of Graduate Studies, be implemented. In the OCGS approved program documents, the funding expectation presented was that there would be faculty-level contributions, in the amount of \$1000 per student, times the number of students from a given faculty. (If we are to pursue this second strategy, in consideration of changing funding models, perhaps this could be pro-rated at 2/3 of the regular student fee). In any event, the budget model will want to reflect flows from any new fee arrangements that are negotiated.

In any event, in order to grow, and deliver international experiential learning, additional resources for faculty support are needed. An expanded program with multiple small cohorts would offer better quality experience, and safety considerations must remain paramount. Once the budget decisions are made, the viable alternatives among programming options will become clear.

The discussion of a budget model is a tangible shared concern and could function as an inducement to bring parties with relevant interests across the faculties into a common conversation about this interdisciplinary program. Once engaged, the discussion of governance could be considered: if the Faculty Deans are prepared to support this in alignment with the OCGS program approval, clearly there will need to a reporting structure to ensure accountability, transparency and alignment. One option, is to take the current reporting line to the Dean of Graduate Studies and to the Provost, and to strengthen

it with a requirement for an annual report to the Provost's Council. Undoubtedly other possibilities made be identified in the course of the "visioning exercise" recommended under Item 20 (above).

Response by Dr. Doug Welch, Vice-Provost and Dean of Graduate Studies

The (McMaster-side) Director of the Water Without Borders program reports to Dr. Welch – he acknowledged that this was a unique situation in the institution and one which also places him in potential conflict with his responsibilities for the overall quality assurance processes of graduate programs.

Dr. Welch noted he was very grateful to the reviewers for their careful assessment of the WWB program and the guidance for ways in which it may be improved, and its impact extended.

The nominal timeline for this report being completed was interrupted by the pandemic and so a few of the target dates are understandably somewhat behind at this point. Nonetheless, the challenges introduced by COVID-19 have also led to new opportunities as Dr. Welch would articulate. Furthermore, UNU-INWEH has just recently received notification that its funding has been extended by five years (until 2025) and they look forward to our continued positive partnership.

During the 2019-20 academic year, tuition for this additional credential was introduced and approved by the Board of Governors effective September 2020. The total tuition paid for the three courses is \$1050/student which provides a very significant contribution to the operating costs of the program and its financial sustainability. In addition, it provides a sound basis for funding future curriculum development.

The program Directors noted early on this year that it was likely that the field trip would not be possible during the 2020-2021 academic year due to travel restrictions. They responded by enhancing online offerings and allowing for a larger number of accepted applicants. At this writing there are very nearly 50 students who have accepted their offers and will participate in WWB this academic year.

The long-term financial model to sustain the program and the contributions of different Faculties is still to be fully established. Dr. Welch spoke with the new Provost, Dr. Susan Tighe, and noted that they are both keen on making these arrangements in the coming year. The disruption caused by COVID has prevented any real opportunity to make such progress in the interim.

Overall, Dr. welch was delighted to acknowledge how much the leadership of the Water Without Borders program has responded positively to the challenges and changes in circumstance that it has encountered and look forward to continuing to work with them to allow it to prosper. When field trips are again possible, it will be in a far stronger position to offer enhanced programming and bring more McMaster student's minds to concentrate on - and contribute to - the water security challenges of our world.

Quality Assurance Committee Recommendation

McMaster's Quality Assurance Committee (QAC) reviewed the above documentation and the committee recommends that the program should follow the regular course of action with a progress report and subsequent full external cyclical review to be conducted no later than 8 years after the start of the last review.