Western University

Scholarship@Western

The Organizational Improvement Plan at Western University

Education Faculty

8-9-2021

Fostering Collaboration Between local HEIs and Global Professional Engineering Organization

Helder F. Pinheiro Mr
Western University, hpinheir@uwo.ca

Follow this and additional works at: https://ir.lib.uwo.ca/oip

 Part of the Educational Leadership Commons, and the Higher Education Commons

Recommended Citation

Pinheiro, H. F. (2021). Fostering Collaboration Between local HEIs and Global Professional Engineering Organization. *The Organizational Improvement Plan at Western University, 201*. Retrieved from https://ir.lib.uwo.ca/oip/201

This OIP is brought to you for free and open access by the Education Faculty at Scholarship@Western. It has been accepted for inclusion in The Organizational Improvement Plan at Western University by an authorized administrator of Scholarship@Western. For more information, please contact wlswadmin@uwo.ca.

Abstract

This organizational improvement plan (OIP) proposes a change process to foster collaboration between a not-for-profit engineering organization and higher education institutions (HEIs) situated in the Central Ontario Region. This OIP will help students create successful conditions to transition from HEIs to workplaces by providing them with support from a multidisciplinary team, including professional engineers. Support will be needed to engage students in events that underscore creativity, critical thinking, communication, and other leadership competencies for facing 21st-century challenges. As a section chair, I will work as a change initiator/participant with a guiding coalition encompassing students, faculty members, HEI administrators, and executives from the engineering organization to create a sustainable change solution. This OIP is viewed from the interpretivist paradigm that informs the use of the principles of adaptive, humble, and distributive leadership approaches. The leadership framework drives the implementation plan, which focuses on developing a student-run society that will create and promote activities to help students transition from HEIs to workplaces. The solution presented offers a way of ensuring financial support and management methods to increase stakeholder accountability and engagement. Lessons learned from the change process will be shared with engineering associations and HEIs across Canada. The report demonstrates how the implementation plan and the adopted change model and leadership approaches are woven into monitoring and evaluation methods grounded on a continuous and open communication system. This OIP may be adapted to similar contexts in which chapters of professional associations and engineering schools have the common goal of enhancing student engagement with the local community.

Keywords: not-for-profit engineering organization, higher education institutions, engineering schools, student society, collaboration, leadership approaches.

Executive Summary

Higher education institutions (HEIs) and professional organizations worldwide are being called upon to bridge the gap between educational institutions and workplaces to enable students to keep pace with the fast-changing work environment (Van Laar et al., 2020; Vista, 2020). The current global pandemic has accelerated the need for providing engineering students with the skills to thrive in the rapidly changing world. Thus, it is crucial that engineering schools establish partnerships in their communities that enable students or recent graduates to acquire the necessary skills to face the unpredictable industrial landscape of the future.

The purpose of this organizational improvement plan (OIP) is to engage a not-for-profit engineering organization and HEIs situated in the Central Ontario Region in a collaborative process. The primary goal of the engagement is to provide students with opportunities to participate in extracurricular activities promoted by the engineering organization that help them develop the engineering skills that are critical for the transition from HEIs and workplaces. In this OIP, I will refer to engineering skills as a combination of technical skills with competences in high demand by employers: creativity, critical thinking, communication, collaboration (Fullan et al., 2018).

A brief context and history of the Global Engineering Organization (GEO; a pseudonym) are presented in Chapter 1 to explain its evolution and engagement with the local community. I discuss my leadership position and lens that resonates with interpretivism, the distributed leadership framework (Spillane, 2006) and the adaptive leadership method (Heifetz et al., 2009). The problem of practice addressed is the lack of collaboration between HEIs and a geographic region of GEO, the GEO Section. This OIP seeks alternatives to empower leaders from the GEO Section and HEIs to develop a psychologically safe environment that accommodates their multiple perspectives and bridge the gap between HEIs and the GEO Section. Multiple driving and restraining forces that shape the problem of practice are identified using the political, economic, social, and technological (PEST) analysis (Deszca et al., 2020). To

form my leadership-focused vision for change, I identify the gap between the present and the desired stages. The internal and external change drivers from the GEO Section and local HEIs are identified. Finally, the organizational readiness is analyzed considering the internal and external forces identified in the PEST analysis. The readiness-for-change questionnaire (Deszca et al., 2020) is used to determine how ready the GEO Section is for change and inform possible solutions for change presented in Chapter 2.

In Chapter 2, the adaptive, distributed, and humble leadership approaches are analyzed and selected. The leadership approaches will engage and empower the change agents to move this OIP forward, considering that stakeholders represent various perspectives and experiences. Schein's change model (Schein, 2013; Schein & Schein, 2017), congruent with the leadership approaches and interpretive paradigm, is selected. The change model considers the GEO Section and HEIs as a complex result of the interaction between human beings and the environment in each situation. As such, Schein's change model will enact the change initiative to develop a supportive and psychologically safe environment where collaboration between HEIs and the GEO Section can occur. Nadler and Tushman's (1980) congruence model is adopted to conduct the GEO Section gap analysis, considering the internal and external forces determined by the PEST analysis in Chapter 1. Three workable solutions for change are examined, and the chosen solution for this OIP focuses on creating a student-run society (Vander Pyl et al., 2016). The chosen solution is further examined using the iterative plan, do, study, act (PDSA) method (Christoff, 2018). Lastly, ethical considerations establish that the GEO Section is responsible for ensuring that the stakeholders and change agents possess the moral principles of honesty, care, and professionalism.

Chapter 3 outlines a plan for implementation, monitoring, evaluation, and communication of this OIP. The short-, medium-, and long-term goals of the plan are presented. The plan is interwoven throughout Schein's change model (Schein & Schein, 2017). The OIP also encompasses transition management to assess stakeholders' reactions, identify resistors and

adopters, and determine the necessary support and resources to enact this change initiative. The importance of a guiding coalition to develop a prosperous student society is emphasized. The PDSA model is used as a framework to establish a monitoring and evaluation process with multiple strategies and tactics based on the mixed-method approach, including humble inquiry (Schein, 2013) and the balanced scorecard method (Kaplan & Norton, 2006). The monitoring and evaluation process will provide a more holistic view of the problem of practice by using several methods for interpreting the measurements and perspectives of stakeholders qualitatively (Creswell, 2014; Mertens & Wilson, 2012). In resonance with the interpretivist paradigm, the OIP will consider the interpretation of multiple values and perspectives of stakeholders using qualitative methods, including semistructured interviews (Schein, 2013; Schwandt, 2008), meetings, observations, and a balanced scorecard approach with some variables associated with social interaction among stakeholders (Kao et al., 2017; Kaplan, 1996; Olden & Smith, 2008).

To conclude, this OIP articulates the following steps and future considerations for deepening the engagement of the student run-society with the local community. The next steps include the consolidation and maintenance of the climate of collaboration between HEIs and the GEO Section, creating a student society to encourage women to develop leadership skills and helping international students to engage with GEO and the local community. The future consideration will further propel this OIP to provide students with safety psychology for their transition from HEIs to workplaces with the support of a multidisciplinary team including professional engineers.

Acknowledgements

I dedicate this organizational improvement project to my family: my wife, Jian, my son, Henry, and my daughter, Helen. I would never have achieved this milestone without their unconditional support throughout the process.

I would like to thank my fellow members of the Community Leadership cohort for encouraging and inspiring me to be better, and the professors in the Faculty of Education at Western University, Dr. Cheryl Bauman-Buffone, Dr. John Scott Lowrey, Dr. Marybeth Fortune, Dr. Rita A. Gardiner, Dr. Tania Kajner, and Dr. Terry Burwell for the lessons about education, organization change and leadership, and for their helpful feedback.

I owe a debt of gratitude to Dr. Peter Edwards for being my advisor. I was privileged and honoured to have his guidance and support. He has inspired me to achieve at a level higher than I thought would be possible.

Finally, I would like to extend my sincere thanks to the anonymous examiners for the enlightenment that allowed me to probe deeper for ways to improve my thinking about organizational change .

Table of Contents

List of Tables

List of Figures

List of Acronyms

AG (Affinity Group)

AGM (Annual General Meeting)

AL (Adaptive Leadership)

BSC (Balanced Scorecard Card)

COC (Central Ontario College)

COVID-19 (Coronavirus Disease 2019)

CPM (Change Path Model)

CT (Communication Team)

DL (Distributed Leadership)

GC (Guiding Coalition)

GEO (Global Engineering Organization)

GEOSS (Global Engineering Organization Student Society)

GU (Geographic Unit)

KPIs (Key Performance Indicators)

HEI (Higher Educational Institution)

HL (Humble Leadership)

OACETT (Ontario Association of Certified Engineering Technicians and Technologists)

OIP (Organization Improvement Plan)

OMCU (Ministry of Colleges and Universities)

ORJI (Observation, Reaction, Intervention, and Judgment)

OSPE (Ontario Society of Professional Engineers)

PBL (Problem-Based Learning)

PDSA (Plan, Do, Study, Act)

PEO (Professional Engineers Ontario)

PEST (Political, Economic, Social, and Technological

PESTEL (Political, Economic, Social, Technological, Environmental, and Legal)

PoP (Problem of Practice)

STEM (Study Science, Technology, Engineering, and Mathematics)

TAU (Technical Activities Unit)

Definitions

Adaptive Capacity: "The resilience of people and the capacity of systems to engage in problem-defining and problem-solving work in the midst of adaptive pressures and resulting disequilibrium" (Heifetz et al., 2009, p. 303).

Adaptive Challenge: "The gap between the values people stand (that constitute thriving) and the reality that they face (their current lack of capacity to realize those values in their environment)" (Heifetz et al., 2009, p. 303).

Dance Floor: "Where the action is. Where the friction, noise, tension, and systemic activity are occurring. Ultimately, the place where the work gets done" (Heifetz et al., 2009, p. 304).

Dread Risk: "Aspects of a risk that make us anxious as we contemplate its potential realization" (Koenig, 2018, p. 219).

Get on the Balcony: "Taking a distanced view. The mental act of disengaging *from dance floor,* the current swirl of activity, in order to observe and gain perspective on yourself and on the large system" (Heifetz et al., 2009, p. 305).

Organizational Improvement Plan (OIP): "A major persuasive research paper that provides evidence-based pathways to address organizational problems, and more broadly, serve the public and/or social good. It is a practical yet theory and research-informed plan that aims to address and find solutions for a particular problem of practice through leading meaning change to salient problems of practice within in the organization" (Western University, 2015, p. 1).

Problem of Practice (PoP): A situation that exists in one's place of work that revolves around a specific workplace problem when values/goals are not entirely met (Pollock, 2013).

Song Beneath the Words: "The underlying meaning or unspoken subtext in someone's comment, often identified by body language, tone, intensity of voice, and the choice of language" (Heifetz et al., 2009, p. 307).

Chapter 1: Introduction and Problem

Despite having several professional engineering organizations in Canada, including the Professional Engineers Ontario (PEO, n.d.), the Ontario Association of Certified Engineering Technicians and Technologists (OACETT, n.d.), and the Ontario Society of Professional Engineers (OSPE, n.d.), the collaboration and engagement between higher educational institutions (HEIs) and professional organizations are not always strong within local communities. Here, I define collaboration as the process that "involves linking, leveraging, and aligning resources in ways that enhance one another's capacity to create a shared outcome, a mutual benefit"(Morrison et al., 2019, p. 19).

Fortunately, professional engineering organizations and associations can help students bridge the gap between schools and workplaces. This *organizational improvement plan* (OIP) focuses on fostering the collaboration between local HEIs and a section of an engineering professional organization. More specifically, this OIP describes how a local section of a global engineering organization can foster its collaboration with HEIs, especially engineering schools, to facilitate students' transition from engineering schools to workplaces within the local community.

This chapter begins by highlighting the organizational context, including a historical overview of the organization that shows its evolution from its foundation to the point that illuminates the organizational *problem of practice* (PoP). Subsequently, the PoP is unfolded, analyzed, and framed considering the contextual constraints. A critical analysis of the internal and external factors leads to guiding questions emerging from the PoP. This chapter also presents a leadership vision for change, underlining the gap between the present and the desired state. The chapter concludes with an assessment of the organization's readiness for change and discusses the findings that inform Chapter 2 that seeks possible solutions to address the PoP.

Organizational Context

My organization is a small-sized section of the Global Engineering Organization (GEO) (a pseudonym) situated in Central Ontario. GEO is a not-for-profit organization with a mission to advance technology for the benefit of humanity. GEO's vision is rooted in developing a global technical community that stresses collaboration, professionalism, and community building to promote innovative technical ideas and to foster new technology. The mission and vision explain why GEO acts to create standards for a broad range of industries to refine and disseminate quality technical information essential to the global technical community. GEO also supports student programs, advances technology for the benefit of humanity, and develops codes of ethics for new technologies, including autonomous vehicles and artificial intelligence. In addition, the organization aligns its resources with priorities following principles of inclusion and equity (GEO Staff Member, personal communication, March 10, 2020).

However, the GEO's beginning goes back to the mid-1960s when two American engineering institutes amalgamated. Since then, GEO was designed to serve professionals involved in the electrical engineering field. GEO also excels in organizing conferences and educational activities, publishing top-cited periodicals. In addition, GEO manages several boards to develop technical documents, especially standards applied to wireless communications and power systems. As a result, GEO has become one of the best-known global professional organizations spanning academia and industry. GEO has spread across the world, reaching more than 160 countries in just a few decades. To follow the shape-shifting technological world, GEO has expanded to many technical fields, including cybersecurity, nanotechnology, smart grids, the Internet of things, and artificial intelligence. The quick expansion of the organization has also affected membership. The organization's scope has become so vast that it has attracted people in other fields, including students, educators, computer scientists, software developers, information technology professionals, physicists,

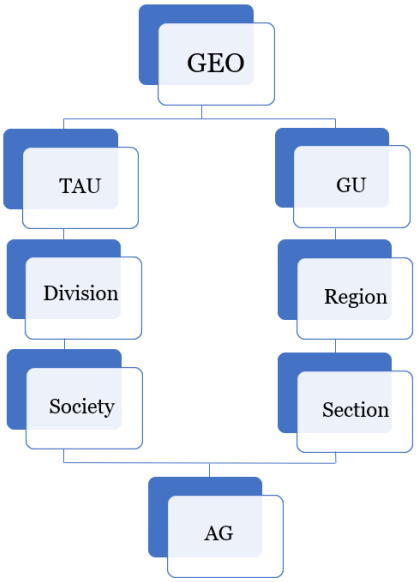
mathematicians, and entrepreneurs. This diversity has provided GEO with multiple perspectives and has created a sound decision-making process to build its annual action plans.

GEO is staffed with volunteers, and formal leaders are elected or appointed to positions of power by members. GEO is a complex community system with two intertwined structures: technical activities units (TAUs) and geographic units (GUs), as depicted in Figure 1. The TAU structure is divided into divisions and societies. TAU aims to keep members current by providing them with cutting-edge technical periodicals, conferences, the ability to network with professionals locally and abroad, access to humanitarian projects, and opportunities to collaborate on research with leading experts.

The GU structure is composed of regions that are divided into local geographic organizational units known as sections. Canada is one of the regions with more than 4% of the total members and has more than 20 sections. The sections are essential because they are in direct contact with local communities.

Figure 1

Partial Organizational Chart of the Global Engineering Organization



Note. AG = Affinity Group; GEO = Global Engineering Organization; GU = Geographic Unit; TAU = Technical Activities Unit.

Adapted from *GEO Annual Report* by GEO, 2021.

As shown in Figure 1, the affinity group (AG) connects the society with the section. AG is a group of members working in a GEO designated field, including computer science, mathematics, education, medical science, and management.

GEO Section

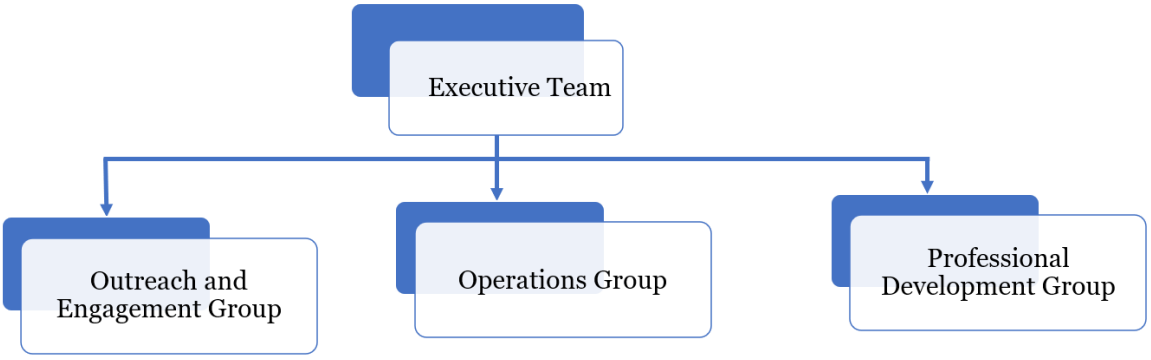
The GEO Section was founded in the early 1980s by a dynamic group of engineers and research scientists passionate about developing new technologies. At that time, over 80% of the members worked in Central Ontario's industrial landscape that comprised large multinational companies, especially in power engineering. Gradually, the GEO Section started creating ties with other professional associations' chapters, organizing local symposiums and social events for members.

The GEO Section adopts a flat hierarchy or a structure with no management levels between other volunteers and me. The GEO Section can be viewed as a microcosm of the local community. The GEO Section comprises members with diverse cultural and professional backgrounds, including educators, engineers, technologists, researchers, students, and physicists. Therefore, the members are from different sectors: academia, government, and industry. However, the majority of the GEO Section members are either employed directly by industry or indirectly supporting industry in many ways.

The GEO Section has an executive team divided into three groups: Outreach and Engagement, Operations, and Professional Development (see Figure 2). The Outreach and Engagement Group conducts joint meetings and events with local engineering chapters, establishes partnership with the local industries, and actively recruits volunteers. The Operations Group plans the annual budget for local activities, updates section website and social media platforms, reviews meetings and activities reports, and engages senior members in leadership roles. Finally, the Professional Development Group conducts continuing education activities for members and engages with industry professionals.

Figure 2

Partial Organizational Chart of the GEO Section



The GEO Section's executive team comprises senior engineers who are lifelong learners with the impressive intellectual curiosity to follow leading-edge technologies and realize the full depth and breadth of GEO. Despite GEO's commitment to equity and inclusion, the executive team is predominantly male and reflects the fact that the majority of the members are men. However, the GEO Section has been promoting and sponsoring local events that encourage young women to study science, technology, engineering, and mathematics (STEM). The GEO Section executives have joined the organization for several reasons, including the desire to remain technically current, network with others in the profession, and participate in local activities. Additionally, the team is cohesive, and its culture encompasses trust, collaboration, and an ethical decision-making process that emerges from reflections based on moral and ethical values that stress responsibility and care to the local community (Andrews et al., 2019). With no cooperation, no community, and no conversation, there is no trust (Solomon, 2014). Consequently, the executive team has been instrumental in organizing technical gatherings to refine and issue quality technical information, network, and collaborate. Every year, the GEO Section organizes and promotes an engineering challenge, a regional science fair and a hackathon for secondary students, and an engineering symposium, an innovation technology showcase, technical visits, and seminars for senior engineers. All these events keep the GEO Section involved with the local community and ensure the

organization's diversified portfolio, which reduces risks in the sense that if an event fails, it does not compromise the GEO Section in terms of budget and human resources (Koenig, 2018).

The GEO Section has also high relevance because of its sponsorships from local institutions and interactions with professional associations. The section works in partnership with local chapters of professional associations, including the PEO (n.d.), the OACETT (n.d.), and the OSPE (n.d.). The collaboration with local professional associations makes the GEO Section continually active, visible on technology trends, and open to a distributed leadership paradigm in which leaders of different organizations interact to promote events for the local engineering community.

Thanks to the support and collaboration from the local community, even though the GEO Section is small, it manages to delegate leadership responsibilities to a network of multidisciplinary teams of volunteers who have strong achievement orientation and address their desire to implement goals to feel satisfied with their volunteer experience. The GEO Section has a strong collaborative culture, and it has been named one of Canada's most active and progressive sections by a committee representing the Global GEO. The section was recognized as a leader in membership retention and invited to deliver an online presentation about its collaborative culture to all world sections.

Despite the executive team's success, restraining forces may disrupt the section's ability to deliver on its mission. Most of the members come from an industrial landscape diminished due to the closing of prominent manufacturers in Central Ontario. There is also a lack of members in leadership roles, especially industry relation officers, who are essential individuals to strengthen the ties between the section and the local industry. As a result, the status quo creates excessive workload or extensive backlogs (deferred work) due to the lack of members from the industry in leadership roles. There are also driving forces that can promote changes. For example, most new members are students from HEIs interested in the GEO mentorship programs and faculty members looking forward to fostering their institutions' engagement within the local community. Faculty members and academic administrators from local HEIs, including deans and chairs, have

engaged in discussions around the importance of fostering extracurricular activities to engage students with the local community including engineering professional associations and organizations. These discussions have converged toward a recommendation of GEO headquarters, underlining that the sections should strive to create opportunities for collaboration to engage students from HEIs and young professionals in the mission of developing local partnerships to foster continued improvement (Grossman, 2012; Hinkle & Koretsky, 2019).

In summary, I presented the organization's mission and vision that correlate with the advancement of technology for the benefit of humanity. I also introduced the organizational structure and its evolution from the foundation to the present time in which GEO has established itself as one of the best-known global professional organizations. In this OIP, I use leadership approaches that are part of my worldview and correlate those with the context of the problem to be addressed. In the following section, I will discuss my leadership lens and worldview that will help me lead the GEO Section through changes.

Leadership Position and Lens Statement

The GEO Section's executive team comprises the chair, vice-chair, secretary, webmaster, and treasurer. All positions are fulfilled through a voting process that occurs in the annual general meeting (AGM). As the change leader, I hold the chair position of the GEO Section. Past experiences as a vice-chair and informal roles focused on engineering symposiums, and technical visits inform my intimate understanding of the existing GEO organizational structure and the GEO board of governors composed of all section chairs and led by the president of the GEO for Canada.

As a chair, I ensure that local members' best interests are met and provide leadership and guidance to the executive team to increase member engagement and satisfaction. Additionally, I am a voting member of the GEO National Board, at which section chairs of all regions of Canada convene to comment on membership trends, discuss solutions for current problems, share their best success stories, and propose ideas for the annual GEO national plan.

Leadership Engagement and Power

I have engaged in leadership roles to bolster the GEO Section's ties with local institutions, especially industries and local chapters of engineering associations, such as PEO and OACETT. I am part of the volunteer-led environment where technical thought leaders from the local community converge to create an executive group to organize and promote activities to the members and the general public living in Central Ontario.

My combined industrial and academic background have allowed me to start serving the organization as an informal leader and act as an industrial relations officer. My role was to work closely with industry and academia to promote seminars, arrange technical visits for GEO members and professionals from PEO and OACETT, organize networking events, and connect potential members with the GEO resources.

The importance of the work as an informal leader was threefold. First, it provided me with essential information about the local industrial landscape. On one side, I could see disappearing industries, including traditional large manufacturers of electrical motors and generators. On the other hand, despite the industrial landscape woes, I could identify new stakeholders, especially HEIs that have expanded their programs and attracted hundreds of students and a new wave of business that has been shaped by innovative minds with a strong commitment to sustainability and cleantech businesses. Second, my informal leadership experience allowed me to bridge gaps and enhance relationships among the GEO Section, local chamber of commerce, the municipal economic development centre, the innovation cluster, local industries, and chapters of professional engineering associations. Third, I had the chance to reflect on my worldview (Creswell, 2014; Mack, 2010; Pham, 2018) and understand the importance of considering multiple perspectives rather than a single truth that a measurement process can determine. In addition, I developed my leadership philosophy considering leadership as a process that encompasses influence, collaboration, and shared goals (Northouse, 2019).

The immediate advantage of becoming a section chair was to deepen my understanding of the GEO organization's leadership style and compare it with my leadership approach. I operate with limited authority and lead a team of executives who hold leadership positions in their professional capacities and may not see themselves as followers (Catano et al., 2001; Jäger et al., 2009; Pearce, 1982; Posner, 2015; Rowold & Rohmann, 2009). The GEO Section is staffed by volunteers who do not receive financial compensation for their services. As in the transformational leadership model (Burns, 2011), I lead by emphasizing the importance of high-quality relationships and enabling volunteers who possess strong achievement orientation, address their desire to accomplish tasks and goals and feel satisfied with their volunteer experience. In addition, I encourage the executives of GEO Sections to serve the public interest first and the members second, following the tenets of servant leadership (Greenleaf, 1997; Northouse, 2018).

Leadership Philosophy

My leadership philosophy is not a static statement. It has evolved and guided me to a new challenge. The executive team of the GEO Section appointed me as a chair for Central Ontario. As a result, I was taking a formal leadership position at the GEO Section for the first time. The shift to a formal leadership position does not negate the importance of my informal leadership experience. Gamwell and Daly (2019) noted, "Informal leaders are the heart and soul of an organization" (p. 66). Thanks to my informal leadership experience, I understand the power of informal leadership style in fostering a culture of belonging in which members feel calm, safe, and comfortable to express their opinions. My informal leadership style helped me create bonds with all critical stakeholders and increase the executive team's accountability in promoting events to benefit the local engineering community.

My leadership in practice resonates with a collaborative and distributed leadership style (Kladifko, 2013; Spillane, 2006). I add values to my organization by delegating power to others

and focusing on the mitigation of obstacles and action plans to bolster the relationship between the organization and the local community.

Thanks to my experience as a section chair, my leadership approach has evolved into a style that stresses open communication and trusting relationships. This style accelerates the decision-making processes by fostering team-oriented behaviours, such as collaboration, information sharing, and community engagement. Furthermore, this leadership approach promotes equity and inclusion, creates psychological safety for all members, and maximizes organizational response to environmental stimuli by removing boundaries between formal and informal leaders.

I split my assumptions about leadership into two principles. First, human behaviour is complex (Schein, 1980, 2015). Second, significant changes are evolutionary (Heifetz et al., 2009). Therefore, the organization should have a flexible and customized leadership approach to cope with unpredictable human behaviour, uncontrollable environmental circumstances, and situations in which people of multiple backgrounds have different perspectives toward the same event. Given that organizations are complex social systems, there are no simple generalizations to explain how human beings interact (Schein, 1980). However, developing a customized leadership approach as I reflect on the existing leadership theories is possible.

Considering that the organization is not static, I strive to turn crises such as the coronavirus disease 2019 (COVID-19) pandemic into opportunities (Song & Zhou, 2020). An organization changes and evolves in response to internal and external restraining and driving forces that are well framed by contingency theories. Changes come from an agile process that is incremental and iterative (Burke, 2018). Thus, an organization's response is not linear. According to Heifetz et al. (2009), a slight change in an organization, like in a DNA molecule, can produce an expressive and positive outcome. This agile approach can allow unparalleled flexibility for the GEO Section to implement this OIP. My lens has also evolved regarding collaborative approaches. In my view, the distributed leadership framework makes leaders more

visible and quickly challenged. If leaders are not challenged, they may not even realize that sometimes they are aligned with incorrect actions. Consequently, they can create space for destructive leader behaviours or destructive leadership (Schyns & Schilling, 2013). Following my leadership lens, challenging leaders can help my OIP to prevent volunteers in leadership roles from slipping into traps associated with integrity or ethical issues.

More recently, I have delved into leadership theories and realize that my leadership lens resonates with adaptive leadership (Arthur-Mensah & Zimmerman, 2017; DeRue, 2011; Uhl-Bien et al., 2007) and humble leadership (Schein & Schein, 2018). These leadership methods can help develop my OIP that encompasses multiple stakeholders, including schools and local chapters of professional associations. These leadership methods can coexist into a framework based on distributed leadership (Harris, 2013; Lumby, 2013, 2019; Spillane, 2006).

Interpretivism

While organizations are often concerned with numbers, objectivity, facts, concreteness, and accountability, they are also saturated with subjectivity. From the social and subjective world comes the interpretivism paradigm (Creswell, 2014; Crotty, 2014; Hatch & Yanow, 2003; Mertens, 2010). According to Denzin (1989), interpretivism focuses on how mental and interactive states such as emotion, intention, and feelings are organized and experimented with by interacting individuals. Schein (1980) highlighted that an organization is a subjective, complex dynamic social system continually evolving in response to internal and external forces, similar to a living organism.

Consequently, there is no one simple answer, no one correct way to manage people, no perfect way to organize (Gallos, 2006; Schneider & Barbera, 2014). Using my worldview, I consider organizations as merely cognitive constructions that exist only in people's minds. My organization is a system of embedded cultures with people of multiple occupational and linguistic backgrounds. I also consider the GEO Section like a microcosm of the community that is a complex result of people's interactions. Unlike most engineering or technical decisions, the

decision-making approaches of executives of the GEO Section are not formulaic; rather, decisions are made based upon their experiences, cultural norms, and shared knowledge. In addition, my interpretivist lens considers that an organization has a sophisticated culture that is not easily controlled, coerced, and manipulated (Mack, 2010; Pham, 2018; Ryan, 2018).

I believe my OIP is best viewed via the interpretivist lens (Mack, 2010). It resonates with my worldview that considers the importance of multiple interpretations or perspectives to understand the complex human relationships inherent to this OIP. The GEO Section and its stakeholders constitute an environment with people of different backgrounds. The gap between the GEO Section and local HEIs is a problem requiring an approach to understand the issues associated with the different perspectives of stakeholders, especially students, faculty members, HEI administrators (e.g., deans and chairs), and the GEO Executive team regarding ways to trigger a collaboration process between GEO and local HEIs. Mack (2010) noted the interpretivist approach strives to understand the problem instead of explaining it. Consequently, I use the interpretivist to inform the proper leadership approaches to bring to light the different perspectives of stakeholders on my PoP.

As indicated in the previous section, my leadership lens resonates with adaptive leadership (Heifetz & Linsky, 2002), distributed leadership (Spillane, 2006), and humble leadership (Schein & Schein, 2018). The leadership approaches that are discussed in Chapter 2 have several aspects in common with the interpretivist approach. Like adaptive leadership (Heifetz & Linsky, 2002), interpretivism analyzes multiple change processes and determines their likelihoods for success (Mack, 2010). Interpretivism, like distributed leadership, strives to build networked communities and interpret actions considering multiple perspectives when creating change (Mack, 2010). Finally, interpretivism, like humble leadership (Schein & Schein, 2018), encourages leaders to truly understand individuals from within (Patton, 2015), avoids the bias in studying the events and people, and strives to understand an event deeply within its complexity by enhancing the communication considering the point of view of each person.

Consequently, my interpretivist lens reflects the theoretical framework applied in this OIP (Mack, 2010; Pham, 2018; Ryan, 2018; Schwandt, 2000). Leading change via the interpretivist perspective and the adaptive, distributed, and humble leadership approaches will serve the GEO executive team, students, and faculty members well. Furthermore, these approaches resonate with my worldview that considers the importance of understanding a social setting from the stakeholders' perspective via open communication, transparency, collaboration, and trust among everyone involved in a change initiative to enact solutions addressing the PoP.

My Vision

My theoretical and experiential learning of leadership combined with my interpretivist worldview are pillars for the vision I have crafted for the GEO Section. My vision is that the GEO Section will stimulate open and honest communication, be essential to the local community, and be recognized for bridging the gap between schools and the local community. Additionally, the GEO Section will conceptualize, plan, organize, and develop engineering activities for students from HEIs and young professionals that are aligned with engineering competences, including teamwork, professional responsibility, ethical behaviour, creativity, critical thinking, and understanding of the impact of engineering activities on the community (Andrews et al., 2019). With the support from the GEO Section executives and stakeholders from schools, my OIP will be not only a call for the need to promote new activities to enhance and grow the GEO Section, but also an initiative to forge productive collaboration between the GEO Section and HEIs considering student and faculty members' perspectives. The consideration of multiple perspectives will leverage equitable access to resources and commitment to the development of opportunities for all stakeholders irrespective of their occupations or cultural backgrounds.

In summary, I highlighted my formal leadership position as a chair section and my previous informal leadership roles that contributed to developing my leadership lens based on collaboration, power distribution, and open communication. I also presented my reflections from my combined leadership experience with leadership theory studies, which helped me to

devise a leadership framework. Finally, I highlighted my vision based on the interpretivism that considers an organization as an environment in which unpredictable human behaviour and uncontrollable circumstances coexist. In the next section, I will use my leadership lens integrated with the interpretivism paradigm and define the PoP at the GEO Section.

Leadership Problem of Practice

The PoP that will be addressed is the lack of collaboration between the GEO Section and HEIs, especially the schools of engineering (colleges and universities) in the region of Central Ontario, Canada. Although the GEO Section has several students and faculty members from local HEIs enrolled as GEO members, the current events supported by the GEO Section are designed and customized for students attending secondary schools (high schools) and senior engineers (mostly retired engineers). Currently, there are no events or efforts connecting the GEO Section executive team, faculty members and students from HEIs. A professional organization can provide faculty members and students with a rich source of information about various engineering topics and opportunities to remain current on standards as well as cutting-edge technologies (Hinkle & Koretsky, 2019; Mata et al., 2010; Pericles, 2020). Based on a literature review, student engagement with professional organization has positive impact on the student academic performance and future professional life (Blankenbuehler & Van Ness, 2018; Cooper et al., 2018; Grossman, 2012; National Society of Professional Engineers, n.d.; Watzky, 2018; Wright & Keirstead, 2018). The GEO Section encompasses engineers, educators, experts, managers, and practitioners from the local community, who can develop events to bridge the gap between HEIs and the GEO Section. Moreover, the GEO Section has developed ties with local chapters of professional engineering associations of paramount importance to promote initiatives to bridge the gap between the GEO Section and HEIs.

Recently, the GEO headquarters in the USA has stressed the importance of enacting activities to foster collaboration between HEIs and sections (GEO Staff Member, personal communication, September 20, 2020) to overcome the crisis in student membership due to the

COVID-19 pandemic (Harris & Jones, 2020). Furthermore, the GEO Canadian foundation provides colleges and universities across Canada with funding sources for attending GEO conferences, publishing papers, organizing social networking events, and developing local educational activities for the benefit of students and young professionals. Nevertheless, GEO's governance rules stress that only sections within a proven collaboration process with HEIs are eligible for receiving resources from the foundation and most of the awards, scholarships, and grants from GEO Headquarters for developing educational activities. Consequently, as the session chair, I conclude that significant opportunities have been missed due to the lack of collaboration between the GEO Section and HEIs.

There is currently no mechanism to address the disconnection between the GEO Section and HEIs because stakeholders, especially the GEO executives, students from HEIs, and faculty members, may consider the gap between the GEO Section and HEIs from multiple perspectives and interpret it differently (Mack, 2010; Pham, 2018). The understanding and the exploration of the different perspectives will be essential for planning actions to engage the GEO Section with students and faculty members through a process of collaboration centred on students and in resonance with the mission and goals of the GEO mentioned in Chapter 1.

Cooper et al. (2018) suggested every section of a professional organization is different even though common problems with sections exist. Each section is unique and has opportunities at its disposal if creativity, firm commitment and leadership are present. This OIP seeks alternatives to empower the GEO Section to enhance collaboration with local HEIs to provide students and faculty members with various opportunities to network with engineers and practitioners alike and access financial resources from GEO.

Framing the Problem of Practice

Heifetz and Linksy (2002) argued most organizational problems encompass technical and *adaptive challenges*. The technical challenge is a disequilibrium state that can be solved by the application of existing knowledge. The adaptive challenge is a problem that can only be

addressed by the process of learning new ways, engaging people, adjusting expectations, and even disrupting people, but at a rate, they can absorb (Heifetz et al., 2009).

My PoP is an adaptive challenge because it deals with the relationship between diverse stakeholders from the GEO Section and from HEIs and aims to encourage the stakeholders to invest time and efforts and take a proactive approach to create a sense of camaraderie and connect the GEO Section with HEIs. In this realm, bridging the gap between HEIs and the GEO Section can only be addressed through changes in stakeholders' priorities, behaviours, and beliefs (Heifetz et al., 2009; Schein & Schein, 2018). To determine the changes, I will consider multiple perspectives and experiences of students, faculty members, and the GEO Section executive board members regarding the disconnection between the GEO Section and HEIs. The perspectives will serve as opportunities for me to better understand the stakeholders' attitudes and feelings involved in a decision or affected by it. The understanding of stakeholders' perspectives will be essential for developing a collaborative process to select educational activities (e.g., engineering challenges, hackathons, and interdisciplinary webinars) that align with HEIs' and GEO's objectives and resonate with students' career goals and interests (American Chemical Society, n.d.-c; Buckwalter & Sweeney, 2020; Fultz & Smith, 2016).

In the following section, I discuss the political, economic, social, and technological (PEST) analysis approach employed in this OIP and analyze the impact of the lack of collaboration between HEIs and the GEO over each element of the PEST analysis.

PEST Analysis

The GEO Section cannot exist apart from the local community. The organization's success depends on partnerships built on trust and effective interpersonal communication with chapters of engineering associations and local HEIs. Within the context of this OIP, the analysis of internal and external aspects affecting the capacity for change is attained using PEST analysis that evaluates the political, economic, social, and technological aspects of an organization (Deszca et al., 2020). The political analysis examines government regulations, whereas the

economic aspect examines financial issues that may affect the organization. The social analysis assesses the human components that may affect the organization, and the technological aspect analysis evaluates the positive or negative impact of the organization's technology. There are other variants of PEST analysis, such as the political, economic, social, technological, environmental, and legal (PESTEL), that consider the environmental and legal aspects. These variants will not be considered because the environmental and legal factors are not significant and will not be directly addressed in this OIP. PEST analysis is imperative for an organization because it ensures that external and internal threats affecting its functioning are considered. Moreover, such analysis identifies the opportunities and the interconnectivity of internal and external factors that may play a key role in determining the right direction for the change initiative proposed by this OIP and making essential adaptive improvements for the organization. Additionally, this analysis determines if external or internal factors are driving or restraining forces (Deszca et al., 2020).

Politics

The first aspect of the PEST analysis, politics, examines the current vision, skills development recommendations, and intention of action plans for postsecondary education in Ontario. Recently, the Government of Ontario (2020) has launched an *Action Plan* to accelerate Ontario's recovery from the COVID-19 crisis. This plan seeks emerging technologies in engineering fields, in which GEO's focus is to ensure the real-time flow of data, particularly in relation to broadband and secure digital technology. These initiatives are driving forces because they resonate with the initiative proposed by this OIP and constitute opportunities for having a new partnership and reaching prospective members, including change leaders from HEIs. At present, the lack of collaboration between HEIs and the GEO Section prevents students and faculty members from accessing a network of GEO members, especially scientists, who can help students and faculty members to plan activities aligned with the Government of Ontario (2020) *Action Plan* to accelerate the recovery from the COVID-19 crisis (Maak et al., 2021).

Economics

The second aspect of the PEST analysis, economics, is of paramount importance because it provides a holistic vision of the actual financial situation for this OIP, including the local community and the challenging time due to the COVID-19 crisis (Song & Zhou, 2020). An assessment of the economic scenario enables the executive committee to maximize value creation based on risk-taking capacity and verify if the section has excellent financial control to ensure this OIP (Koenig, 2018). As previously noted, the GEO Section has kept a portfolio of activities with a broad scope. Every year, the section supports several engineering activities for the local secondary schools and senior engineers in partnership with PEO and OACETT. The diversified portfolio of activities constitutes a vital driving force for this OIP because it reduces risks by allocating risk-taking capacity to the various events and partners (Koenig, 2018).

As a not-for-profit organization, the GEO Section relies on its members, volunteers, and partners to cooperate and work together to move the organization and its activities forward. A key factor is reciprocity, in which the GEO Section and partners benefit by aligning and pooling resources so that there is no unnecessary duplication of resources. The collective leadership style will constitute a driving force of paramount importance to enacting events for bridging the gap between the GEO Section and HEIs.

Most of the revenue, over 90%, comes from the GEO headquarters as a rebate on an annual basis depending on the number of members, members' grades, the number of executive team meetings, and outreach activities. More than 30% of the total expenses support the most popular and well-attended event of the region: the engineering challenge, an activity in National Engineering Month (Engineers Canada, n.d.), that allows teams of secondary school students to design, construct, and test an engineering project, all within a few hours. Additional human and financial resources supporting these events come from the GEO Section and partners, including PEO, OACETT, OSPE, and local sponsors (i.e., industries and local government institutions). The section has supported an engineering symposium and an engineering challenge for

secondary students thanks to its adequate reserves and sound financial management that considers revenues available and anticipated and the uncertainties of planned income and expenditures. The short- and long-term strategic financial planning and management ensure the vitality that is a driving force for this OIP (Koenig, 2018).

For the GEO Section, the COVID-19 global crisis (Maak et al., 2021) has created a sound sense of commitment to prudence due to possible budget restrictions for the year 2021. Revenue uncertainties because of the COVID-19 pandemic crises (Maak et al., 2021) are a restraining force for developing this OIP. The problem can be mitigated by accessing financial sources (American Chemical Society, n.d.-b, n.d.-g) from GEO headquarters and the GEO Canadian foundation. The resources are available only for HEIs in collaboration with GEO through a local session. Currently, there are no shared educational activities between HEIs and the GEO Section. Consequently, the GEO Section and HEIs are missing resource opportunities for enacting important education activities such as field trips and challenges (Baldauff, 2016) Emory & Raymond, 2016; Wright & Keirstead, 2018).

Social

The third aspect of the PEST analysis, social, examines demographics and socioeconomic trends impacting the organization. The trend of losing members who work for manufacturing plants prevents strong ties with the industry and decreases social events that enable these members to network with professionals from the industry. Additionally, the trend makes it difficult to recruit volunteers for crucial leadership positions and has finally contributed to the slow increase or quasi stagnation of the number of members and volunteers. However, there is no *dread risk* (Koenig, 2018) because the industrial landscape change has also brought new opportunities, including cleantech businesses and small service businesses. The most promising change for the GEO Section regards the expansion of HEIs. They have been expanding existing programs and creating new ones, especially in trades and technology. Another crucial social impact is the massive presence of students. These students bring opportunities for regional

economic growth because of their consumption, work skills, entrepreneurial potential, and the fact that they enrich the local community's cultural diversity. Consequently, with the evolution of the local educational sector, the membership of HEIs has been gradually increasing and shedding light on the possibility of making students and faculty members develop educational activities (Curfman et al., 2018; Fultz & Smith, 2016; Swatling, 2016) in line with the strategic plans of HEIs and GEO. The increase of membership constitutes an important driving force for this OIP. However, to use this driving force, I need to establish a robust collaboration process between HEIs and the GEO Section using a clear leadership structure (Emory & Raymond, 2016).

Technology

Finally, the aspect of the PEST analysis, technology, examines technological resources available and their impacts. Technology is the main driving force of the organization. GEO considers technology to be a fundamental resource for the advancement of humanity. GEO's virtual workplace is an essential resource to enact a solution to address this PoP. The GEO virtual platform allows volunteers and members to access a wide range of digital publications and a virtual hub for networking and collaborating on projects that require creativity and critical thinking. The executive team of the GEO Section can use the virtual hub to create customized events such as training and seminars for HEIs. However, the customization of events for increasing student achievement and well-being would require collaboration between HEIs and the GEO Section. A collaboration process can foster a psychologically safe environment in which the stakeholders, especially students, faculty members, and the GEO executive team, can interact, share their different perspectives, and develop ideas through their actions in the real world (i.e., interpretivism) to inform the decision for the customization of events for the benefit of students and for the growth of GEO members. Therefore, the implementation of this OIP can create a myriad of possibilities in terms of using technology for the benefit of HEIs (American Chemical Society, n.d.-c).

As a chair, I also have access to visual business intelligence tools to manage geographic units or sections. These tools are crucial for this PoP because they provide me with the means to stay connected with all members as well as access to tools to promote online seminars and a wealth of knowledge and experienced professionals of diverse engineering fields that are instrumental in developing educational activities bridging the gap between HEIs and the GEO Section (Cooper et al., 2018). Moreover, the virtual tools allow leaders of different sections to share issues and success stories and guide members to keep in touch with current technology developments relevant to booster shared activities between the GEO Section and HEIs.

In summary, I framed the PoP implying that the collaboration between the GEO Section executive board and faculty members, faculty administrators, and students is required to foster initiatives and bridge the gap between HEIs and the GEO. Finally, I highlighted the PEST analysis approach employed in this OIP. The PEST analysis considered the pandemic crises and identified driving and restraining forces to the adaptive challenge of this PoP. The analysis uncovered factors that influence the process of inquiry that will be addressed in the next section.

Guiding Questions Emerging from the Problem of Practice

I defined three essential guiding questions that include concerns about what strategies I should consider creating a climate of change and a safe learning environment to engage the GEO Section with the local HEIs. The engagement between HEIs and the GEO Section can forge productive collaboration to enact initiatives for bridging the gap between the local HEIs and the GEO Section.

What is the Behaviour I am Trying to Change?

Currently, the executives of the GEO Section are not developing activities that attract and motivate students from HEIs. In addition, the executive team of the GEO Section struggles to allocate time and resources to develop new activities that can address the disconnection between the GEO Section and HEIs. Certainly, restructuring the section to serve HEIs would take considerable effort, resources, and commitment. However, the GEO Section can mitigate the

problem by being more proactive in expanding the student and faculty members and selecting the right students and faculty leaders to take charge and work collaboratively with the GEO Section to design events to provide meaningful challenges for the students and allow them to also take ownership of the GEO Section. The need for strong leadership from HEIs should not be underestimated because poor leadership can preclude the functioning and the growth of the GEO Section.

Furthermore, as the main driver for this OIP, I need to know the organization's internal climate, encourage people to take a risk, be innovative, and mitigate barriers preventing them from carrying out the GEO vision. Thus, this OIP explores behaviour changes needed to elicit events that foster collaboration between the local HEIs and the GEO Section.

How do I Generate the Required Knowledge to Foster the Change Process?

The GEO Section's success in keeping a diverse portfolio of activities comes from its partnership with other professional organizations. Similarly, the GEO Section can positively impact HEIs if collaboration exists between the GEO Section executive team and faculty members who can be heavily involved in overseeing, and establishing events (e.g., seminars, hackathons) aligned with the GEO's and HEI's missions. The knowledge needed for the collaboration can come from a leadership process in which students' and faculties' perspectives toward events. Their perspectives can generate information or shed light on ways to trigger collaboration, share the limited resources, and foster a culture of belonging so that students feel there are people at the GEO Section who care about their future as professionals and as citizens who can contribute to our local community.

The number of students requesting mentors from the GEO Section and the number of faculty members becoming senior members are increasing (GEO Staff Member, personal communication, October 11, 2020). Consequently, it is the right time to gain momentum by fostering cooperation among potential change agents from HEIs and the GEO Section who have the essential knowledge to plan and implement this OIP. In this report, I consider the

knowledge from different stakeholders' perspectives to ensure fairness, diversity, inclusion, and equity in the process to assess an optimal solution for the PoP.

What Strategies Can I Use to Motivate the GEO Section Executives to Connect with Students and Young Professionals?

Without energy and urgency for change, stakeholders will never embrace change, and a lasting transformation will be hard to achieve (Cohen, 2005). Therefore, I strive to promote activities and approaches that can motivate the GEO executive team to connect with students and professionals from the local community. I can encourage the executives to use their leadership and networking skills to promote events

Moreover, the interactions between the executives and students are a motivating factor in assuring the GEO Section's vitality by creating a sound succession plan. However, the strategies to energize the executives can trigger resistance to change. As a result, there is a risk of triggering anxiety, deferring work or change avoidance. Consequently, it is critical to mitigate the risk perceived by providing the executive team with ways to visualize and maximize values based on the GEO Section's capacity to take a risk. This OIP uses models and frameworks presented in Chapter 2 to promote interventions to reduce resistance and motivate the executives to create a supportive climate to overcome this PoP.

The questions and answers provided me with a moment of reflection toward potential solutions in the OIP. The PoP can be addressed through a process of collaboration that create a supportive climate between the GEO Section and HEIs in which students and faculty members have a strong ownership and are engaged in a clear leadership structure that empower them to plan, implement, and oversee student-centred activities aligned with the GEO's mission and HEI strategic plans.

Leadership-Focused Vision for Change

In the present stage, the GEO Section is engaged in promoting a regional science fair, preparing an engineering challenge for secondary schools, and hosting online seminars for

professional engineers. Currently, the GEO Section is not running projects or participating in joint activities with HEIs, although the number of GEO members in HEIs have increased, and faculty members and HEI administrators have demonstrated interest in increasing the ties with the GEO Section. As, a chair I am optimistic about connecting the GEO Section with the local HEIs because there are already several successful and inspiring stories across North America about attempts to bridge the gap between HEIs and a professional organization (Adams, 2016; Baldauff, 2016; Cooper et al., 2018; Fultz & Smith, 2016; Golden & Lolinco, 2016; Vander Pyl et al., 2016; Watzky, 2018).

The 2020 membership year was an unprecedented time in GEO's history (Kuenzi et al., 2021). Except for the executive team meetings and board of directors that could be transferred to the online delivery mode, most events were postponed or cancelled. For example, the long-awaited GEO global congress was cancelled. This event brings together the grassroots leadership of GEO to share ideas, concerns, and solutions. Furthermore, GEO membership suffered deep losses worldwide. Most of these losses were a direct result of the COVID-19 pandemic (Maak et al., 2021; Song & Zhou, 2020). However, membership data from the first quarter of 2021 has shown a trend of quick recovery, especially for student membership (GEO Staff Member, personal communication, April 21, 2021).

The envisioned desired state encompasses students engaged in events aligned with GEO's mission, organized and promoted via a continuous and iterative collaboration process involving the stakeholders (i.e., students, faculty members, and the GEO Section executives). In the desired stage of my OIP, the local HEIs and the GEO Section will create a psychologically safe environment in which the stakeholders will engage with each other and share their perspectives about engineering education and practice. Although the stakeholders share a common goal, to bridge the gap between the GEO Section and HEIs, they have widely different tasks, occupational backgrounds, and networks of social interaction. Therefore, the stakeholders reflect different beliefs about the nature of reality (Hatch & Yanow, 2003; Mack, 2010; Pham,

2018; Schwandt, 2000), and the solution for the PoP will be constructed by assembling it from the minds of stakeholders through open communication (Schein, 2013). Thus, the stakeholders will make sense of their experiences and inform actions to develop influential events to provide students with extracurricular activities to bolster their academic experience and future professional career (Watzky, 2018; Wright & Keirstead, 2018).

In summary, in the desired stage, a collaboration process between the GEO Section and HEIs will establish and sustain a psychologically safe environment in which students can try a myriad of extracurricular activities that are supported by GEO and effective in addressing the PoP or bridging the gap between the GEO Section and HEIs. The GEO Section will strategically promote a diversified set of activities to appeal to a broad group of students with various career objectives and interests. The activities include engineering challenges (Dolan, 2013), field trips (Wright & Keirstead, 2018), and hackathons (Feder, 2021). Consequently, in the desired state, students will acquire engineering skills following their career interests and essential competencies for facing the challenges of the 21st century: creativity, critical thinking, communication, and collaboration (Fullan et al., 2018). Furthermore, the desired state defined for this OIP is in resonance with GEO's mission, vision, and strategic plan to become a trusted source for providing educational and professional opportunities for the next generation of engineers through collaboration and knowledge sharing.

As a section chair, I can request the GEO Section allocate a portion of its educational projects budget to student activities. The development of student events is not a burden on the section's budget. The GEO Section can also receive financial assistance directly from the GEO Foundation, which relies on donations for educational purposes, especially for HEIs. The foundation provides student initiatives or projects with grants, awards, and scholarships (American Chemical Society, n.d.-b, n.d.-f, n.d.-g) to encourage students to create innovative projects.

Despite the 10% of overall membership losses (GEO Staff Member, personal communication, December 31, 2020) due to the closing of major manufacturers in the region, students and faculty members have joined the GEO Section to remain technically current, network, and participate in humanitarian activities. Organizational data revealed over 80% of new members who joined the GEO Section in the last 3 years were young professionals, faculty members, and students from the local HEIs (GEO Staff Member, personal communication, December 31, 2020). The overall membership trend reflects what has been occurring in the local industrial landscape. Large international manufacturers are closing or decreasing their operations. In contrast, small local businesses and schools are expanding. Arguably, GEO student members' interests go beyond science and math taught in their classrooms, which resonates with the purpose of this OIP and the action plan launched by COC (College Faculty Member, personal communication, October 23, 2020), which highlights the importance of fostering the collaboration between HEIs and professional organizations and associations (Canadian Engineering Memorial Foundation, n.d.; Grossman, 2012; Mata et al., 2010). Thus, HEIs have an impact on the definition of the desired state for the GEO Section.

According to my vision for change, the GEO Section can reach the desired stage by addressing the following priorities: (a) ensure members of the GEO Section have a clear and shared understanding of the organization's challenges via clear leadership structure (Emory & Raymond), (b) address declining membership (Brouet, 2016), and (c) increase the GEO Section participation in events organized by HEIs and development of joint events with local HEIs (Fultz & Smith, 2016).

To address the first priority, I will accurately assess the current situation by fostering open communication in which people in low-risk settings can use the inquiry (Schein, 2013, 2016) to identify elements from the organizational culture, such as assumptions or beliefs. According to Schein and Schein (2018), leaders and culture are intertwined. These authors further argued that the unique and essential leadership function is about building and shaping

the organizational culture (Schein & Schein, 2018). The open and trusting relationship is essential to explain and ensure that GEO members, including the executive team, have a common understanding of the organization's challenges and the benefits of fostering the GEO Section's ties with the local HEIs (Grossman, 2012; Mata et al., 2010; Vander Pyl et al., 2016).

To address the second priority, the GEO Section can increase the number of members by offering new forms of support for students such as awards and scholarships, revenues from the GEO headquarters as rebates, and human resources to fund initiatives to achieve engagement with HEIs (American Chemical Society, n.d.-b; n.d.-f, n.d.-g). The available resources and positive outcomes will attract more GEO members and volunteers from HEIs interested in leadership roles and joint projects with the GEO Section (Brouet, 2016).

Finally, to address the third priority, the GEO Section will develop local events and projects that positively affect the HEIs with the participation of students and faculty members. The GEO Section's executive team would not provide students with closed solutions; instead, it would ensure that they have a learning environment to obtain their own solutions for real-world problems (Youngerman & Culver, 2019). Consequently, students will be exposed to the skills needed to face the challenges of the 21st century (Fullan et al., 2018;) and recognize the importance of GEO for their career development. Therefore, the OIP's breadth and depth in terms of positive outcomes are incommensurable if a proper collaborative and distributed leadership steps up to foster the collaboration between the GEO Section and the local HEIs.

Change Drivers

In this OIP, change drivers are defined as internal or external forces affecting the organization and pushing it toward the desired stage. Three essential change drivers (Deszca et al., 2020; Whelan-Berry & Somerville, 2010) are identified. The first is the learning environment created in the executive team by the main change agents (Deszca et al., 2020): the treasurer, the past chair, and me as the section chair. This environment has built an open and trusting relationship essential to accelerate actions to implement this OIP. Not surprisingly, the

change agents have consistently kept a diversified portfolio of events, collaborated with PEO, OACETT, and have sponsored and organized hackathons (Feder, 2021) and technological showcases for the local community. Furthermore, the open communication form has become a powerful change driver because it has facilitated discussions with diverse groups, including students, educators, engineers, and employers. This style of communication has nuances from strategies of humble inquiry (Schein, 2013) that stimulate open and honest communication through genuine inquiry absent of the intention to influence responses.

The second driver is the sense of urgency (Kotter, 2008) to expand the section's leadership roles to ensure the robust succession plan's development, which was interrupted by the COVID-19 crisis (Maak et al., 2021). GEO lost a considerable number of higher-grade members who were especially essential for the section's vitality and leadership. Senior members are important because they have an average retention rate above 90% and provide leadership on a volunteer basis (GEO Staff Member, personal communication, January 8, 2021). The GEO Section has partially mitigated the problem by working in partnership with local chapters of professional engineering associations (OACETT, n.d.; OSPE, n.d.; PEO, n.d.). Unfortunately, the GEO Section is stagnant, and the lack of volunteers in leadership roles precludes the section's ability to launch new events that are beneficial for students, such as the mentorship program (American Chemical Society, n.d.-d). Consequently, the sense of urgency (Kotter, 2008) to expand is a driving force making the executive team seek solutions to overcome the current membership losses (Brouet, 2016) and create momentum for the section to improve its outreach regarding prospective members and local community leaders who can facilitate events that resonate with this OIP (Baldauff, 2016; Cooper et al., 2018).

The third change driver is the GEO global community's excellent reputation and vision that stress innovation, knowledge sharing, professional development, and educational resources to support lifelong learning. GEO's reputation is also evident because of its efforts for developing standards for the industry and code of ethics that clearly outlines the importance of safety,

health, and welfare of the public, sustainable development practices and accountability for governance choices in new or disrupting technologies (Habash, 2017, 2019). This driving force positively affects the GEO Section because it helps the organization maintain valuable connections to engineering associations (OACETT, n.d.; OSPE, n.d.; PEO, n.d.), schools, and government offices.

The three drivers are particularly critical because they tend to immerse the GEO Section in a system in which professional organizations, industries, and schools are working independently yet are engaged in a collaborative process. This interplay might trigger an evolution that draws inspiration from biological DNA. Like a living organism, an organization cannot exist by functioning as a standalone agent. Without interactions with other organizations, the GEO Section will have a lower value because of the risk increase (Koenig, 2018).

In summary, I defined the present and the desired stages of the GEO Section and highlighted priorities for a change to foster collaboration between the GEO Section and local HEIs. Finally, I presented the essential drivers to trigger and maintain a change process, including the sense of urgency to expand the section's leadership capacity. No change effort will be successful unless the drivers and stakeholders understand and believe change is essential. In the next section, I will use the driving and resisting forces affecting this OIP and determine the GEO Section's readiness to change.

Organizational Change Readiness

For the change leaders to determine a proper direction to achieve the desired state outlined in this OIP, it is essential to assess the readiness and need for change by understanding the internal and external forces at play inside and outside of the organization. Force field analysis and the stakeholder analysis called six readiness dimensions (Deszca et al., 2020) are essential tools for advancing the change leader's understanding of the informal organization system and determining its readiness for change. The first tool, force field analysis, is a powerful

theoretical concept that underscores the entire change model. Force field analysis is also useful for planning the change initiative's details. The second tool is a questionnaire to raise awareness concerning readiness for change. The information used for assessing the readiness for change has come from different channels. Some data are derived from the GEO visual business intelligence tool. As a section chair, I can use the tool to access reports about membership, including occupational background and retention rate. Other data used are less tangible and have been collected informally by me through numerous contacts and participation in events held in the local community, notably the monthly executive meetings and activities promoted in partnership with the local chapters of engineering professional associations.

This OIP does not use scientific approaches for data analysis. However, there is a perception that the quality of the information harvested is high because of two factors. First, the internal information was collected from the GEO executive team meetings in which conversations are psychologically safe, leading to trust, better communication, and collaboration (Schein & Schein, 2018). The second factor that highlights the data quality comes from my active participation in external events promoted in partnership with local chapters of professional associations. I am a professor at COC and an executive for the local PEO Chapter; therefore, I have daily contact with prospective change leaders and change recipients. Consequently, the GEO Section has well-developed internal and external informal mechanisms for collecting vital information to describe the current organization's status quo with high confidence, enabling executive leadership to deeply consider concerns and supporting an increased awareness of the need for change.

Force Field Analysis

Appendix A shows the force field analysis derived from the PEST analysis factors. It represents a complex system of nonlinear forces and is not aligned in any given direction of change. This system helps the change leaders understand which forces may help and which may impair the change attempt. The restraining and the driving forces are divided into internal

forces within the GEO Section (shaded arrows) and external forces outside the organization (unshaded arrows). The size of the arrows depicts the strength of the forces. The analysis reveals immediate external forces (e.g., calls to action from schools and the Minister of Education) and long-term external forces that will create opportunities for future growth (e.g., increasing international students).

As shown in Appendix A, the internal restraining forces, especially poor retention of students and low leadership engagement, have great strength. These forces place considerable pressure on the executive to improve their performance in terms of membership development to increase their capacity to respond to the immediate external forces. The force field analysis indicates that the GEO Section's external connections with schools and professional associations constitute vital forces that can be used to alter the equilibrium of forces and make change occur by making driving forces exceed the restraining forces. The force dynamics observed are also indicators highlighting the need for change.

Six Readiness Dimensions

For the GEO Section to efficiently address this PoP, it must be open and ready for change. Deszca et al. (2020) suggested organizational change readiness can be determined through an inquiry process based on six readiness dimensions, as shown in Appendix B. The assessment for organizational readiness for change covers the following dimensions: previous change experiences, executive support, credible leadership and change champions, reward for change, and measures for change and accountability.

Previous Experience and Adaptability

The GEO Section has recently changed its way of composing the team to organize and promote the local engineering symposium. For the first time, the organizing team had a few members who did not have an engineering background or ties with any professional engineering associations. The new individuals brought their creativity to create high-quality posts, improved the organization's presence in social media, and reached the general public using their network.

The experience was a tremendous success. For the first time, the symposium had more than 200 hundred participants and a vibrant discussion panel that integrated engineering topics with ethics, social justice, and leadership. The change in organizing a symposium was a positive experience, and the mood of the GEO Section members and their partners was upbeat and positive. They realized it is possible to tweak existing events and promote positive changes. I used the symposium case as a significant motivating factor to inspire the GEO Section members to believe and promote change that connects the GEO Section with the local community including HEIs.

Executive Support

The GEO Section executives, especially the past chair and current vice-chair, are interested in sponsoring initiatives to expand membership and increase members' commitment to leadership roles. They also are engaged directly with activities involving local secondary schools. Every year, the GEO executives are instrumental in organizing and promoting the local engineering challenge for secondary schools. Furthermore, they are also willing to participate in activities to bolster leadership and technical skills of young professionals and students graduating from the local HEIs. I consider the GEO Section senior members as prospective change facilitators who can play a significant role in moving this change initiative forward.

Credible Leadership and Change Champions

The senior leaders, the treasurer, the past chair, and I are deeply involved in several events to foster STEM activities. The senior leaders are also part of the local PEO Chapter and members of the National GEO Board. Therefore, the senior leaders are trusted in the organization and in the local community. Furthermore, the senior leaders are likely to view this proposed initiative as generally appropriate for the organization because it is aligned with the GEO's mission that addresses the critical need to inspire and educate the next generation of engineers. However, the executive team has faced difficulties attracting and retaining capable

and respected change champions. These difficulties constitute one of the greatest restraining forces in this OIP, as shown in the force field analysis (see Appendix A).

Openness to Change

Effective internal communication and scanning mechanisms to monitor the internal and external environment (Schein & Schein, 2017) are part of the GEO Section culture. The GEO executive team members, who are the potential change agents, have worked together effectively and created mutual trust and open communication that are excellent stimuli to create momentum for change and a learning environment. New GEO senior members have been available to adopt leadership roles, but there are still uncertainties regarding their expectations and how they can implement this change.

Rewards for Change

A sense of psychological safety is present in the GEO Section. The executives foster an environment in which failures are tolerated and the lessons learned from them are important to improve the change process. They are open to change and understand the value and importance of capturing new ideas to address problems such as low retention of students. Looking to the future, although they are not open to disruptive changes, the GEO executive are ready for adaptive changes, as is highlighted in this OIP.

Measures for Change and Accountability

The organization measures and evaluates members' and stakeholders' satisfaction through semiannual online surveys. The results of surveys are compiled by the GEO executive team and then used for assessing the need for change and tracking progress. GEO has a mechanism to collect critical data for a change. As a section chair, I have access to a sophisticated set of graphical tools that enable me to follow what is happening with membership in real-time, with the most notable being retention. I keep track of the number of attendees for local events, distribute questionnaires, and collect their feedback. Additionally, at the end of each GEO event, I run a debriefing meeting to internalize new lessons.

Readiness for Change Questionnaire Summary

The results of the questionnaire show that the GEO Section is ready for change. The score needed to indicate readiness should be higher than 10 and the GEO Section scored 31 (see Appendix B). Overall, the above results from the readiness-for-change questionnaire (see Appendix B) indicate that members of the GEO Section are open to change, enjoy open and trusting relationships with other members, and understand that transparency of the change process is critical to build trust and reduce learning anxiety. Despite the openness, collaboration, and commitment to possible changes, the organization has not been able to attract change champions or influencers who can influence the collaboration between the GEO Section and local HEIs. There is an apparent leadership stagnation or lack of members willing to take on leadership roles. Continuing to utilize questionnaires may help me identify potential change agents, areas that need strengthening, and plan interventions to launch change initiatives to reduce the restraining forces.

In summary, I highlighted the importance of assessing the readiness for change and introduced two assessment tools. I used the force field analysis that revealed the external forces placing considerable pressure on the executive team to accept change. Finally, I evaluated the GEO Section's change readiness using Deszca et al.'s (2020) change readiness questionnaire. The results showed that the GEO Section is ready for change.

Chapter Summary

In this chapter, I introduced the PoP of this OIP and the organizational context in which it is situated. A review of the literature and PEST analysis, which suggest that moving forward requires open communication and collaboration between the GEO Section and local HEIs' faculty and student body. I noted key change drivers and assessed the organization's change readiness. I also identified several restraining forces within the organization. I discussed critical external forces to create momentum for the change, including a request from GEO headquarters to develop events to address the gap between HEIs and GEO sections. Chapter 2 uses leadership

approaches, including the adaptive leadership framework and Schein's (2017) sociopsychological model of learning and change, to enact a plan that will address the PoP.

Chapter 2: Planning and Development

This chapter examines the leadership approaches and the change model selected to address the PoP presented in Chapter 1. Subsequently, three workable solutions are introduced, along with their advantages and disadvantages. The best solution is identified and presented using the plan-do-study-act cycle (Bernhardt, 2018). Finally, ethical leadership concerning the proposed change and leadership approaches are presented.

Leadership Approaches to Change

Although there is no one-size-fits-all leadership framework, building a customized leadership approach reflecting on the existing leadership theories is possible. This section sheds light on the leadership process that creates momentum to make the GEO Section ready to develop adaptive tactics toward the desired state presented in Chapter 1. Based on the assumption that human behaviour is complex (Schein, 1980), this OIP adopts a leadership landscape defined by adaptive (DeRue, 2011; Uhl-Bien et al., 2007), humble (Schein, 2013; Schein & Schein, 2018), and distributed (Gronn, 2002; Harris, 2013; Harris & Spillane, 2008; Lumby, 2013; Spillane, 2006; Spillane et al., 2004) leadership approaches. These methods can co-occur across time and multiple stakeholders, especially from HEIs and local chapters of professional associations. Furthermore, the leadership approaches previously mentioned mesh well with the interpretivist paradigm (Creswell, 2014; Hatch & Yanow, 2003) and will build a collaborative synergy among GEO's executives and external recipients of the change, especially students and faculty members of the local HEIs. Moreover, the collaborative synergy will help the GEO Section go beyond its policies and learn from its unwritten rules and culture.

Adaptive Leadership

This OIP will require people to learn new ways to bridge the gap between HEIs and the GEO Section. Therefore, the problem to be addressed by this OIP is complex, and technical strategies that use the status quo combined with one authority's lead process will not solve the problem but aggravate it. According to Heifetz and Linsky (2002), complex problems are adaptive challenges,

and the more involved they are, the more target agents should be seeking solutions. Consequently, the gap addressed by this OIP is an adaptive challenge; there is no predetermined solution or any technical fixes available for reaching the desirable state.

Adaptive leadership (AL) is a practical framework that can help the GEO Section face adaptive challenges because AL lets leaders listen and learn, find where people are, and determine the best actions considering what they already know (Fullan et al., 2018; Heifetz, 1994; Heifetz & Linsky, 2002; Heifetz et al., 2009; Valeras & Cordes, 2020; Yukl & Mahsud, 2010). The method can mobilize the GEO Section's executives and strengthen its ability to enact changes needed to tackle the PoP. Furthermore, AL can make the organization navigate through a period of disturbance that can upset the status quo and trigger conflict, frustration, and fear of losing something (Heifetz, 1994). However, the AL method has an ingrained mechanism to diagnose the system and deal with the disequilibrium. AL is a nonlinear and iterative process that unfolds in three key subjective events: observation, interpretation, and intervention (Heifetz et al., 2009).

The first event is explained by the metaphor, "Get on the balcony" (Heifetz, 1994, p. 126). This metaphor implies that I should gain some distance to have a holistic view and take a moment for drawing a mind map to understand better the organizational culture, the ties the GEO Section has with different partners, including HEIs, and the implications of the adaptive challenge of this OIP over the structure of the GEO Section and stakeholders. Furthermore, the first event also indicates it is time to verify the dynamic of the supportive and impeding forces determined in the PEST analysis presented in Chapter 1.

The second event, interpretation, is explained by the metaphor, "Song beneath the words" (Heifetz et al., 2009, p. 34). The information from the observations is unpacked to estimate what is occurring in the organization and with its stakeholders (Heifetz et al., 2009). Therefore, this is an activity for listening and interpreting voices and people's behaviours, beliefs, and assumptions that are part of the organizational culture. I have been applying this metaphor's essence through open conversation that allows a clear understanding of the shared values and beliefs that make up the

GEO executive team. Furthermore, listening will be useful in this OIP to detect subtle signs of resistance in the embryonic stage so that corrections to the change path can be made without compromising the process of change (Lewis, 2019).

Finally, the third event is explained by the metaphor, “On the dance floor” (Heifetz et al., 2009, p. 7). This event is a critical part of this OIP because it represents the time when interventions occur; for example, it is the time for me, as a section chair, to apply the customized leadership approach to pursue the vision of this OIP to bridge the gap between local HEIs and the GEO Section. Afterwards, I should *get on the balcony* and listen to the *song beneath the words*. Then, I should keep moving back and forth between the balcony and *dance floor* to assess what is happening in the organization (Heifetz et al., 2009). To implement the AL actions explained by these metaphors, I will meet with all stakeholders before and during the events to learn about the stakeholders’ experiences and what changes should occur to improve processes that affect significant decisions regarding the organization of the events to address the PoP.

Humble Leadership

Humble leadership (HL) is built on trust and openness created by personal cooperative relationships as in friendships (Schein & Schein, 2018). This approach creates relationships that empower teams to build *adaptive capacity* to accelerate the change process. Moreover, HL helps create an environment that connects people of different national and occupational cultures and keeps their collective focus on shared goals. All leadership theories are based on relationships. HL is concerned with personal relationships that are critical for building trusting relationships. Therefore, HL creates a climate in which members trust each other enough to share information and honestly critique each other’s ideas through an open conversation like in friendship or in high-performance teams. The approach has everything to do with building relationships that get the job done and avoid the indifference, manipulation, and even concealing that often happens in the working relationship. The advantage of HL is that it can

foster agility, members' engagement, and innovation through personalized and cooperative relationships guided by inquiry.

As Schein (2013) noted, the inquiry that is the basis for HL is an effective way for me to ensure collaboration and place faculty and student GEO members to empower the GEO Section's executive team to bridge the gap between HEIs and GEO. Furthermore, the inquiry process will allow me to reveal beliefs or assumptions hidden in the executive team culture that can only be uncovered by a learning mindset that promotes trust and openness. The GEO Section resonates with HL because a trusting relationship is one of the core values of the GEO Section executive team. Moreover, the GEO Section meetings foster interpersonal relationships. The meetings also serve as opportunities for me to understand better the team members' attitudes and feelings involved in a decision or affected by it.

Consequently, HL builds psychological safety by reducing barriers to change or reducing the threat inherent in recognizing past failures. Details of a failure can be uncovered by the HL process that is the basis for constructing a trusting relationship by leaders asking questions beyond formal communication processes instead of telling followers what to do. The personal cooperative relationships already exist in the core of the GEO executive team, including the past chair, vice-chair, secretary, treasurer, and my role as section chair. One of the challenges for implementing the leadership processes is extending the adaptive and collaborative concepts of HL to other key stakeholders that will be involved in this OIP.

Distributed Leadership Approach

Leaders acting alone cannot achieve the desirable change (Harris, 2013). Consequently, to meet my organization's needs, I will concentrate my efforts on developing others' leadership qualities and capacity. However, distributed leadership (DL) is not simply about increasing leader roles. Successful DL depends upon establishing mutual trust that is essential for the progressive and effective distribution of formal and informal forms of leadership practice (Harris & Spillane, 2008; Spillane, 2006; Spillane et al., 2004). In DL, people's interactions are

more important than the nature of leadership roles (Goldstein, 2004; Gronn, 2002). In addition, DL resonates with interpretivism as it fosters inclusiveness, creating a networked community considering multiple perspectives of what may be real. As underlined by ontological assumptions of interpretivism, people interpret events differently and construct multiple perspectives of one incident (Mack, 2010).

In this OIP, the AL and HL approaches will be combined with DL to integrate multiple stakeholders and enact the change initiative. DL can increase satisfaction and cohesion among team members. DL will also help the GEO Section by making the decision-making processes decentralized, more inclusive, and extended to students. Consequently, DL can play a key role in easing the burden of the overworked GEO executive team. Furthermore, Liu (2017) argued DL can make actions more transparent and leaders more vulnerable. He went on to state if the leader is transparent and vulnerable, people know what is going on and tend to create an environment in which leaders and followers are honest and virtuous (Liu, 2017).

I propose a leadership approach based on three steps. In the first step, the AL and HL would create a learning environment to help the executive team internalize the mission and develop an action plan to elicit the solutions. In the second step, the executive team will expand its local network using the DL approach. In this OIP, DL will be instrumental in extending the HL and AL approaches to other stakeholders during the planning and development phases of this OIP to be discussed in Chapter 3. The DL offers a way for the GEO Section to work collaboratively with students and young professionals to develop potential solutions for the GEO Section to address the PoP by bolstering creativity, critical thinking, and leadership competencies essential for bolstering change initiatives to promote collaboration between the local HEIs and the GEO Section. Therefore, the DL approach will not provide solutions to issues but will empower both change leaders and change recipients to create a learning environment with financial and professional support from the GEO Section. Ultimately, with the GEO

executive team's help, the students will create solutions to overcome the gap between HEIs and the local GEO Section.

Framework for Leading the Change Process

Organizations deal with internal integration and external adaptation (Schein & Schein, 2017). Like any living creature, an organization survives by acting and reacting to its external environment. Therefore, change cannot be managed or controlled in a literal sense (Fullan, 2020). Nevertheless, it is possible to define a careful change process from the readiness analysis presented in Chapter 1. Readiness is of paramount importance for understanding the transformation process and removing obstacles (Kotter, 2009). However, it is just the starting point of the change process to bridge the gap between the present and desired states (Burke, 2018). The next step is to select the strategies for enabling the change. The choice of the right method is crucial to promote changes and overwhelm resistance (Cohen, 2005; Kotter, 2014b). When people's resistance is high, the change initiative's success is unlikely (Deszca et al., 2020). There are several aspects to be considered about defining a framework for leading the change process without creating silos or unnecessary hierarchical layers. In this OIP, the first step is considering that the change process is about vision and the opportunity to ensure the GEO Section's vitality and agility to follow the local network. Moreover, the first step involves creating a learning environment in which it is possible to aggregate change management, trust, collaboration, teamwork, and leadership (Cooper et al., 2018; Curfman et al., 2018; Watzky, 2018). Furthermore, the change process adopted resonates with AL, HL, and DL approaches, and it is congruent with the interpretivist lens (Hatch & Yanow, 2003).

Kotter's Eight-Stage Model

A literature review revealed diverse ways of leading the process of change. Kotter (2012) defined it as an approach to initiating a top-down transformation. Kotter (2012) argued organizational change is not an event but a multistep process that should be orchestrated by a leader who can trigger the desire to contribute to some more significant cause, thereby shedding

light on a better future for the organization. Kotter's (2012) model is prescriptive and is based on eight stages:

- Establishing a sense of urgency.
- Creating the guiding coalition.
- Developing a vision and strategy.
- Communicating the change vision.
- Empowering people for broad-based action.
- Generating short-term wins.
- Consolidating gains and producing more change.
- Anchoring new approaches in the culture.

Kotter (2012) suggested leaders move through all eight predictable stages in sequential order (see also Deszca et al., 2020). Kotter (2012) provided a highly structured and detailed change process. He introduced several aspects vital for a change process, including a sense of urgency, a guiding coalition, and celebration that can be merged with other empirically derived models. Kotter's (2012) change model is simple and straightforward for practitioners. Not surprisingly, it is one of the best-known frameworks for organizational change. Kotter's (2012) process has been described as multiple steps of a linear progression or a sequential procedure (Pfeifer et al., 2005). A traditional reading of Kotter's (2012) model demonstrates the importance of following the model step by step to avoid getting too far ahead without a solid base (Pollack & Pollack, 2015).

The Kotter model is typically depicted in the literature as a top-down, deterministic, linear, sequential model (Pollack & Pollack, 2015). A linear change model can not represent the complexity of the human relations involved in this OIP. As a result, Kotter's (2012) model becomes incompatible with AL and HL approaches used in the OIP because these leadership approaches consider human relationships part of an interactive and even unpredictable process. Later, Kotter (2012) acknowledged that earlier stages could be revisited, suggesting converting

the model to a nonsequential one. More recent literature addressed the shortcomings of Kotter's (2012) model by depicting adaptive approaches considering different guiding coalitions working concurrently (Pollack & Pollack, 2015) or a nonlinear process in which the steps of the model can be revisited and revised. Therefore, new change processes suggest that Kotter's (2012) model can be used as an iterative approach to lead a change initiative and respond to emergent and contextual needs.

Although there are empirically derived models that merge Kotter's (2012) change model with iterative processes, few case studies in the academic literature inquire into how this process has been used in practice. Even the traditional Kotter's (2012) model that is structured in linear steps lacks rigorous fundamentals or validation (Appelbaum et al., 2012; Kang et al., 2020). Most of the evidence found during my literature research about Kotter's (2012) model has been compiled by Kotter himself (Appelbaum et al., 2012; Kotter, 1996; Kotter & Cohen, 2002). Lastly, the studies in the academic literature about Kotter's model do not investigate how the process can be used with HL and AL approaches that are central for this OIP.

In summary, Kotter's (2012) is a prescriptive framework focused on executing the change rather than on human relations, despite its clear strengths. In addition, the application of the multistep model can be time-consuming and issues can arise if even a single step is skipped. Lastly, integrating all eight steps in an adaptive and nonlinear process that can merge with Hl and AL approaches remains under investigation in the empirical or academic literature. As a result, Kotter's model is not selected for this OIP.

Change Path Model

Deszca et al. (2020) proposed the change path model (CPM), which is both prescriptive and descriptive and has fewer instructions than Kotter's (2012) eight-stage model. The CPM consists of four steps: awakening, mobilization, acceleration, and initialization. Awakening describes the stage in which leaders identify the need for change, articulate the gap between the current and desired stages, and craft and disseminate a powerful vision. Mobilization can be

described as making sense of the desired change, assessing the power at play, and leveraging resources to launch the change. The acceleration stage is about engaging and empowering stakeholders, planning, and implementing change. An essential part of mobilization is the celebration of wins to build momentum to accelerate the change process. Finally, institutionalization describes the stage in which the organization achieves the desired state and is measured, evaluated, and monitored to mitigate risk and identify what needs to be changed.

Based on Deszca et al.'s (2020) description, CPM is an easy-to-understand roadmap that change leaders can follow for operations, control, and measures. Despite its strengths, the CPM maintains that a change process has predictable stages and must have a beginning, middle, and end. The CPM does suggest some valuable components that could still be used in my OIP, such as establishing a sense of urgency and celebrating short-term wins and milestones that are essential to build momentum and accelerate the change process.

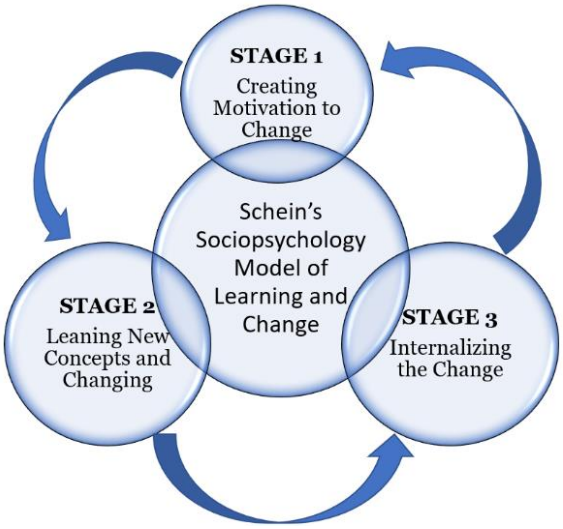
However, the CPM lacks a connection to my PoP because it is a predictable linear process. Therefore, combining both CPM and the chosen leadership approaches for the OIP comes to a challenge because AL and HL approaches are iterative and focus on the complexity of human beings and their interactions to make sense of their multiple perspectives. Furthermore, the predictability of the CPM conflicts with my interpretivist lens that considers the unpredictability of human nature and focuses on decisions based on the reality produced by social interactions. As such, the CPM model is not selected to enact this OIP.

Schein's Sociopsychological Model of Change

For this OIP, I will adopt Schein's sociopsychological model of change (Schein & Schein, 2017) because it is aligned with the adopted HL (Schein, 2013), as depicted in Figure 2. In real-world settings, the stages may overlap, and change agents sometimes need to cycle back to earlier phases to develop a supportive and psychologically safe environment to trigger new learning. Schein's change model (Schein & Schein, 2017) depicted in Figure 2 does not necessarily unfold in a linear sequence.

Figure 2

Schein's Sociopsychological Model of Change



Note. Based on the work of *Humble Leadership: The Power of Relationships, Openness, and Trust* (5th ed.), E. H. Schein & P. A. Schein, 2018, Berrett-Koehler.

Schein and Schein (2017) developed a model that can assess the readiness to change, lead the change process, or review process after implementing interventions. Therefore, Schein's change model (Schein & Schein, 2017), detailed in Table 1, defines an interactive process that uses continual feedback between internal and external forces and actions. The process considers that organization is a complex result from the interaction between human beings and the environment in each situation (Johansen, 2017; Schein, 1980). Furthermore, with a focus on open communication and people's empowerment through learning, the model works congruently with the interpretive approach described in Chapter 1 (Schein & Schein, 2017) because it focuses on the interaction of stakeholders (i.e., students, faculty members, HEI administrators, and the GEO Section executive board) and forming meaning through these exchanges (Creswell, 2014) via observations and open conversations. Therefore, the model considers that stakeholders interpret events differently, and their perspectives or viewpoints should be integrated into the initiative change (Creswell, 2014). As shown in Table 1, Schein's

change model is divided into the following stages: (a) creating the motivation to change, (b) learning new concepts and changing, and (c) internalizing the change (Schein & Schein, 2017).

Table 1

The Stages of the Schein's Sociopsychological Model of Change

Creating the Motivation to Change
• Disconfirming the present situation or unlearning • Creating survival anxiety • Learning anxiety produces resistance to change • Creating psychological safety to overcome learning anxiety
Learning New Concepts and Changing
• Scanning and trial-and-error learning • Imitating a role model
Internalizing the change
• Integrating into personality • Incorporating into ongoing relationships

Schein and Schein (2017) identified the organization's culture influences the likelihood of successfully implementing change efforts and inferred that workgroup psychological safety is critical for change readiness. It promotes trust, enhances beliefs that change is needed, and encourages respect and open discussion that bolster positive emotions associated with the change event. Furthermore, open conversation has the power to bring hidden assumptions or beliefs to the surface.

As shown in Table 1, Schein's model is based on the sociopsychological dynamics of a change process. According to Schein and Schein (2017), the dynamics of a change process are based on a complex sociopsychological dynamic. Within this framing, Schein's change model (Schein & Schein, 2017) captures human behaviour as part of the complexity of today's volatile, uncertain, complex, and ambiguous world (Johansen, 2017; Schein & Schein, 2019).

Stage 1: Creating the Motivation to Change

The first stage is based on four change processes: disconfirmation, creation of survival anxiety, mitigation of resistance to change, and creation of psychological safety to overcome learning anxiety. Schein's change model (Schein & Schein, 2017) shows that change starts with disconfirmation, which means what is expected is not confirmed. For example, I expected much more robust ties between the GEO Section and HEIs since most new members are from HEIs.

However, disconfirmation does not suffice to trigger the process of change. It is also essential to determine why the organization should change and the factors that threaten the organization's survival. Initiating change is especially salient because people tend to resist or sabotage change initiatives, even when the goals are highly desirable (Gallos, 2006; Heifetz, 1994; Kotter, 2012). At this stage, I should confirm if the change is necessary and feasible and create the steering committee or change team. To develop a broad picture, change agents need to listen and learn from the target agents (Heifetz & Linsky, 2002; Lumby, 2013). Consequently, the change team will determine where the stakeholders are, their perspectives and their values, and what they already know. Concomitantly, the change team will review and confirm if the indicators of driving and restraining forces determined in the PEST analysis are valid and resonate with the change team assumptions. Stage 1 is also a moment to develop collaboration and psychological safety so that learning occurs and strategies are created from the experience of people involved in the process.

I will strive to reduce restraining forces so that survival anxiety or driving forces become more significant than the learning anxiety or restraining force. When this condition occurs, the change process can be launched. Overall, the GEO Section must react, adjust, and allow strategies to appear, step by step. In other words, in Stage 1, an interactive and learning process towards collaboration should be triggered.

Stage 2: Learning New Concepts and Changing

In the second stage, it is essential to identify the desired situation at the end of the change initiative. Leaders must also analyze the actual change needed to determine a solution and learn how to implement it. Schein and Schein (2017) argued a solution can be engineered and personalized through a learning process that consists of scanning the environment and using a trial-and-error approach until something works.

I will articulate my vision about the desired future state for the GEO Section evoking the PoP. I am looking for a change in the leadership capacity of the GEO Section. Currently, the executive team encompasses engineers and focuses on technical activities. I strive to expand the GEO Section's leadership capacity by including students and faculty members as change agents to foster HEIs' engagement with the GEO Section.

Moreover, by scanning the environment, I will determine the gap between the present and the envisioned future state, considering the different perspectives of internal stakeholders and outsiders to reduce bias and ensure objectivity. In this stage, the team needs to use their communication skills to connect with outsiders and determine stakeholders' different perspectives towards the PoP. Arguably, students and professors consider that the engineering programs should be mostly technical. In addition, they may have overly narrow perceptions of the professional aspects of engineering that require nontechnical skills. Professional engineers often consider communication and teamwork to be essential skills. The apparent nonconvergence of perceptions indicates that it is imperative to assess stakeholders' different perspectives to foster activities for bridging the gap between HEIs and the GEO Section.

Stage 3: Internalizing the Change

The final stage is about stabilizing new learnings through reinforcement based on the results. The leaders will examine the entire change process needed to fix the adaptive challenge and define new behaviour to produce better results. The change team will intervene and evaluate the change process to determine if new behaviour or implemented changes produce better

results (Schein & Schein, 2017). If the new behaviour does not produce better results, the changing process needs to be relaunched.

In this stage, I will explore the iterative process of the AL approach that consists of observing, interpreting, and intervening to verify if the lessons learned have been internalized and if the goals of the change plan are accomplished. Moreover, I will use HL to establish open communication and evaluate the entire change process following the perspectives of different stakeholders. The entanglement of the leadership approaches and Schein's change model (Schein & Schein, 2017) will be further discussed in Chapter 3 when the monitoring and evaluation process is explained in more detail. As a result, Schein's change model (Schein & Schein, 2017) defines a very interactive process that absorbs human behaviour's complexity, in which assumptions, perception, experience, and cultural norms are entangled. The framework meshes with adaptive processes that enable the change team and change targets to interact at a level at which open and personal relationships develop a sense of psychological safety (Schein, 2013; Schein & Schein, 2017). Overall, Schein's change model (Schein & Schein, 2017) aims to reduce restraining forces so that survival anxiety or driving forces become more significant than the learning anxiety or restraining force. When this condition occurs, the change process can be launched. The next section will analyze the elements that will integrate the framework for leading the change process.

Despite its simple appearance, Schein's change model is far from simplistic (Schein & Schein, 2017). It is a well-thought-out and robust approach based on a deep understanding of human psychology. Unlike CPM and Kotter's (2012) change models, Schein's model is nonlinear and encompasses an interactive process comprising naturally the human relation dimension. Therefore, the model can be perfectly intertwined with the AL and HL approaches that are also nonlinear, interactive, and based on human relationships.

Critical Organizational Analysis

The critical organizational analysis (Burke, 2018; Deszca et al., 2020) is of paramount importance to determine possible solutions for the OIP. It sheds light on strategies I can pursue based on the strengths and weaknesses of the GEO Section concerning the internal and external environmental threats and opportunities. The GEO Section analysis is complex because the organization collaborates with local chapter of engineering professional associations (OACETT, n.d.; OSPE, n.d.; PEO, n.d.), promotes a diversified portfolio of events, interacts with other GEO sections across Ontario, and follows policies and directives from the GEO headquarters described in Chapter 1. Consequently, the critical analysis should consider the organization as an open system, continually interacting with the complex external environment (Deszca et al., 2020; Gallos, 2006). An open system is defined as a "mechanism that takes input from the environment, subjects it to some form of the transformation process, and produces the output" (Nadler & Tushman, 1980, p. 37).

The Nadler-Tushman Congruence Model

As the section chair, I am the main change driver and must understand the GEO Section's behaviour in a more profound way. For example, I need to better understand how to align the available resources with the change plan, remove obstacles, and determine ways to mitigate the gap between the current situation and the desired one by fostering the collaboration between the GEO Section and local HEIs. Thus, I will consider a model that helps me examine the GEO Section and integrate what needs to be changed to enact the change (Burke, 2018). To understand the complexity of the relationships and to reach their most significant potential to address the PoP, I will use Nadler and Tushman's (1989) congruence model, as depicted in Appendix C.

The model is based on open system theory and can be presented metaphorically by an organism (Burke, 2018). Like an organism, it depends on the external environment, has input, transformation process, and output. The model can be considered a mechanism for analyzing

the current GEO Section state and identifying areas of improvement within the section to promote events to bolster the ties between the organization and HEIs (Buckwalter & Sweeney, 2020; Grossman, 2012).

The transformation process of the congruence model has four core components: input, strategy, transformation process, and output. I will focus on the transformation process that is divided into work, people, formal structure and informal structure, as shown in Appendix C (Nadler & Tushman, 1989). The effectiveness of the organization depends on the congruence level of the organizational components. Despite the organization's complexity, it is possible to analyze the four elements to determine GEO Section's behaviour and to understand the internal organizational components, how they interact with each other, and how they converge considering the external factors.

Inputs

The congruence model (Nadler & Tushman, 1989) defines three input components of an organization: environment, history, and resources. By analyzing input components with their constraints, it is possible to determine the change or transformation process. Input from the GEO Section environment, especially HEIs, need to be considered when seeking solutions that empower the GEO Section to answer the call for bridging the gap between GEO and HEIs of the local community.

The Environment and History. This component refers to the external factors that were identified by the PEST analysis presented in Chapter 1. The GEO Section operates in a complex environment that encompasses volunteers with diverse professional and cultural backgrounds from a rapidly changing industrial landscape, engineering associations, and HEIs. Understanding the GEO Section external environment's complexity is critical for enacting a decision-making process to align the GEO's and HEIs' strategic plans. As previously mentioned in Chapter 1, the GEO Section has members of various educational and occupational backgrounds, especially engineers, scientists, and educators. More recently, faculty and student

membership has increased. These members seek networking opportunities, events where they can meet professionals in fields of their interests to share ideas and explore possible joint projects with the GEO Section. Further, the increase of membership from HEIs implies that the GEO Section executive should increase its portfolio of events or foster activities to reduce the gap between the organization and the local HEIs.

Resources. Nadler and Tushman (1980) defined resources as organizational assets, including human resources, technology, capital, information, and less tangible resource resources such as recognition (Deszca et al., 2020). At the GEO Section, the most critical asset is human resources. The volunteers of the section in leadership roles are already busy with the current diversified portfolio of events. Therefore, new opportunities must be aligned with an expansion of leadership capacity. The GEO Section already has some resources that can help the local section mitigate the problem. Members who are potential leaders can attend the GEO volunteer leadership training. As such, one of my challenges as a chair is influencing and motivating members to take the training. Another critical resource is the financial one. As a section chair, I can request funding from the GEO Headquarters for students' events. There is also funding from the Canada GEO foundation for scholarships and outreach projects focusing on the humanitarian problem. However, according to the GEO policies, the foundation's resources can be accessed by the GEO Section only through a formal affinity group for students that is a group in which students have opportunities to build essential skills outside of the classroom. Therefore, encouraging more students from HEIs to be engaged in leadership roles would significantly raise the financial resources for fostering events that address the PoP by bridging the gap between the GEO Sections and HEIs.

Strategy

The GEO Section strives to align its annual plan with the GEO Headquarters' direction regarding the development of educational activities for HEIs. However, there is still no action plan or a well-defined and communicated strategy between the GEO Section and HEIs. The lack

of communication prevents the GEO Section and HEIs from getting together to develop activities aligned with their respective strategic plans.

According to Nadler and Tushman (1980), "strategy is critical because it determines the work to be performed by the organization and it defines desired organizational outputs" (p. 43). Therefore, one specific objective I must set for the organizational output is to communicate clearly with the GEO Section executive team and other stakeholders the importance of addressing the PoP.

Transformation Process

The components or information from inputs are combined to produce a dynamic transformation process composed of four essential components: informal organization, work, people, and formal organization (Nadler & Tushman, 1989). The critical part of the process is to ensure congruence among the components. The interaction between these components will create desired outcomes to advance a strategic plan to foster the ties between the GEO Section and the local HEIs.

Work. The PoP for the OIP, as described in Chapter 1, points out the lack of the GEO Section participation and support of events that offer opportunities to students to attend extracurricular activities such as engineering challenge (Dolan, 2013) and hackathons (Feder, 2021). As the GEO Section chair, I can advise and lead the executive board toward opportunities that increase the engagement of the section with students and faculty members (Blankenbuehler & Van Ness, 2018; Watzky, 2018). These actions resonate with the organization's mission, vision, and core values aligned with member engagement and learning opportunities for the next generation of professionals by fostering collaboration between HEIs and the GEO Section. However, a central problem is how I can enact a strategic plan or a strategy that maintains congruence of the transformational process components in the GEO Section. Additionally, I need to identify how I can help the organization go through the whole process and keep a high level of satisfaction from volunteers (Edwards, 2011; Hobbs, 2011), especially those in leadership

roles. At nonprofit organizations, volunteers' professionalism "means that volunteers should be managed in a way that increases their effectiveness and satisfaction and decreases the risk to the organization" (Terry et al., 2011, p. D.13). There is no one best way of handling the problem. However, I can help in making decisions and in evaluating the consequences of those decisions. Furthermore, by exploring the core leadership practice of HL, AL, and DL approaches (Heifetz & Grashow, 2009; Schein, 2018; Spillane, 2006), I can contribute effectively to GEO leadership capacity to enact a strategy plan for engaging students and faculty members with events that address the PoP.

People. The GEO Section is visible in the community thanks to its partnership with the local chapters of professional associations and local sponsors. All these partners constitute the GEO Section local network and help the organization develop activities that nurture and grow engineers' and students' knowledge and professional skills. However, the GEO network is unlikely to transform itself without the distribution of leadership roles (Lumby, 2013, 2019). As a section chair, I am the main driver for this OIP. However, I do not have the leadership capability to undertake and manage the whole process of change required to enable the GEO Section to develop or lead activities to solve the PoP issues presented in Chapter 1. The success of a change depends on support built with followers and other leaders. According to Harris (2013), leadership capability can be extended, meaning that an organization's members and partners have some leadership capacity that the network can use at some time. Nevertheless, I can influence the GEO Section to use its local network to advance GEO's existing efforts in bridging the gap between the organization and the local HEIs.

Formal Structure. According to Nadler and Tushman (1989), the formal structure refers to "the range of structure, processes, methods, and procedures that are formally developed to enable people to perform tasks consistent with organizational strategy" (p. 44). At the GEO Section, the formal structure has several elements that can empower leaders and followers to enact the OIP. The element of key importance for the OIP is the budgeting system.

As the section chair, I have the authority to request the GEO Section treasurer allocate or increase the budget for educational activities and lead a petition requesting additional funding from the GEO Canada Foundation to support applied learning projects to benefit the local community (American Chemical Society, n.d.-b, n.d.-f, n.d.-g). I also have access to management systems with data analysis tools to gather data regarding membership development. Furthermore, the formal structure encompasses a leadership program for potential volunteers and students, a virtual platform for collaboration and network, policies for creating a community of peers for students, and a mentorship program that can help the GEO Section connect students with the local professional community (OACETT, n.d.; OSPE, n.d.; PEO, n.d.).

Informal Structure. Nadler and Tushman (1980) noted formal structure reactions constitute an informal structure that may either aid or hinder the organization's performance. The informal arrangements are unwritten and reflect the culture of the organization (Schein & Schein, 2017). Therefore, I need to identify the current useful and dysfunctional unwritten norms (Schein & Schein, 2017). Schein and Schein (2017, 2018) pointed out that the unwritten norms or tacit assumptions cannot be discovered by objective processes or even understood from the outside through sense-based observation alone. According to Schein (2013), assumptions are best examined using HL, as its purpose is to help leaders to build an open and trusting relationship that enables stakeholders to share their thoughts and feelings and allows leaders to discover their next steps forward (Heifetz et al., 2009). I have an open and trusting relationship with the members of the GEO executive team and have found the following shared assumptions can affect the OIP:

- A consensus decision is preferable.
- Informal meeting over a meal to discuss problems and plan new activities is preferable.
- The team enjoys learning in a group by doing.

- The team is committed to ensuring equity and inclusivity in events promoted by GEO so that all students and professionals have opportunities regardless of backgrounds.
- The executive team emphasizes technical activities, although the GEO headquarters recognizes that nontechnical skills are essential and increase the organization's value, especially for young professionals and students.

The understanding of the benefits and risks of these informal arrangements has an impact on the GEO executive team's perceptions toward change. I strive to understand the GEO Section environment through the HL approach to make decisions that will impact change's transformational process.

Outputs

The focus of the OIP resonates with GEO headquarters' strategic priorities: connect local sections with HEIs connection by creating and maintaining a diversified portfolio of student-centred activities that follow the mission and vision of GEO described in Chapter 1. Consequently, the focus of the OIP resonates with two of GEO headquarters' strategic priorities.

The OIP will communicate and create opportunities for students to connect with a local section and explore various options such as seminars, symposiums, field trips (Blankenbuehler & Van Ness, 2018; Buckwalter & Sweeney, 2020; Cooper et al., 2018; Curfman et al., 2018; Watzky, 2018), engineering challenge (Dolan, 2013), and hackathons (Feder, 2021). The priority of this OIP, like the GEO headquarters' strategic plan, is to foster collaboration between the GEO Section and HEIs through the development of a safe psychological environment with a clear leadership structure defined by the AL, DL, and HL approaches discussed in this chapter.

The psychologically safe environment in which stakeholders (i.e., GEO Section executive board members, HEI administrators and faculty members) will establish social interactions enabling the GEO Section and HEIs to plan activities to benefit students considering their academic interests on their future career (Montes-González; 2016).

Although the OIP resonates with GEO headquarters' strategic priorities, stakeholders have widely different tasks, occupational backgrounds, and networks of social interaction. The stakeholders reflect different beliefs about the nature of reality, describing the gap between the GEO Section and HEIs (Hatch & Yanow, 2003; Mack, 2010; Pham, 2018). Consequently, the solution for the PoP will be constructed by assembling it from the minds of stakeholders through open communication (Schein, 2013) that the safe psychological environment will ensure. Thus, the stakeholders will make sense of their experiences and inform actions to develop student-centred events to bridge the gap between the GEO Section and HEIs and provide students with opportunities to foster their engineering skills following their academic and future professional career interest (Watzky, 2018; Wright & Keirstead, 2018).

Lastly, the OIP is aligned with the GEO's mission and vision that focuses on diversity, inclusion, and collaboration by removing obstacles and providing GEO members with financial incentives (American Chemical Society, n.d.-b, n.d.-f, n.d.-g) for accessing opportunities to face real-world challenges (Dolan, 2013; Engineers Canada, n.d.; Pericles, 2020). For these priorities to be met at the GEO Section level, I need to continue with the openness and readiness for change but direct them toward the gap outlined in the PoP using a process of collaboration with students and faculty members who are deeply committed to embracing the GEO's mission and vision.

Changes Needed

I have identified three key learnings from applying Nadler and Tushman's (1989) organizational congruence model to the GEO Section. First, there is a lack of communication between the GEO Section and HEIs. Presently, the organization does not have leaders engaged with HEIs, especially a counsellor who could be in close contact with students, faculty members, and HEI administrators to discuss ideas to improve educational activities developed by the GEO Section.

Second, there is misalignment between the annual action plan of the GEO Section and the strategic plan of the HEIs (College Faculty Board, personal communication, October 23, 2020). As a result, the events promoted by the GEO Section focus on promoting events for professional engineers and students from secondary schools. Currently, there is no participation of students, faculty members, and administrators from HEIs in the aspects of the GEO Section annual plan that encompass educational activities such as the engineering symposium, engineering challenges, and regional science fair.

Finally, there is a lack of clear directions and guidelines to engage prospective leaders including students and faculty members in several leadership roles available such as educational counsellor and industrial officer. Presently, GEO leader's recruitment efforts are relying mostly on word-of-mouth. Presently, most of the GEO Section senior members and prospective leaders are from HEIs. However, they are not receiving directions to attend the GEO leadership program or clarifications about vacant leader roles.

Overall, there is a lack of collaboration between the GEO Section and HEIs. Therefore, changes are needed to increase the GEO Section's agility and leadership capacity to reach its full potential to communicate, engage, and collaborate with HEIs. Hence, the next section will examine workable solutions that the GEO Section can adopt to improve and extend its leadership capability and mobilize available resources to orchestrate and support this OIP.

Possible Solutions to Address the Problem of Practice

I believe that the GEO Section executive team, faculty members, and HEI administrators interpret the gap between HEIs and the GEO Section differently. Consequently, it is essential to find a solution where stakeholders interact openly and fairly with others to determine the most effective solution to overcome the gap between the GEO Section and HEIs. The solution should secure a sustainable and psychologically safe environment in which the collaboration between the GEO Section and HEIs can result in stable activities (e.g., engineering challenges and hackathons) suitable for HEIs and well-aligned with the GEO's mission and vision. In this

realm, humble leadership (HL; Shein & Schein, 2013), adaptive leadership (AL; Heifetz et al., 2009) and distributed leadership (L; Spillane, 2006) approaches will be imperative. The approaches will allow observations, foster open communication, generate Intense interactions resulting in the commitment of faculty members, provost, dean, chair, and right students for leadership positions to construct a master plan with a shared vision, well-thought-out objectives and goals towards the selection and adjustments of activities aligned with the interest of HEIs and GEO's mission.

As Cooper et al. (2018) highlighted, "The need for strong student leadership should not be underestimated" (p. 59). Thus, for this OIP, an optimal solution should consider students who are prospective leaders, responsible and high academic achievers to ensure the development of student-centred activities.

In summary, the solution to satisfy the PoP should trigger collaboration between the GEO Section and HEIs and focus on the interaction of stakeholders and forming meaning through these exchanges (Creswell, 2014).

To conduct the changes needed to implement the future vision for the GEO Section, the proposed OIP highlights the following potential solutions:

- Solution 1: Initiate incremental change.
- Solution 2: Expand the executive group with an aim to develop new activities that focus on students and young professionals.
- Solution 3: Create a student-run society or a subsection for students to develop extracurricular activities that foster collaboration among students, faculty members, and the GEO Section executive team.

The solutions are based on DL, AL, open communication, and are congruent with the interpretivist paradigm (Pham, 2018; Schwandt, 2000), because I am building meaning through observations and open conversations with students, faculty members, and administration, especially provost, dean, and chair. Inspired by the assessment method plan-do-study-act cycle

(Christoff, 2018; Murray, 2018; Taylor et al., 2014), each solution will be cyclical, adaptive, and oriented toward continuous improvement considering return on investment indicators or return on expectation. Although the solution's implementation is divided into phases, the process is nonlinear, with phases overlapped. Furthermore, the solutions are designed to use the GEO Section executive board's wisdom and to touch people's deeply held values to prevent unethical behaviour.

Solution 1: Initiate Incremental Change

The first proposed solution is to introduce slight changes in a few current events to centre them on activities that can benefit HEIs, especially students. As section chair, I will be the main change driver, and I will rely on the GEO Section executive board's support. Three annual events, GEO Day, the engineering challenge (Engineers Canada, n.d.), and the engineering symposium, can be slightly changed with no risk of disturbing the executive group by increasing learning anxiety (Schein & Schein, 2019).

GEO Day is an event for members to gather and share technical ideas. As the section chair, I propose the GEO executive board extend the event by inviting local HEI students and faculty members to network and create opportunities to foster collaboration between HEIs and the GEO Section.

The engineering challenge (Dolan, 2013; Engineers Canada, n.d.) is already organized and promoted by the GEO Section for secondary schools. I propose the GEO executive board extend this event to HEIs and include problem-based learning (PBL; Ceker & Ozdamli, 2016) to highlight knowledge application to real-world problems. PBL approaches are aligned with the strategic plan of the community HEIs (College Faculty Board, personal communication, October 23, 2020). As such, a small extension of the engineering challenge can bolster the collaboration between HEIs and the GEO Section.

Finally, the engineering symposium can be modified to fulfill the expectations of HEIs. Booth spaces for professional organizations (OACETT, n.d.; OSPE, n.d.; PEO, n.d.) and local

industries can be extended to HEIs. In addition, GEO can invite speakers for subjects relevant to students' and faculty members' interests.

The solution proposed does not require an expansion of the executive team. Since the solution requires few changes to existing events, the cost in time and effort is minimal. The planning and execution phases can be completed by the GEO executive team, including my role as section chair, in collaboration with GEO members and faculty members.

Time Allocation

The whole process from solution implementation to assessment of outcomes will take at least 2 years. This time is necessary for a complete adaptive cycle (Christoff, 2018; Murray, 2018), including planning, delivering, assessing, and making corrections based on learned lessons.

Technological and Human Resources

As mentioned in the "Force Field Analysis" section presented in Chapter 1, technology is one of the organization's greatest strengths. The GEO Section can develop a platform for HEIs to network, collaborate, and create online communities to debate ideas and organize events. Identifying the changes and adding them to the existing events will not require additional GEO Section resources.

Fiscal

The GEO Section will incur a minimal cost to extend the event to students. The GEO Section has budgeted funds for education; therefore, the events will be free for students. Costs can be further minimized if schools can host events at their facilities.

Advantages

The most significant benefit of this solution is that it can be quickly added to several existing current events. The incremental changes proposed in this solution can be implemented without altering the organization's basic leadership processes. The solution meets the goals of the OIP to the extent that it provides students with opportunities to interact with GEO members

by aligning current events, such as engineering challenge (Dolan, 2013) and hackathons (Feder, 2021), with HEIs' and GEO's strategic plans. Consequently, Solution 1 can create links between the GEO Section and HEIs through the interaction of students, faculty members, and the GEO Section executive board.

Disadvantages

The solution has some drawbacks. Events that can be easily adapted are offered annually. Therefore, there will not be continuous efforts addressing the PoP. Additionally, as section chair, I am at risk of becoming overloaded with work because I am the main driver for the solution. Thus, Solution 1 does not explore the DL approach that is essential to foster the collaboration that is central to the OIP. Consequently, Solution 1 does not prioritize the development of a clear leadership structure, including DL approach to bridge the gap between the GEO Section and HEIs. As a chair, I need to use DL to empower stakeholders and navigate the viewpoint differences of the stakeholders (i.e., students, faculty members, GEO executive team and HEIs administrators), which is crucial for taking responsibility and making decisions for the benefit of students.

Solution 2: Expand the GEO Section Executive Board

The second solution consists of increasing the GEO Section ties with HEIs through a DL process to include students' and faculty members' voices in the GEO Section executive board. GEO faculty and student members are prospective volunteers apt to take key leadership roles to empower the GEO Section and HEIs to enact joint events.

Furthermore, this solution addresses one of the most significant restraining forces of this OIP: the lack of volunteers to lead the organization to a more DL process. The DL approach will allow the GEO Section to respond faster to problems that cannot wait for my response, such as ethical issues (Carsten & Uhl-Bien, 2013; Shapiro & Gross, 2013). As part of a volunteer-driven nonprofit organization, the GEO Section pursues its goals and objectives by attracting new volunteers while retaining loyal volunteers. Hobbs (2011) articulated the importance of volunteers

by stating that the staff are like the organization's skeletal structure. The stakeholders are like the organs, the community is like the skin, and the volunteers are like the lifeblood-sharing efforts that nourish and make the organization vibrant (Hobbs, 2011).

Developing leadership based on the work of volunteers can be exceedingly challenging. Unlike for-profit organizations, leaders in nonprofit organizations lack paid rewards. In fact, nonprofit leaders often experience increased workloads, which may interfere with their paid employment (Catano et al., 2001). The core idea of this solution is to foster long-term commitment of GEO members working in HEIs and potential leaders to lead events that increase collaboration between the GEO Section and local HEIs.

I am the initiator and the main driver for implementing this solution. First, I will encourage interaction between the existing executive and prospective volunteers from HEIs to increase the GEO Section's inclusiveness. This will offer volunteers an opportunity to learn and accept the organization's values, norms, and rules (Schein & Schein, 2017). Second, I will invite prospective leaders to attend the GEO Volunteer Leadership Program; many graduates of this program have taken leadership positions across all organization levels. Third, I will present opportunities for prospective leaders that focus on educational and technological events (e.g., web seminars and hackathons). The critical step is to assign new leaders from HEIs as student counsellors (ideally faculty members active in the GEO Section), an industrial relations officer, and a membership development officer. Finally, a follow-up or debrief session will be held to troubleshoot, inquire, and collect data with an aim to update the original plan with the lessons learned (Markiewicz & Patrick, 2016; Patton et al., 2016).

Time Allocation

Since the changes are significant, it is difficult to estimate the time needed to implement the plan and assess the outcomes. It will take at least 3 months to reach out to prospective volunteers and integrate them into the organizing team. It will take at least 2 years to complete one cycle, including planning, monitoring, and evaluating the suggested solution.

Technological and Human Resources

As outlined for Solution 1, the activities can be developed through GEO's virtual platform. To create and provide student-centred events, the GEO Section will rely on volunteers from HEIs, especially GEO members who are students or faculty members.

Fiscal

The GEO Section will incur a high cost to extend the event to students. While the GEO Section has reserved funds for education, they are not enough to run a new activity for more than 3 years. Therefore, the events will depend on sponsorship from the local community.

Advantages

The second solution develops more student-centred activities, recognizes the prospective leaders spread across HEIs, engages students and faculty members in the decision-making process, ensures vitality for the GEO Section, reduces the executive team's workload, and fosters a DL process. Consequently, the solution meets the OIP and PoP to the extent that the gap between the GEO Section and HEIs is bridged, primarily because of the interaction of different stakeholders that can trigger collaboration towards the development of activities for the student benefits. Furthermore, the leadership team will consider that students interpret events differently, and their perspectives or viewpoints should be integrated into the initiative change (Creswell, 2014). Consequently, the solution is student-centred and meets the goal of PoP regarding the need to foster collaboration between the GEO Section and HEIs considering the student's voice (Huang & Peterson, 2017).

Disadvantages

The executives may resist the proposed solution because of the expenditure increases, primarily because of possible budget retractions imposed by the COVID-19 crises (Harris & Jones, 2020; Kuenzi et al., 2021). Although the solution meets the goal of OIP regarding collaboration between the GEO Section and HEIs, the change process to enact the solution will depend heavily on the GEO executive team, especially on myself as a chair, because there is no

process in place to ensure accountability with respect of potential volunteers from HEIs (Brouet, 2016; Sakaduski, 2013). Consequently, the decision-making process may suffer due to a lack of consistent coordination between leaders from the GEO Section and HEIs.

Solution 3: Create a Student-Run Society

The first step is to expand and foster a DL process. This step evokes Solution 2. The second step is to create a student-run society, an affinity group, or a student branch (Association for Computing Machinery, n.d., Buckwalter & Sweeney, 2020). The process of creating a student branch is well defined in the internal GEO policies (GEO Staff Member, personal communication, December 11, 2020), and outlined in articles about student chapters or associations (Cooper et al., 2018; Ledesma & Mellis, 2016; Swartling, 2016; White et al., 2016). To undertake this complex multiphase process, I will appoint a GEO faculty member as a counsellor, advisor or mentor (Fisher, 2016; Swartling, 2016) tasked with increasing student membership and launching a petition requesting support from faculty members and students to create a society. As is expected, the faculty counsellor is instrumental in developing the society to its utmost potential (Brouet, 2016) that guarantees a student-driven nature of the society, bridging the gap between the GEO Section and HEIs. Thus, the counsellor provides students with autonomy and decision-making power.

The third step is critical, focusing on forming an executive board and membership (Adams, 2016). The team will encompass leaders for the essential roles: chair, vice-chair, treasurer, and secretary (Emory & Raymond, 2016). The student society also has the public relations office responsible for maintaining the student website page and managing social media (Adams, 2016; Watzy, 2018). All the officers need to attend training sessions and follow all internal and external GEO policies and ethics codes. With close collaboration with the GEO Section executives, the students will set high-quality events beneficial for HEIs and aligned with GEO's mission. The student society will offer opportunities to network on a local level, organize seminars with speakers on professional subjects, participate in GEO conferences, submit

applications to various awards and scholarship programs supported by GEO, promote field trips to local industries, and publish newsletters.

The society will enable HEIs and the GEO Section to integrate efforts by aligning their strategic plans to promote activities for the benefit of students and faculty members such as conferences and technical visits. However, the work to develop a society is immense; it requires strong DL, including the main drivers that are the students who belong to the GEO Section.

Time Allocation

This solution will be more time-consuming because it requires time to mobilize students and faculty members to launch a petition to create the student society. The creation of a stable student-run society with positive outcomes and a solid succession plan will take 2 to 3 years to implement.

Technological and Human Resources

Similar to Solution 1, the activities can be developed through GEO's virtual platform. The student-run society can also access a myriad of tools (e.g., data analysis, publishing, website creation) designed for managing the GEO Section. The GEO Section will utilize human resources from HEIs. According to GEO policies, a student-run society requires a minimum of 10 members, including the leadership team with the chair, vice-chair, treasurer, and secretary.

Fiscal

The student society is not considered to be a burden on the GEO Section, especially in the long term, because the society can apply for funding from GEO Canadian Foundation or GEO headquarters. Additionally, the student-run society can obtain community sponsors.

Advantages

The literature review revealed various success stories about how effective a student-driven chapter or association is at creating strong bonds between a professional association and HEIs (Adams, 2016; Baldauff, 2016; Brouet, 2016; Cooper et al., 2018; Curfman et al., 2018; Fleming, 2016; Fultz & Smith, 2016; Golden & Lolinco, 2016; Ledesma & Mellis, 2016; Montes-

González; 2016; Swartling, 2016; Vander Pyl et al., 2016; Watzky, 2018; Wright & Keirstead, 2018). The stories provide valuable insights for my OIP and PoP, and I realized that student-run society is appealing to students because it offers a myriad of options leading them to become more socially responsible citizens. Consequently, Solution 3 fits perfectly the OIP because it has the power to address the PoP by bridging the gap between the GEO Section and the local HEIs via symbiotic relations between students, faculty members and the GEO Section executive board.

Solution 3 has several advantages. First, a student-run society connects local HEIs with the professional organization via a collaborative process between students, faculty members, and executives of the professional organization. The collaboration process within the student-run society allows the development of activities aligned with the strategic plans of HEIs and professional organization's mission and vision. The activities developed by a student society (e.g., engineering challenge, seminars, hackathons) encourage future engineers to become socially responsible citizens (Blankenbuehler & Van Ness, 2018), increase retention and recruitment of members (Cooper et al., 2018), bolster students' self-esteem and self-efficacy (Baldauff, 2016; Bandura, 2018; Brouet, 2016), arouse students' curiosity (Curfman et al., 2018; Vander Pyl et al., 2016), and promote ethical behaviour (Blankenbuehler & Van Ness, 2018).

Consequently, the student-run society will help me as a section chair to build trusting relationships with HEIs, which facilitates better communication, thereby, ensures collaboration among the leaders from the student society and the GEO executive team. As a result, Solution 3 addresses the PoP and is perfectly aligned with the OIP as well as with my theoretical frame (i.e., interpretivism) because the solution implies the creation of a psychological secure environment between HEIs and the GEO Section where stakeholders (i.e., students, faculty members and school administrators) can build meaning through observation, open communication and understanding that people bring to a change process different interpretations and opinions (Ryan, 2018).

Last, as discussed in Chapter 1 in the PEST analysis, the GEO has diverse financial resources (e.g., scholarships, funding for social events and technical projects) destinated to universities and colleges. The student run-society fits in the category of student branch (Buckwalter & Sweeney, 2020). Thus, the GEO Section via Solution 3 can tap financial resources from GEO headquarters and GEO Canadian foundation.

Disadvantages

Creating a student-run society requires the dedicated involvement of the GEO executive team, faculty members, and students. The success of a student chapter depends on the strong leadership skills of faculty members and students who are running the society (Swartling, 2016). The faculty counsellor should have solid leadership skills to keep the student society stable by engaging dedicated and knowledgeable student leaders (Adams, 2016) to be part of the student executive board. Furthermore, the time required to keep the student society in good standing can be draining, and coursework may interfere (Fleming, 2016) with the planning and management of the society.

The GEO Section executive team may impose some resistance because of the initial funding for covering expenses with meetings and the considerable time needed to implement the solution. Therefore, I must determine losses and predict defensive patterns of stakeholders' responses to undermine this OIP. Resistance to change is discussed further in Chapter 3.

Solution Chosen to Address the Problem of Practice

When comparing the proposed solutions, benefits and drawbacks can be further examined. Table 2 presents a comparison of the three proposed solutions. Solution 3 offers the most outstanding advantages, including benefits, the collaboration between local HEIs and the GEO Section, and efficacy.

Solution 3 is the most desirable and resonates with the goals of the OIP because it provides a means for the GEO Section and HEIs to develop strong collaboration and create a student society that works as an anchor between GEO and local HEIs. Although Solution 3

depends on the commitment of students and faculty members with strong leadership competencies, it is promising due to the excitement around the power of the student society to develop activities that positively impact the academic and the future life of students. A student society can be a journey of enthusiasm and passion (Montes-González, 2016).

Implementing a prosperous student society depends on crucial components, including membership number (Brouet, 2016; White et al., 2016), the enthusiasm of the student society executive board (Wright & Keirstead, 2018), and financial support (Emory & Raymond, 2016). The concerns about recruiting passionate students (Fleming, 2016) and having long-term financial support can be addressed using strategies that make students realize the benefit of spending their time in the student society (Baldauff, 2016). In this OIP, the recruitment concern will be handled with a strong leadership team, the proposal of appropriate financial incentives (e. g. scholarships), and suggestions about impactful activities such as hackathons (Feder, 2021) that make students realize the benefit of spending their time in the student society (Blankenbuehler & Van Ness, 2018; Vander Pyl et al., 2016).

Table 2

Comparison of Solutions

Aspects of Solution	Solution 1: Initiate Incremental Change	Solution 2: Expand of the GEO Section Executive Board	Solution 3: Create a Student-Run Society
Resources Needed	Least	Moderate	Greatest
Time	Least	Moderate	Greatest
Benefits	Least	Moderate	Greatest
Collaboration between HEIs and GEO	Lowest	Moderate	Greatest
Executive Team Acceptance	Greatest	Least	Moderate
Inclusiveness	Least	Moderate	Greatest
Addresses the Problem	Least	Moderate	Greatest

Note. GEO = Global Engineering Organization; HEIs = Higher Educational Institutions.

The student society will enable the change agents (Deszca et al., 2020) to engage in open dialogue with all stakeholders and obtain different interpretations regarding the students' activities the GEO Section can enact to bridge the gap between the section and HEIs. The society will develop student events informed by students' interactions with faculty members, HEIs administrators and the GEO. This realm reflects the proposition that there are multiple realities because of stakeholder's different perceptions (Pham, 2018). Consequently, the student-run society creates an optimal learning environment in which students, faculty members, and the GEO Section executive team can converge to address the PoP.

The solution also provides leaders and stakeholders with a deeper understanding of the OIP and its complexity in its unique context instead of generalizing it through simplified or general concepts (Creswell, 2014).

The Plan-Do-Study-Act Cycle

This OIP uses a continuous improvement framework based on plan-do-study-act (PDSA) cycle (Bernhardt, 2018). The improvement framework encourages small incremental changes.

As such, the PDSA cycle resonates with AL, which is an iterative process encompassing three key activities: observe, interpret, and intervene (Heifetz et al., 2009).

Plan. The planning stage addresses the questions: "Where are we now? How did we get to where we are? Where do we want to be? How are we going to get where we want to be?" (Bernhardt, 2018, p. 19). The GEO Section has yet to plan a student-run society. The "Organizational Change Readiness" section in Chapter 1 shed light on a limitation in the organization's leadership capacity to address the PoP. The creation of a shared vision and the communication of the chosen solution will trigger the process to overcome this limitation and address the PoP. In this process, the HL model will be explored to further foster open and trusting communication existing in the GEO Section. Using a decision-making process based on consensus, the organization can focus on the extension of the GEO Section leadership capacity to enact the chosen centred-student solution to address the PoP.

Do. The implementation of the OIP addresses the question, "How are we going to implement?" (Bernhardt, 2018, p. 19). First, the GEO Section will strive to establish a DL framework through which GEO members, who are faculty members and students, will share information that can be used to determine a process of collaboration between the GEO Section and HEIs. The GEO Section, with the collaboration of prospective leaders from the HEIs, can start the process of understanding how to create a student-run society and how to empower the organizing team through the GEO Leadership Program and the technology available.

Study. The study phase requires answering the question, "Is what we are doing making a difference?" (Bernhardt, 2018, p. 19). The evaluation will depend on a comprehensive data analysis highlighting important indicators that show the transformation brought by the student-run society in terms of student engagement with the events promoted by the GEO Section. The progress of the student-run society against identified key performance indicators will be defined for the process of monitoring and evaluation that will be described in Chapter 3. The impact of the student-run society can be determined by exploring the three steps of the AL approach.

First, it is important to observe what is happening in terms of the interaction between the GEO Section, the student-run society, and the HEIs. Second, it is essential to interpret or evaluate the type of transformation based on the indicators. I will encourage collaboration across the triad, the GEO Section, the student-run society, and HEIs so that an effective evaluation occurs, considering different stakeholders' perspectives. Third, at the end of the implementation, the intervention will take place to re-evaluate the process using the GEO tools for monitoring and evaluation, interviews, and feedback from stakeholders.

Act. The evaluation phase requires answering the question, "How can we keep doing the things that make a difference?" (Bernhardt, 2018, p. 19). At this stage, the leading team, including me, as section chair, the chair of the student-run society, and the faculty member acting as student counsellor, need to reflect on the meaning of data collected, come to a consensus in terms of lessons learned during the process, and determine what must be done to move forward in the continuous process of improvement.

In summary, three possible solutions for this OIP were presented. Each of these solutions were discussed based on the human, financial, time and technology resources. The advantages and disadvantages were also reviewed. I conclude that the Solution 3, creating a student-run society, is the optimal solution because it involves all stakeholders, especially students, faculty members, and executives of the GEO Section, in developing events aligned with the strategic plans of HEIs and GEO. The chosen solution requires more financial and human resources; however, the adopted leadership approaches HL, AL, and DL integrated with the interpretivism described in Chapter 1 will facilitate the change initiative by fostering open communication, extending leadership capacity to handle the adaptive challenge, and assimilating different perspectives of change leaders and change recipients. In any change initiative, leaders will be expected to make decisions that would serve others and not their personal interests. Next Section, I will present the ethical decision-making process essential to enact an effective collaboration between HEIs and the GEO Section.

Leadership Ethics and Organizational Change

In their daily lives, people face questions about "right, wrong, good, evil, virtue, duty, obligation, rights, justice, fairness, and responsibility in human relationships with each other and living things" (Ciulla, 2014, p. 4). All these questions have led me to reflect on my core values. I consider trust to be an essential ethical value. "Without trust, there is no cooperation, no community, no commerce, no conversation" (Solomon, 2014, p. 117). My personal approaches align with Woodson et al. (2019) views, as I also believe responsible leadership and care for others are the essence of ethical behaviour.

The OIP considers that the GEO Section and HEIs have people of diverse occupational and cultural background. My ethical approach will handle diversity by underlining care to others regardless of their different perspectives or characteristics of background (Shapiro et al., 2014). The student society will be essential in promoting care because it works as an inclusive and respectful learning environment in which students, with empathy (Haiyan & Walker, 2014) and caring (Kuusilehto, 2014), will collaborate with faculty members, HEI administrators, and the GEO executive team to nourish and sustain a secure environment and overcome the gap addressed by the PoP.

My commitment to ethics starts with reflections based on moral questions posed by Gini and Green (2014): Do we do the right thing for our community, including our members and volunteers? Do we do it in the right way? Moreover, do we do it for the right reason? What ought to be done about others? I have the responsibility to reflect on these questions because there is a strong codependency between ethics and the implementation of the solution to address the OIP, which depends heavily on how much members and other stakeholders trust my integrity and that of other leaders engaged in the process of change (Sharif & Scandura, 2014). Thus, the ethical reflexive questions will be integrated in each step of the PDSA cycle (Bernhardt, 2018) and each stage of the adopted change model (Schein & Schein, 2017).

In the context of organizational change, people are shifted from their comfort zone into a place or context that is constantly changing in unpredictable ways. Unfortunately, some may try to overcome uncomfortable situations by violating moral values, resulting in ethical lapses or breakdowns (Carsten & Uhl-Bien, 2013). Changes can also trigger destructive leader behaviours, producing tensions that lead to emotional exhaustion, resistance behaviour, and deviant work behaviour. As such, I propose implementing an ethical decision-making process that integrates the following perspectives: professionalism, observation, transparency, and interference. The last two perspectives are intrinsically linked with the AL process that encompasses observations, interpretations, and interventions. These perspectives can coexist and help to highlight possible ethical issues and potential ways to mitigate them.

Professionalism

As mentioned in Chapter 1, my organization has an ethical code that addresses societal implications of technology, conflict of interest, unlawful conduct in professional activities, discrimination, health, whistleblowing, safety, confidentiality, risk, and welfare of the public (GEO Staff Member, personal communication, December 11, 2020). At the GEO Section, specialized training programs that help raise organizational awareness of ethical issues are provided to followers and leaders.

A code of ethics is necessary because it enhances the profession's reputation and public trust, creates a climate in which unethical reporting behaviour is affirmed, guides behaviour to improve decision making (Pynes, 2011), and provides support for members faced with pressures to behave in a corrupt manner. The GEO Section strives to follow its ethical code, but it does not try to change behaviour by imposing the code of ethics. Scholars stated ethics codes are necessary but not enough to affect the decision-making process or individuals' beliefs (Burnes, 2009). Consequently, the attempt to change behaviour by imposing an ethical code is an over optimistic attitude. It is possible that the problem is not with the codes but with the level of expectation regarding moral decision making (Ciulla, 2014). Thus, I go beyond the GEO's code

of ethics to integrate professionalism with other ethical considerations, including the shared moral values: freedom, trustworthiness, respect, loyalty, responsibility, fairness, and caring (Tuana, 2014).

Observation

It is possible to detect the potential risk of an ethical incident by observing subtle signs of resistance (Burnes, 2009). By observing and listening, leaders can detect indicators of adaptive issues representing a danger for the organization. This process is depicted by the metaphor "listen to the song beneath the words … [by] taking a balcony perspective" (Heifetz & Linksy, 2002, p. 65). In this way, leaders can understand followers' perspectives and reflect on a situational challenge before reacting.

According to Schein and Schein (2017, 2019), it is essential to pay attention to followers' survival or learning anxiety and how the process of change affects them. Schein and Schein (2017, 2019) stressed the need for change leaders to guard against reacting solely to followers' behaviours and asserted they must remember the underlying anxiety is a powerful force motivating the resistance. The force encompasses fears of losing power, incompetence, punishment because of incompetence, loss of identity, and loss of group membership. The fears produce four types or signs of behavioural manifestations of resistance to change: denial, blame, maneuvering and bargaining, and sabotaging (Schein & Schein, 2017, 2019). The first is the result of learning anxiety (Schein & Schein, 2017, 2019). People may feel that they will not be able to adapt to the new situation. The second is about blaming others for the disconfirming data (Schein & Schein, 2017, 2019). The fourth is about the danger that people can subvert a change imitative due to loss of engagement (Schein & Schein, 2017, 2019).

As Lewis (2019) highlighted, "Signs of resistance may be signals that the change has flaws or needs adjustment so that it can be used in a successful way" (pp. 149–150). The signs detected can enlighten leaders to react by embracing moral values and creating channels to open dialogue as in HL. I believe that open communication will encourage the change drives of this

OIP to expose signs of unethical situations openly. At the GEO Section, HL can be used to explore open communication leading the inquiry to shared assumptions affecting the process of change negatively.

Intervention

In this OIP, leaders from the GEO Section will be working in a team with people of different occupational and national backgrounds. In this complex realm, the practice of AL can cause distress and raise ethical questions. Accordingly, Heifetz et al. (2009), some people like to cause others pain, and some people do not like to be pushed outside their comfort zone because they do not want to violate their espoused values such as respect and honesty.

Intervention is intrinsically connected with the AL process adopted to address the PoP. I will intervene using an ethical lens focusing on equality, justice, respect, and integrity. In the interventions, I will search for internal psychological roadblocks, possible ethical issues, and ways to cope with uncertainties due to planned events aiming to bridge the gap between HEIs and the GEO Section. Unfortunately, we cannot know when an adaptive change will make people uncomfortable and prone to damage others or their sense of right or wrong.

In intervention, it is imperative to consider ethics as a dynamic enterprise that requires continuous reassessment with a process of inquiry underlying the following questions: “Do the means justify the ends in this instance? What data am I using to evaluate the consequences? How will these short-term decisions generate long-term consequences?”(Heifetz et al., 2009, p. 235). By keeping my mind open to these questions and reflecting on the ethical issues of care, professionalism, critique, and justice, it is possible to mitigate the risk of making regrettable decisions.

Transparency

A culture of adhering to ethical requirements creates a work climate characterized by mutual respect. In these environments, leaders openly share information and show high personal moral standards by providing followers with the rationale and benefits for their ethical

behaviours. When leaders encourage members to speak up, followers' opinions are likely to be respected and valued by ethical leaders (Huang & Paterson, 2017). Transparency can foster open communication and challenge ethical lapses by disclosing and informing leaders and followers of potential moral catastrophes before they occur. The transparency in a change team works as a protective mechanism because it helps people to stay abreast of potential ethical problems and introduces mediating mechanisms that address possible unethical conduct. In this way, leaders and followers can foster a work climate characterized by mutual respect in which people are comfortable expressing their differences. Thus, leaders are pivotal for removing the constraints that often discourage followers from expressing their concerns and other ideas. Besides, transparency prevents a single group member from being the primary target of negative responses and can create an environment in which agreement on ethical issues is likely to be reached.

The solution to address the OIP will distribute the leadership process to increase transparency by giving students and faculty members power to participate in the decision-making process to create events to bridge the gap between HEIs and the GEO Section. As noted in Chapter 1, DL can make actions more transparent resulting in leaders feeling more vulnerable if there is a lack of honesty and virtuosity (Liu, 2017). I believe that the open communication and transparency among the student counsellor, student society chair, and me (in my role as section chair) are of paramount importance to trigger the benefices of a DL process, including the increase of trust and cohesion, the decrease of socioemotional conflicts, and the increase of equity and inclusion. As a result, I will foster teamwork, collaboration, and open communication between the GEO and HEIs.

Potential OIP Ethical Issues

For this OIP, I consider two potential ethical issues or incidents. First, my PoP involves stakeholders of several occupational backgrounds supported by different codes of ethics (Irland, 2019; Kristinsson, 2014; Shapiro & Gross, 2013). Consequently, clashes between an individual's

personal and GEO code of ethics can happen (Cranston et al., 2014). My OIP will mitigate the potential issue by using DL approach to ensure stakeholders involved in the change initiative feel as if they are heard and of worth.

The second potential issue is related to the complexity of events—the OIP will trigger many events such as meetings, consultations, monitoring students' activities toward the development of their society, record-keeping about expenditures, and access to personal data such as occupation, contact information. In this realm, unethical behaviour is sometimes a subjective call (Branson, 2014; Shapiro & Gross, 2013). The OIP will mitigate the issue by adopting DL to trigger community involvement, interventions and observations promoted by the AL and open communication via HL, which will help stakeholders reach consensus regarding the right course of action.

Chapter Summary

This chapter has identified the leadership framework that can enable change by creating psychological safety, favouring open communication, and increasing leadership capacity and readiness for facing adaptive challenges. An in-depth evaluation of three workable solutions for the PoP is presented. The solution recommended within this chapter is developing a student-run society through the cooperation between the GEO Section and HEIs. The leadership framework and Schein's change model (Schein & Schein, 2017) can be used together to provide an effective process to advance this change initiative. Finally, this chapter evaluated ethical issues that may constitute an obstacle to a change initiative. Chapter 3 will provide the specific plans for implementing the chosen solution, communication of the need for change, and monitoring and evaluating the change process.

Chapter 3: Implementation, Evaluation, and Communication

This final chapter outlines the implementation, evaluation, and communication of this change initiative to enact the recommended solution proposed in the previous chapter. The proposed solution is based on creating a student-run society (i.e., GEO student chapter) to develop a strong link between HEIs and the GEO Section. The beginning of this chapter describes the goals and priorities necessary to move forward with the change plan. This chapter provides the implementation plan integrated with Schein's sociopsychological model of change (Schein & Schein, 2017) and outlines a plan for managing the transitions underlining the stakeholders' reactions to change, resources, strategies to build momentum, and potential issues. It also explores monitoring and evaluation strategies that will be applied during the change process. The chapter ends with the communication plan based on the four phases model developed by Deszca et al. (2020) to communicate through the change process. To conclude, the next steps are addressed and future considerations are presented.

Change Implementation Plan

Careful planning is essential, but change agents must recognize that planning is not the end but a means (Deszca et al., 2020). The change plan is not an event; it is an iterative process (Kotter, 2012, 2014a). As indicated in Chapter 2, the proposed solution is expected to take 3 years. However, it may require more time because of the community's unpredictable changes. Thus, knowledge about implementing appropriate organizational changes is critical for this OIP.

The change plan will promote participatory events by considering stakeholders' perspectives and concerns. Using the interpretivist lens mentioned in Chapter 1, multiple perspectives and individual experiences will be considered. The plan is also to promote intervention through the AL approach (Heifetz et al., 2009). A system can only be understood through intervention processes in which change agents learn from essential data about how the organization system works (Schein, 2016; Schein & Schein, 2009, 2018). Moreover, the

intervention can mitigate change resistance and increase opportunities for prospective leaders to endorse the changes.

Priorities and Goal

The goals of the change implementation plan are to build a leadership coalition between the GEO Section and local HEIs, create the GEO Student Society (GEOSS), a group of students with shared goals or a student-run society (Adams, 2016; American Chemical Society; n.d.-a; Association for Computing Machinery, n.d.; Watzky, 2018) to reinforce the collaboration between the GEO Section and HEIs toward the development of diversified educational activities, based on students' career objectives and interests, including engineering challenges, innovation and technology showcase, hackathons (Feder, 2021), science fair, and interdisciplinary webinars (American Chemical Society, n.d.-c; Curfman et al., 2018; Fultz & Smith, 2016; Swartling, 2016; Wright & Keirstead, 2018). The goals will be accomplished by moving forward the change initiative considering three critical priorities within my purview:

- Extend the GEO Section's leadership capacity by forming a coalition (Kotter, 2014a; White et al., 2016). The coalition will encompass GEO members of various occupational backgrounds, including students, faculty members, and volunteers from the GEO Section who will be the educational liaisons between HEIs and GEO Section.
- Enhance the communication between HEIs and the GEO Section by building an organic system (Emory & Raymond, 2016). The organic system has fewer rules, greater participation, and a highly decentralized decision-making process (Deszca et al., 2020; Kotter, 2014a) that will favour the use of DL (Spillane, 2006). In this OIP, the organic system is an informal network formed by two separated teams: the guiding coalition (GC) and the GEOSS, which will deal with the design and implementation of events (Emory & Raymond, 2016; Montes-González, 2016) to bridge the gap between HEIs and the GEO.

- Establish a consultation process to determine the activities aligned with the GEO and HEIs' strategic plans that foster a collaborative and inclusive environment (Montes-González, 2016) open to initiatives that link students to activities supported by the GEO Section.

Long-term goals require multiple steps over an extended period. Therefore, it is important to create short-, medium-, and long-term goals, as shown in Table 3.

As a Section Chair and change initiator, I will be deeply involved in the short-term goals. First, I will present the change implementation plan to the GEO executives, facilitate brainstorming sessions to identify early adopters and resistors (Kotter, 2012), and adjust the first planning draft to reflect feedback from the GEO Section executive team.

Table 3

Short-, Medium-, and Long-Term Goals

Short-Term Goals	Medium-Term Goals	Long-Term Goals
Present the change implementation plan to the GEO executives	Create the Guiding Coalition(GC) with members from GEO Section and HEIs	Create the GEOSS
Identify early adopters and resistors using face-to-face communication	Establish a Communication Team for the GC	Assign the GEOSS executive team to attend GEO leadership training
Facilitate brainstorming sessions to refine the plan	Disseminate messages clarifying the plan to create a student society	Connect students with existing activities promoted by the GEO Section (engineering challenge, local symposium, and technical visits)
Adjust the plan if needed using feedback from the GEO executive team	Promote surveys and collect feedback about the change initiative	Establish a student award fund and define resources for scholarships
Disseminate the plan to faculty members, HEI administrators, and students	Launch the petition to create the student society	Establish a Succession Planning for GEOSS with support of the GC and the GEO Section

Note. GC = Guiding Coalition; GEO = Global Engineering Organization; GEOSS = Global Engineering Organization Student Society; HEI = Higher Educational Institutions.

After disseminating the plan to faculty members, HEI administrators, and students, the focus will be on medium-term goals, especially the development of the GC, which will provide the focus and direction to students and faculty members to engage in this OIP and sustain momentum as the change process continuously evolves to launch the petition to create the GEOSS.

The long-term goals will focus on linking students to events promoted by the GEO Section and bringing resources from the GEO Section and GEO Foundation, including financial aid in the form of awards and scholarships (American Chemical Society, n.d.-b, n.d.-f, n.d.-g). As Morrison et al. (2019) stated, true collaboration requires joint efforts to align resources to enhance one another's capacity to reach a mutual benefit.

Change Implementation Phases

The planning process is divided into phases. However, the phases do not define a discrete and linear process. In a planned organizational change, more than one phase may co-occur; that is, the phases are not temporally mutually exclusive (Burke, 2018). To advance the change implementation plan, I consider the following essential phases based on the goals and priorities:

1. Build momentum for change through the increase of a sense of urgency (Kotter, 2008).
2. Create the GC to act as a self-regulating team to facilitate the change process by planning the GEOSS (Cooper et al., 2018; Emory & Raymond, 2016; Ledesma & Mellis; Swartling, 2016).
3. Create the GEOSS (American Chemical Society, n.d.-a; Association for Computing Machinery, n.d.).
4. Celebrate the change and internalize the feedback (Deszca et al., 2020; Kotter & Cohen, 2002; White et al., 2016).

As shown in the table of Appendix D, the first phase of change correlates with the first stage of Schein's change model (Schein & Schein, 2017). In this phase, I will use HL to establish open communication with GEO members, especially students and faculty members, and the GEO executive team to review change readiness. Through a consultation process, I will seek quality data to present to the GEO executive team to increase their awareness of this OIP. I will clearly articulate what needs to change, show the plan's alignment with the vision and mission of GEO, identify earlier adopters and resistors (Kotter, 2012). Furthermore, I will ensure that the goal and priorities of the plan are well understood and create a shared vision for this change initiative by facilitating biweekly meetings. Through a consultation process, I will seek quality data using observations and semistructured interviews (Schein, 2013) to determine how the GEO executive team, students, faculty members, and administrator within HEIs feel about the gap between the GEO Section and HEIs. As such, I strive to understand reality from the perspectives of people within it (Creswell, 2014; Ryan, 2018).

The second phase of change correlates with the second stage of Schein's change model (Schein & Schein, 2017), which is about learning new concepts and changing (see Appendix D). The essence of this phase is on the development of the GC. With the support of the GEO executive team, I will meet with crucial stakeholders from HEIs, including GEO members, and propose creating the GC that encompasses a communication team. I will present details about the GC in the section Managing the Transition. With the GC in place, I will be advocating for the appointment of leaders from HEIs and ensuring that students' and faculty members' perspectives are represented in the plan to ensure equity and inclusion of stakeholders regardless their backgrounds. Through the mobilization created by the GC, I can properly outline the process to create the GEOSS (Cooper et al., 2018; Fisher, 2016; Swartling, 2016; White et al., 2016).

The third phase of change correlates also with the second stage of Schein's change model (see Appendix D), the GEOSS is proposed as a holding environment to foster the

communication between the GEO Section and the HEIs. I will seek feedback from the stakeholders and elaborate with the GC's support a petition to create the GEOSS. This petition will be sent to the GEO headquarters, and once approved, the GC will receive the resources and funds for creating the GEOSS, as described in Chapter 1. As the GEO Section chair, I will link the GEOSS with the current activities of the GEO Section, especially the GEO Day, technical visits, the engineering challenger, the engineering symposium, and the AGM (American Chemical Society, n.d.-c; Emory & Raymond, 2016).

The last phase of change correlates with the third stage of Schein's change model (Schein & Schein, 2017), which is about celebrating and internalizing the change. I will mobilize the GEO Section, the GEOSS, the GC to reach out to the local community to celebrate the success of GEOSS. In addition, the communication, monitoring, and evaluation processes, explained in the following sections, will help the GEO Section, the GEOSS, and the GC internalize new lessons that will be essential to improve and maintain the GEOSS (Emory & Raymond, 2016). Celebrations are also distributed along the entire change process. There will be celebrations for the creation of the GC and GEOSS. Furthermore, no matter how small the successes or wins are, I will promote celebrations because a team lacking success is stagnant (Duck, 2001).

The planning process is designed to be transparent and highly participative given key roles and responsibilities to adopters from HEIs and the GEO Section. As shown in column 4 of the table in Appendix D, stakeholders will have responsibilities including approval of action (A), support (S) for action, and inform (I) before action. As section chair, I will be deeply involved in communicating the need for change, developing the first draft of the change plan, mobilizing change leaders, facilitating meetings, and identifying people to form the GC. For other actions, I will "get on the balcony" (Heifetz, 1994, p. 126) or stay away and observe the GEO Section to reflect and better understand patterns and identify the best path to move forward. As an adaptive leader, I need to observe, learn, regulate distress, and support others in focusing on the actions.

Moreover, the actions described in the table in Appendix D will be split into several tasks. Afterwards, a sequence of virtual meetings will happen to plan, execute, and evaluate each set of tasks until all planned actions are completed. As one of the planners, I will identify when the change initiative should be completed and work backward from that point, scheduling all tasks. To ensure that the defined priorities are met in a short period of time, I will also adopt the critical path method (Andrews et al., 2019). This technique is implemented in one of the GEO Software tools used to monitor and control the timetable for each set of tasks or work breakdown. The critical path method will provide detailed scheduling information and introduce the parallel initiative concept (Deszca et al., 2020). This concept recognizes that different tasks can be performed simultaneously, resulting in better use of the available time.

The next section outlines the managing transition that includes tactics for composing an informal network of leaders, the GC, to engage stakeholders and secure resources for implementing the described actions.

Managing the transition

This section addresses stakeholder reactions when they face changes, determine essential resources and support, show tactics to increase the stakeholders' excitement during the change process, and identify potential implementation issues.

Assessment of Stakeholders' Reactions. How people react to change profoundly impacts the ultimate success or failure of that change initiative (McCann, 2009). Some individuals embrace change wholeheartedly, while others are ambivalent, view change negatively, and resist change efforts because of their ingrained assumptions about "how we do things here" (Kotter & Rathgeber, 2016, p. 129). Thus, it is critical for the change agents engaging in this OIP to explore their tacit assumptions and check their biases.

As a leader, I must be vigilant in determining when I elect to stay away and observe versus when I move to the "dancefloor" (Heifetz, 1994, p. 7) to implement interventions so that the reactions to the proposed solution can be determined. It is also essential to have strategies

for coping with change. When people feel powerless, various negative coping responses surface, including work avoidance, alienation, passivity, absenteeism, turnover, sabotage (Deszca et al., 2020; Feldmann, 2014), and cynicism (Thundiyil et al., 2015).

As mentioned in Chapter 1, the GEO Section executives have been organizing successful technical events in the local community for the last 20 years. Moving forward to promote the events required for enacting this OIP can trigger survival and learning anxieties. Schein and Schein (2017) argued these two kinds of anxieties can occur sequentially or concomitantly. They noted five fears arise from the two anxieties: loss of power, incompetence, punishment, loss of personal identity, and group membership loss (Schein & Schein, 2017). To cope with the anxieties and fears of the change agents and students who are the change recipients, I will (a) use data to facilitate the decision-making process, (b) adopt HL to foster open and trusting communication, and (c) use the DL to empower stakeholders to contribute to the change process.

How stakeholders perceive change will depend upon their assessment of the situation. Therefore, I will provide essential information to clarify the vision for change, the desired state, and the gap between the current and desired states determined in the previous chapter using Nadler and Tushman's (1980) congruence model. Clear communication will help the executives of the GEO Section to mitigate learning anxiety and collect qualitative data to foster empathetic understanding amongst stakeholders about the meaning and motives (Creswell, 2014) behind the lack of collaboration between the GEO Section and HEIs. As such, I will further discuss the communication topic in the section about the plan to communicate the change process.

As the section chair and change leader initiator, I need to understand why people react to change negatively. I will use the HL process to foster trust and open communication (Schein, 2013, 2016). The HL approach will be essential for creating an inquiry process (Schein, 2013) to help me understand what can motivate the GEO executives to embrace the change process and gain insights about how to convert resistors into allies so that there is no reason "to hire a new

crew at great expense. Existing people provide the energy" (Kotter, 2014b, p. 11). Moreover, through HL, I can establish relationships to enable executives to learn together. Consequently, executives will be more confident about the change process, more open in their communication, and, in turn, better prepared to face surprises that arise in the process of change.

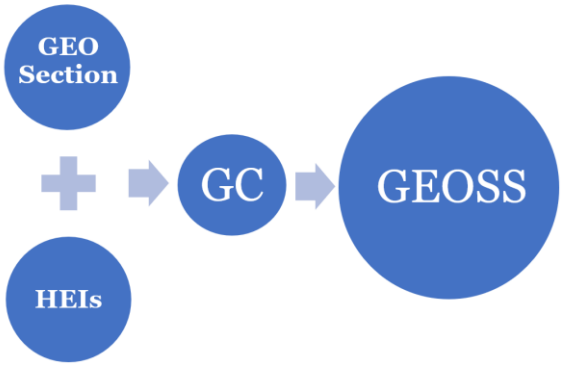
Kotter (2008) argued resistors are always present, and leaders should not ignore them because their capacity to delay or jeopardize a change attempt is formidable. An absence of participation and involvement may leave people feeling ignored and powerless. This may engage people into actions that slow, disrupt, and even sabotage a change plan (Deszca et al., 2020; Schein & Schein, 2017). However, people embrace change if they participate in the decision-making process. Consequently, I will mitigate the resistance to change by adopting the DL approach to create connections that allow people to be influential by accessing information and passing on valuable information.

Supports and Resources. Creating an adaptive network of stakeholders is vital for coping with unpredictable changes in the current world. This OIP requires the support of a network of stakeholders composed of the GC and the GEOSS.

***The Guiding Coalition*.** Figure 3 depicts the GC that will be derived from the GEO Section and the local HEIs including GEO student members. Initiatives can get entangled rapidly or paralyzed if too many people are involved in the decision-making process (Cohen, 2005). Consequently, the GC will have a few but critical leaders to enact the change process (Fisher, 2016). The intent of the coalition is to remove obstacles, clarify priorities, communicate with other stakeholders, resolve conflicts, and provide support.

Figure 3

Proposed GC Composition to Create the GEOSS



Note. GC = Guiding Coalition; GEO = Global Engineering Organization; GEOSS = GEO Student Society; HEIs = Higher Educational Institutions.

As a section chair, I am also responsible for the external communication of the GEO Section. I will work with the GEO educational counsellor (Fisher, 2016) to communicate the change plan to GEO student members and influential HEI administrators, especially deans. I will then invite adopters to collaborate with the GEO Section and form the GC. The coalition will consist of seven members: one faculty member, one HEI administrator (dean), two student leaders, the GEO Section treasurer, the GEO Section educational counsellor and I as the GEO Section chair.

The inclusion of different stakeholders' perspectives in the GC, as shown in Figure 3, ensures fairness by avoiding skewed decisions favouring personal interests. The GC is aligned with the interpretivism paradigm discussed in Chapter 1 that considers individuals' different perceptions, positive relationships, and individuals experiences (Mack, 2010; Pham, 2018).

With an effective coalition, change initiatives can have the support, energy, sense of urgency, and speed needed from the stakeholders to succeed (Cohen, 2005). According to Kotter (2014a), a GC must (a) ensure the network has a vision aligned with the goals and priorities of the change plan, (b) maintain open communication with members, (c) intervene when needed

but not control what is occurring in the network, (d) celebrate wins, and (e) keep members of the coalition connected with the formal system.

Kotter (2012) noted, “A strong guiding coalition is always needed—one with the right composition, level of trust, and shared objective” (p. 54). A GC is an essential part of the early part of the process of change. When constructing the GC, I will keep four key characteristics in mind when developing the GEOSS: position power, expertise, credibility, and leadership.

The GC is of paramount importance for the change process because it will work as an informal network of change agents representing students, faculty members, and the GEO executive section (Buckwalter & Sweeney, 2020). The main goal of the GC is to create a space where open dialogue is encouraged, a place to brainstorm, generate ideas, and engage in broadscale participation to foster collaboration between HEIs and the GEO Section.

The GC’s establishment will also be a critical milestone for the change process because it will create an environment where learning and organizational improvements can be advanced. In this environment, I will use the HL’s benefit of open communication to avoid unnecessary formal approvals, and keep deans and chairs informed about the initiative.

The GC will incorporate the student’s voice by adjusting the change initiative plan considering their ideas collected through student surveys and meetings with prospective student leaders. Therefore, students who are also change recipients will take part in all the change initiative steps, including planning implementation, diagnosis, and interpretation. The students’ participation is a fundamental aspect of the change efforts to guarantee that the change proposed is sustainable. Armenakis and Harris (2009) asserted effective change is not leader-centric but change-recipient-centric. They advocated a change recipient-centric minimizes the likelihood of making a mistake in implementing an intervention (Armenakis & Harris, 2009).

The GC’s informal system will provide the GEO Section and HEIs with flexibility and adaptivity to promote and create the GEOSS. The GC will plan and launch the petition to create

the GEOSS. Thus, GC members will champion the change; they will be the change initiators who clarify the vision for the change, provide support, and the required resources for the initiative.

GEO Student Society. The GEOSS will work as an agile network like a start-up and will have five GEO student members and volunteers for the positions of chair, vice-chair, treasure, secretary, and industrial officer (American Chemical Society, n.d.-e; Buckwalter & Sweeney, 2020; Emory & Raymond, 2016; Swartling, 2016; Watzky, 2018). The responsibility of each position is detailed in the internal GEO policy obligations (GEO Staff Member, personal communication, December 11, 2020). By operating like a start-up, the GEOSS will not inherit the hierarchical operating system of the HEIs or from the GEO Section. Therefore, silos that are typical in most well-developed organizations will not exist. Without silos, GEOSS can foster open communication in line with HL and trigger a high degree of collaboration between the HEIs and the GEO Section by establishing informal networks (Fultz & Smith, 2016; Grossman, 2012).

The GEOSS will work as a safe environment in which students can participate in existing events promoted by the GEO Section or create new events aligned with the HEIs and the GEO strategic plans. Moreover, the GEOSS will help students access funding, scholarships, and awards from GEO Canada Foundation and GEO headquarters, connect to local professionals, and develop leadership competencies (Blankenbuehler & Van Ness, 2018; Cooper et al., 2018; Grossman, 2012). Findings show that a psychologically safe environment contributes to collaborative behaviour, fosters creativity, and sets a participative and constructive climate (Austin & Harkins, 2008; Montes-González, 2016; Wright & Keirstead, 2018).

Time and Human Resources Limitations. Time is essential and can influence how the GEO Section approaches this OIP because the people who will be volunteering to work in the GC have jobs in the HEIs or other local organizations. The plan will incorporate several actions to mitigate the time issue. Change leaders will spend time wisely. The GC meetings will have a

flexible schedule, and a facilitator will ensure clear communication and fast decisions. Due to the COVID-19 pandemic, video-conferencing will replace face-to-face biweekly meetings.

Another essential limitation is the need for high engagement of faculty members and students. In the beginning, without the participation of faculty members, this change cannot move forward. In the end, without the massive support of students, the change initiative cannot last (Cooper et al., 2018; Emory & Raymond, 2016). The creation of the GC will mitigate this human resource limitation.

Financial Support. Any change initiative will cost money, but the change plan will not require financial aid from HEIs. The GEO Section can provide financial resources to start and maintain GEOSS in the first operation year. The second potential source of funding is the local chapters of engineering associations, especially OACETT and PEO. Finally, once the GEOSS is established, resources will be accessed by GEOSS directly from GEO foundation and GEO headquarters (American Chemical Society, n.d.-b, n.d.-f, n.d.-g).

Potential Implementation Issue. GEO Section's executives will select volunteers following the GEO legal obligations (GEO Staff Member, personal communication, December 11, 2020). Positions for volunteers to compose the GC will be announced via email to GEO members and workshops about the change initiative. Volunteers are likely to step forward once they realize this OIP presents an opportunity to create a truly better local community by providing students with opportunities for networking and learning from forward-thinking professional engineers from GEO Section. The potential implementation issue will be mitigated by creating an openness to new ideas, facilitating a continuous learning environment, and engaging stakeholders in small wins celebration to build momentum (Kotter, 2014b).

Building Momentum for Change. Short-term wins have the power to leverage momentum because they can turn neutral stakeholders into adopters and resistors into active supports (Kotter, 2012). The way to create momentum is to celebrate short-term wins. They

should be sufficiently fast to energize the change agents, enlighten the pessimists, and defeat the cynics (Thundiyil et al., 2015).

I will create positive energy by inviting stakeholders to social events to celebrate the achievements of each of the goals, especially the formation of the GC and the GEOSS. As a section chair, I will also request awards for those who have demonstrated leadership and helped build the GEOSS. Furthermore, I will write newsletters to highlight success stories of the GEOSS's progress (Golden & Lolinco, 2016).

Section Summary

In this section, I presented the change implementation plan that will support a student-run society to trigger a high degree of collaboration between the local HEIs and the GEO Section. I introduced the short-, medium-, and long-term goals and priorities of the plan. Then, I described a framework that includes the implementation plan divided into four phases and integrates with Schein's change model (Schein & Schein, 2017). The plan stresses that a GC is essential to gain and sustain engagement and buy-in from key stakeholders. Then, I reviewed stakeholders' reactions and the importance of open communication to mitigate resistance to change and create an environment that can sustain improvement through collaboration and teamwork. I also mentioned the support and resources available for the change initiative, including the GEO foundation's financial support. Finally, I highlighted short-term wins as a stimulus for the GC to foster the student-run society's development and maintenance.

Change Process Monitoring and Evaluation

As the GEO Section chair and member of the GC, I have the capacity and agency to share the responsibility for monitoring and evaluation. I will be involved in all stages of the change process to keep the actions aligned with the change implementation plan's goals and priorities. Therefore, I must ensure that the change initiative is well-assessed and determine strategies and tactics to keep track of the change process and gauge the OIP implementation progress.

Deszca et al. (2020) noted, “What gets measured affects the direction, content, and outcomes achieved by a change initiative” (p. 371). Well-planned monitoring and evaluation with useful measurements can foster accountability, clarify the need for change and expected results, and drive forward the change initiative to successful completion (Langley et al., 2009). However, it is challenging to define a framework with measurement tools for monitoring and evaluation (Markiewicz & Patrick, 2016; Patton et al., 2016). Butler et al. (2003) stated, “The evaluation of the organizational change is a thorny issue” (p. 55). The authors further argued that evaluation is an inference that uses assumptions and values to derive conclusions. The reason for a chaotic organizational response to changes is twofold. First, it is challenging to collect data depicting the reactions of the stakeholders. Second, the data can be distorted by an intricate reasoning process when values are taken for granted (Butler et al., 2003). To address these challenges, I will consider adopting a long-lasting monitoring and evaluation process using an iterative framework to address students’, faculty members’, and GEO Executive members’ perspectives (Donnelly & Kirk, 2015; Markiewicz & Patrick, 2016; Patton, 2015). With diverse worldviews or perspectives, interpretivist leaders can describe events and understand them considering the organizational context (Pham, 2018).

In this OIP, the mixed-method approach is used to provide a more holistic view of the PoP by combining quantitative methods with several approaches for interpreting stakeholders' perspectives qualitatively (Creswell, 2014; Mertens & Wilson, 2012). As such, the OIP considers the interpretation of multiple values and perspectives of stakeholders (i.e., students, faculty members, HEI administrators, and GEO Section executives) using qualitative methods, including semistructured interviews, meetings, observations (Schein, 2013; Schwandt, 2008), and a balanced scorecard approach with variables associated with social interaction among stakeholders (Kao et al., 2017; Kaplan & Norton, 1996). These methods, confluent with interpretivism, increase the participation of stakeholders in the change process and strengthens

their ownership of the monitoring and evaluation framework and bolster the validity and usability of evaluation (American Evaluation Association, n.d.).

Strategies and Tactics for Monitoring and Evaluating Change

Gauging the progress during all phases of this change initiative is essential to ensure continued commitment from the stakeholders to create and sustain the GC and the GEOSS. This OIP will support monitoring that utilizes the AL cycle of observe-interpret-intervene (Heifetz et al., 2009) and an evaluation process that will be launched at the first stage of the change initiative and gradually evolve into evaluating the impact of this OIP (Markiewicz & Patrick, 2016; Patton et al., 2016).

The monitoring and evaluation process efforts will consider a strategy that stresses the following actions:

- Before starting the change initiative, leaders will evaluate the change plan and define multiple indicators (Kaplan & Norton, 2006) to keep track of strategic objectives derived from the goals and priorities of the change implementation plan.
- The GC will be accountable for the monitoring and evaluation. The engagement and empowerment of the GC members can help in the sustainability of the GEOSS (Emory & Raymond, 2016).
- Diverse tactics will be used to improve the overall process for assessing the responses to change including patterns of behavior such as resistance to change initiatives (Kaplan & Norton, 2006; Markiewicz, 2005).
- The current state of events will be continually assessed by a built-in feedback mechanism (Markiewicz & Patrick, 2016; Patton, 2015; Patton et al., 2016) to account for incremental changes at the stages of Schein's change model (Schein & Schein, 2017), described in Chapter 2.
- At the end of the change initiative, the lessons learned from multiple sources of feedback will be used to update the measurement strategies and tactics (Markiewicz

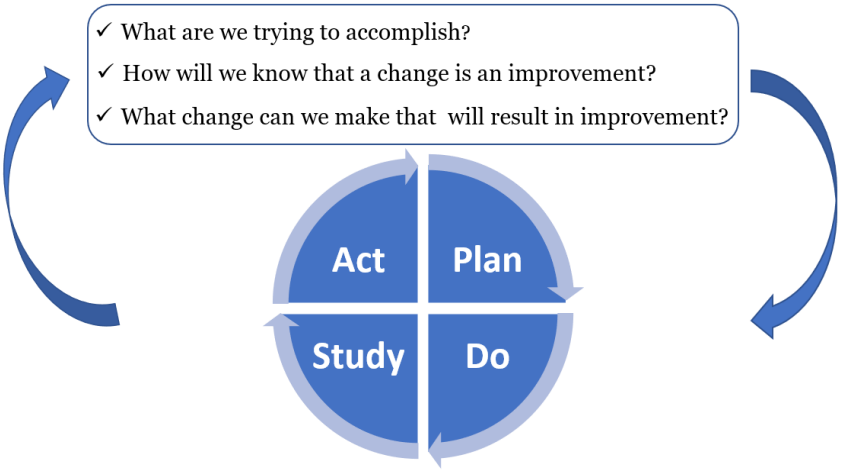
& Patrick, 2016). The updates will be integrated into the change model (Schein & Schein, 2017) to increase the probability of securing success.

Plan-Do-Study-Act Cycle

I will adopt the framework for monitoring and evaluation based on the plan-do-study-act (PDSA) cycle that is widely used in quality improvement (Christoff, 2018; Gopichandran et al., 2013; Moen & Norman, 2009; Murray, 2018; Taylor et al., 2014). The PDSA steps are commonly combined with three fundamental questions to form the model for improvement, as shown in Figure 4.

Figure 4

The PDSA Cycle



Note. Adapted from *The Improvement Guide: A Practical Approach to Enhancing Organizational Performance* (2nd ed., p. 454), by G. J. Langley et al., 2009, Jossey-Bass.

The iterative PDSA method (Christoff, 2018; Murray, 2018; Langley et al., 2009), depicted in Figure 4, will be used as a framework for monitoring as shown in the table of Appendix E. The table presents the summary of the monitoring and evaluation plan considering the PDSA cycle integrated into Schein's change model (Schein & Schein, 2017).

The monitoring process will support the iterative nature of the AL approach that involves observing events and patterns, interpreting what is observed to find out what is going on, and intervening to address identified adaptive challenges (Heifetz et al., 2009). I will also adopt

diverse tactics to account for the complex context of the monitoring and evaluation. Consequently, I will deepen my understanding about the interaction among the stakeholders, mainly student and faculty members, and ensure that the monitoring and evaluation process will provide the GC with information for decision-making process that will create and maintain the GEOSS. The tactics will include measurable factors unique in creating and maintaining the GEOSS. Appendix E also shows that the evaluation will use several tactics: observations, questionnaires, inquiries, surveys, debriefing meetings, and reflections (Dahlberg & McCaig, 2010; Patton, 2015). Moreover, the evaluation will be enhanced by the balanced scorecard model (Kaplan & Norton, 1992, 1996, 2006) and the humble inquiry approach (Schein, 2013) that resonates with HL (Schein & Schein, 2018) described in Chapter 2. In the following subsections, the process of monitoring and evaluation is described through the PDSA cycle (Moen & Norman, 2009) in combination with diverse tactics for evaluation.

Plan. The plan step will be integrated with the first stage of Schein's change model (Schein & Schein, 2017), which is aligned with Phase 1 of the implementation plan of this OIP. Schein's model dynamics will foster evaluations for determining driving forces for the motivation for change and restraining forces that create learning and survival anxieties. Schein (2013) argued that leaders cannot understand a system until they try to change it. Unless I intervene, I will not learn what some of the system's essential dynamics are. The intervention process itself will change the system and provide some of the most critical data about how the system works. The intervention evokes the iterative AL cycle of observe-interpret-intervene (Heifetz et al., 2009).

In the observation stage, I will gather multiple forms of evidence from various GEO senior members by observing their interaction with a group of students and faculty members during GEO activities (i.e., technical seminars, symposiums, and hackathons). By considering the multiple stakeholders' views and interests, I will work congruently with the interpretivist lens that will help me interpret the meanings that stakeholders, especially students, generate of

their realities (Creswell, 2014; Schwandt, 2000). The observation is an important source for learning and will lead to other evaluation methods such as surveys. The task of interpretation will involve assessing hypotheses derived from observations and brainstorming possible indicators to gauge short and medium-term objectives during the change initiative. Based on the evidence collected and interpretations, I will intervene to evaluate and confirm information received from faculty members, HEI administrators, and students about their interest in enacting events to ensure collaboration between the GEO Section and local HEIs. Before presenting and starting the implementation of the plan, I will conduct a month-long survey and interviews with key stakeholders and prospective change leaders, as indicated in Appendix E. The surveys will be online questionnaires combining objective and short-answer questions.

The surveys and interviews are used at this stage to uncover the different perspectives of stakeholders (Lambrechts et al., 2011; Schein, 2013). As such, I will assess the understanding of stakeholders, especially students and faculty members, about the gap between the GEO Section and HEIs. I will determine how they feel about the gap issue and what kind of behaviour they wish to establish to foster collaboration between the GEO and HEIs. The information will help me to elaborate a comprehensive draft plan encompassing the voices of students and faculty members.

Considering that a safe environment for open communication already exists in the GEO Section, I will interview GEO senior members using the inquiry as defined in the HL approach. The inquiry will be essential for building momentum to start the change initiative with the GEO Section executive team's participation. Using surveys and interviews based on humble inquiry (Schein, 2013), I will assess students' and faculty members' enthusiasm to participate in a joint effort to create the student society to mitigate the gap between the GEO Section and HEIs.

Humble Inquiry. Humble inquiry is one reliable way of gathering information or data throughout a conversation process based on the premise that an open and trusting relationship can free communication channels from bias and enable minimal distortions in the information

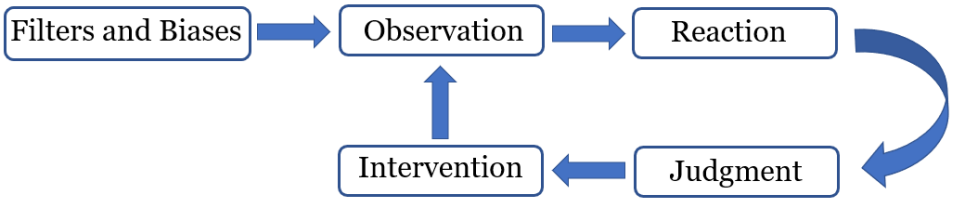
input (Schein, 2013). The humble inquiry model is depicted in Figure 5. There are no strict rules on how to do humble inquiry. In addition, the method is aligned with interpretive approach because I will focus on learning in complex nonlinear environment by enhancing stakeholders' voices using participatory semistructured interviews (Markiewicz & Patrick, 2016; Schwandt, 2008).

The humble inquiry will be essential for gaining a better understanding of the culture and reality of HEIs that is constructed in the interaction between students, faculty members, HEI administrators, and other people from the local community (Lambrechts et al., 2011; Schein, 2013; Schein & Schein, 2019). Furthermore, the humble inquiry will be instrumental for this OIP because its essence is around creating relationships. Consequently, the stakeholders will tell me what is really in their minds. As explained in Chapter 1, the organization has people of different cultural backgrounds. The same is true for HEIs. Each culture has different rules about the appropriate way to interact with each other. As such humble inquiry will be instrumental in helping build trusting relationships to trigger and maintain the change process defined in this OIP to create an environment in which people of different occupational and cultural backgrounds can collaborate and bridge the gap between the GEO Section and HEIs for the benefit of students. Later in the change process, the humble inquiry can help create a secure psychological environment (i.e., student society) in which students can make mistakes, learn from them, and enhance their rate of success in transitioning from HEIs to the workforce.

Although communication is a complex process, it is possible to analyze humble inquiry's importance for evaluation by using a simple and straightforward mental model known as the observation, reaction, intervention, and judgment (ORJI) cycle (Schein, 2013), as depicted in Figure 5. The humble inquiry method combined with my interpretivist lens will help me establish an open and trusting relationship that will trigger a collaborative communication between the GEO Section and HEIs.

Figure 5

The ORJI Cycle



Note: Adapted from Humble Inquiry: *The Gentle Art of Asking Instead of Telling* (p. 90), by E. H. Schein, 2013, Berrett-Koehler, Copyright, 2013 by E. H. Schein.

In summary, the adoption of the humble inquiry (Schein, 2013) rests on the assumption the evaluator must observe and listen carefully, and not interfere in the content or in the form the message is transmitted. Consequently, the evaluator can maximize information disclosure by using personal questions or open questions that reveal people's thoughts or feelings.

Do. As shown in Appendix E, both the do and study phases integrate with the learning new concepts stage of Schein's change model (Langley et al., 2009; Schein & Schein, 2017). This step involves two milestones: creating the GC and launching the petition to create the GEOSS. The creation of the GC and the GEOSS are small wins that will be celebrated across the GEO Section and HEIs. After reaching the first milestone, the GC will perform a detailed survey including the large community comprising faculty members, students, alumni from the local HEIs, professional engineers, and people recognized as representatives of the community and engaged with education and professional development.

Balanced Scorecard Model. The survey will cover the four perspectives defined in the balanced scorecard (BSC) model represented in Appendix F (Kaplan & Norton, 1996). The GC will use the BSC as an evaluation method. Initially, the BSC will define and refine the key performance indicators (KPIs) for the BSC. The KPIs will be used to determine what is working and what is not working within the change initiative. The primary function of the KPIs is to generate data through formative and summative assessments that will document the various

aspects of the change initiative and help the GC assess the progress of this OIP, detect gaps, and determine levels of resistance to change.

The BSC model is useful for nonprofit organizations (Anastacio, 2016; Kaplan & Norton, 2006). The BSC will translate this change initiative into a comprehensive group of KPIs determined and refined by the GC during the do stage. The BSC, as shown in Appendix F, measures the initiative success considering four perspectives: internal processes, financial, customer, learning and growth (Kaplan & Norton, 2006; see also Deszca et al., 2020). The BSC model will enable the GEO Section and other stakeholders to track the change initiative through an interactive process among stakeholders, which will enable them simultaneously monitor progress and measure the KPIs while defining the four perspectives of the BSC model that emanate from the goals and priorities of the OIP. Once the KPIs are defined, the GC will turn the BSC model into action and connect the action to learning. Each perspective represented in Appendix F can be characterized by a matrix of measurable factors or KPIs that can gauge how well the GEO Section would be achieving the goals of the implementation plan.

Study. In the third step, the GC will evaluate the change process to verify if the outcomes match the expectations or the goals of the OIP. The GC will implement interventions to minimize the likelihood of making mistakes in the establishment of the GEOSS. Armenakis and Harris (2009) stressed that without a systematic diagnosis a leader could never be sure whether the organization's change is appropriate. The diagnosis will show how well the initiative change is aligned with the planning phase's goals. Kotter (2012) noted change impediments are much more likely to come from problems related to the misalignment of structures and systems than from individuals engaged in resistance. Surveys will be prepared and communicated to all stakeholders, especially members of the GEOSS and the GC, volunteers, and other supporters. The evaluation is necessary to help the change agents collect and analyze data, monitor progress, and measure the impact of the GEOSS considering predetermined KPIs.

The do and study steps will be integrated with the second stage of Schein's change model (Schein & Schein, 2017) that manages the transition through which stakeholders learn new concepts, define the conditions desired after the change, and evaluate stakeholders' commitment toward the future state.

Act. In the final step of the PDSA cycle (Langley et al., 2009), the monitoring process will focus on internalizing new concepts by scheduling time out for reflections using feedback from surveys, humble inquiry, and the KPIs from the BSC model. Furthermore, a debriefing meeting will be vital for retrieving and evaluating lessons learned. The meeting will assess the strengths and weaknesses of the change initiative using a simple feedback procedure based on the following questions: (a) what were the expected results, (b) what were the actual results, (c) why did the actual results happen, and (d) what can be done better next time? As the change leaders explore these questions, they will reflect on whether the plan should be adopted, modified, or discarded.

The last steps of the PDSA cycle and Schein's change model will be integrated to foster the process of internalizing the change (Langley et al., 2009; Schein & Schein, 2017). The success of this OIP does not rest solely on the planning and process for monitoring and evaluation. It is also essential to consider how people interact and create conditions to progress, foster psychological safety, and construct an environment in which they can develop and share ideas without fear and sufficient details. The success of this OIP also depends on a quality communication plan implementation to engage the stakeholders and build trust in their relationship.

Section Summary

In this section, I described the monitoring and evaluation process that will be used to implement this OIP. First, I considered strategies underlining the responsibility of the GC to monitor and evaluate the change process. I highlighted the importance of adopting multiple tactics for assessing the responses to change, including patterns of human behaviour such as

resistance to change. Then, I presented how the chosen solution to form the GEOSS can be implemented throughout the PDSA cycle in combination with Schein's change model (Langley, 2009; Schein & Schein 2017). I took into consideration diverse tactics for evaluation, including the BSC model (Kaplan & Norton, 2006) that offers the possibility to gauge the change using different perspectives and the humble inquiry based on the premise that the adoption of HL can establish open and trusting communication. Finally, I stress that the monitoring and evaluation success depends on the success of a communication plan to engage the stakeholders and build trust in their relationship (Torppa & Smith, 2011).

Plan to Communicate the Need for Change and the Change Process

Communication amongst and across change leaders and stakeholders is necessary for the successful implementation and sustainability of this OIP. An effective communication plan is needed to inform necessary refinement to the implementation plan (Deszca et al., 2020). The communication plan is also essential to verify the impact of the strategies and tactics from the monitoring and evaluation in each phase of the change plan (Torppa & Smith, 2011).

Kotter and Cohen (2002) argued, "Good communication is not just data transfer. You need to show people something that addresses their anxieties, that accepts their anger, that is credible in a very gut-level sense, and that evokes faith in the vision" (p. 84). This OIP will require communication on a more personal level with leaders from HEIs, including deans, chairs of engineering programs, and students who are GEO members and prospective volunteers for leadership roles. This communication plan aims to inform the vision for this OIP, establish a sense of urgency, and foster honest disclosure of information. Moreover, the communication plan looks forward to building readiness, mobilizing the change leaders, and bolstering the relationship between the GEO Section and HEIs to provide students with specific information on how the GEOSS can positively affect their future.

The Communication Plan for Change

The communication plan adopted is based on the model presented by Deszca et al. (2020) as depicted in Figure 6. The model is to disseminate essential messages, foster the need for change, educate people about the impact of the change on them, and keep the stakeholders engaged in the change process.

Figure 6 also shows the main actions of each phase, which will create a collaborative climate between the GEO Section and the local HEIs. Thus, the communication plan will establish a foundation for developing the implementation plan and monitoring the progress of this OIP.

Figure 6

Four Phase of a Communication Plan for Change

Note. Adapted from *Organizational Change: An Action-Oriented Toolkit* (p. 350), by G. Deszca et al., 2020, SAGE. Copyright (2020) by SAGE.

Connecting Communication Plan with the Schein's Change Mode

Table 4 shows how the communication plan phases connect to Schein's change model (Schein & Schein, 2017), discussed in Chapter 2. The GC's change leaders will examine this

communication plan and adjust as needed before enacting the implementation plan discussed earlier.

Table 4

Schein's Change Model Connected with the Communication Plan

Schein's Change Model Phases	Communication Plan Phases	Descriptions
Creating the Motivation to Change	Prechange Approval	- Attract initiators of change: senior executives and key stakeholders
	Developing the Need for Change	- Explain the need for change - Clarify the steps of the change process - Create a sense the urgency and enthusiasm
Learning New Concepts and Changing	Midstream Change and Milestone Communication	- Celebration of the creation of the GC (small win) - Inform progress - Address misconceptions - Listen to feedback - Explain the structure of the GEOSS - Clarify roles Sustain enthusiasm - Celebration of the creation of the GEOSS (small win)
Internalizing the Change	Confirming and Celebrating the Change	- Inform stakeholders of the success - Celebrate the change - Gain momentum for the next change cycle

Note. Adapted from *Organizational Change: An Action-Oriented Toolkit* (p. 350), by G. Deszca, C. Ingols and T. F. Cawsey, 2020, SAGE. Copyright (2020) by SAGE.

Table 4 also shows the actions for each phase of the change communication plan that focus on educating and mobilizing stakeholders to form the GEOSS. The full-scale enactment of the communication plan will require dedicated stakeholders or ambassadors to be selected from the GC.

Prechange Approval. As section chair, I will be the initiator of the change. Before undertaking the change initiative, I will focus on communication to attract the internal stakeholders' attention, especially from the GEO Section executives. I will begin by communicating with potential adopters and seeking buy-in from critical leaders from the GEO Section.

I will reach prospective volunteers from HEIs to disseminate the advantages of developing the GEOSS gradually. As shown in Appendix G, I will use diverse communication methods, especially face-to-face meetings, virtual meetings, and peer-to-peer interactions, to raise HEI volunteers' and GEO Section executives' interest in joining the change initiative.

I will access essential information and connect with people of different backgrounds but with shared educational aspirations toward actions to bridge the gap between the GEO Section and HEIs. I will use diverse synchronous and asynchronous approaches existing in the organizational structure to communicate with GEO members, especially with senior members who are prospective leaders. I will explore the GEO virtual platform, a communication tool developed by GEO headquarters to allow members and guests to collaborate and network. With the tool, I can also reach former members. As a result, a critical number of volunteers will be reached to create momentum and ensure progress on the change initiative.

I will explore the process of persuasive communication by crafting messages considering the target audiences and using graphical representation to clarify key information. As a section chair, I have access to a tool called GEO Analytics, which generates graphs from membership data. I can also present data relating to informal interactions with HEI administrators and faculty members. I have messages from program chairs and faculty members showing that they are interested in enacting a joint initiative with the GEO Section to create events to foster creativity, critical thinking, communication, and cooperation.

It is also essential to have approval from HEI student leaders. They are important because they can be part of the GC that will communicate directly with faculty members and other students using an intranet, emails, and video-conferencing. With early adopters from HEIs, I will meet with HEI administrators and faculty members to introduce key messages about the change proposal of this OIP that outlines the creation of the GC and the GEOSS.

In summary, this first communication phase is to create awareness and gain the approval of key stakeholders. As a change initiator, I consider this phase as the moment to persuade key

stakeholders to accept the change initiative as an opportunity for acquiring intellectual stimulation, networking, and accessing a wealth source of practical ideas. In the next phase, the adopters will move from awareness to decision, and later they will move from decision to action.

Creating the Need for Change. In this second phase, I will use the AL and HL approaches to intervene, observe, and establish open conversations to yield a psychologically safe learning environment in which I can establish brainstorming sessions. In the initial communication, the brainstorming sessions will be with a large group of stakeholders supporting the initiative change. The brainstorming sessions will be vital because supporters from HEIs and GEO Section have different disciplinary backgrounds. They represent the diverse perspectives of the change agents and change recipients. I will invite HEI administrators, especially deans and program chairs of the engineering schools, to attend the brainstorming sessions. HEI leaders' participation is essential because a key principle in initiating change is that authority figures effectively communicate both the need and steps for that change (Deszca et al., 2020). As such, it is critical for deans and program chairs to share information about the change initiative with colleagues via email and at informal events to communicate the urgency and garner support.

As discussed previously, faculty members, students, and HEI administrators have contacted the GEO Section and requested events aligned to their action plan regarding. However, I cannot assume that they will accept the OIP implementation strategy, although the OIP stresses the importance of creating a team that will develop events for bridging the gap between the GEO Section and HEIs. Duck (2001) argued leaders cannot assume "they already … [have] the hearts and minds of individual contributors" (p. 229). As shown in Appendix G, I will hold a face-to-face meeting with key stakeholders, including deans and program chairs. I can use the tool to show that faculty and student memberships are growing steadily. Moreover, I will explain the gap between the current and future stages as discussed in Chapter 2 and stress the

need for developing the GC and a student-run society to address the call for bridging the gap between GEO and HEIs.

Midstream Change and Milestone. In this third phase, I will use the DL approach to foster the communication process through the creation communication team (CT) derived from the GC. The success of the change plan depends on people with large networks of colleagues across the GEO Section, HEIs, and the local community. Thus, the communication team will write messages in different forms to reach multiple types of stakeholders.

I will also clarify the GC's roles, elucidate the actions to develop the petition, and request funding to create the GEOSS. I will then promote new brainstorming sessions to understand stakeholders' perceptions and observe initial reactions to this OIP. Equally important, the brainstorming sessions will provide stakeholders with opportunities to ask questions and present concerns.

The system of communication of this OIP encompasses HEIs, the GEO Section, and other stakeholders from the external community, including professional engineering associations. Therefore, the GC needs to communicate through many formal and informal channels. If this complex network of communication is interrupted, the message can be lost, and the process of change can fail. To avoid this issue, I will not work in isolation regarding the communication plan; instead, I will create a communications team.

Communications Team. Communication is the responsibility of all stakeholders, not just a few selected ones. However, a cross-functional communications team (CT) is needed to bring credibility to the change communication efforts by avoiding duplication of efforts, assessing current communications, measuring results, and establishing ongoing feedback (Barret, 2002). The GC will appoint three of their members to form the CT. Preference will be given to the volunteers who are leaders in their formal organizations, skilled facilitators, and social media savvy. The GC members should also be present on the GEO virtual platform and social networking sites used by students, faculty members, partners, and other prospective

stakeholders from the community. Moreover, the CT must comply with the ethical codes and communication requirements of the GEO Section and HEIs that emphasize integrity, fairness, equality, and care for others.

The CT does not represent a one-size-fits-all solution for communication. However, it will be a team of change leaders with the skills and networking capacity to improve the GC's internal and external communication during the change plan's implementation and later will be essential for sustaining the changes. Given the importance of communication for the success of this change initiative, the GC will invite executives from the GEO Section team to provide CT with additional support as it is needed. Moreover, the CT will share volunteer opportunities through the GEO website, social media, and emails.

Internally, the CT will be instrumental in appointing moderators for a meeting, ensuring that efforts are not duplicated, and avoiding communication containing distracting and irrelevant messages. The CT will also record meetings, prepare document review, as well as store and retrieve data from interviews, observations, surveys, inquiries, and email questionnaires used in the monitoring and evaluation processes. Moreover, the CT will coordinate efforts to prepare print media materials and develop audio and visual material for different social media platforms. Externally, the GC will be instrumental in selecting proper tactics to promptly collect information from stakeholders and promptly spread key messages, considering given circumstances and audiences. The CT will distribute press releases on significant achievements such as the consolidation of the petition to form the GEOSS. The petition is a request that will be addressed to GEO headquarters to obtain approval to create the GEOSS. The CT will also provide the webmasters of the GEO Section and partners with new information about the progress of the change initiative and cultivate personal relationships with the local community press media.

It is important to monitor results to ensure that the target audiences are receiving the message. The CT will evaluate the methods to communicate to determine what works, what does

not, and why. As a result, the CT will also work with the team members responsible for monitoring and evaluation. They will tailor short survey and communication KPIs for the BSC model used in monitoring and evaluation, as previously discussed. The surveys will have open questions to determine stakeholders' levels of understanding about the changes, including creating the GEOSS and its impact on the students. The assessment will happen every time a communication method is used to ensure continuous communication and accountability.

Finally, an essential part of building a team is celebrating success. When excellent news comes or a milestone is achieved, such as the foundation of GEOSS, messages underlying the success story will be sent through email and newsletters to celebrate and build on that success.

Confirming and Celebrating the Change Success. In the final phase of the communication initiative, the stakeholders involved in the change process need to communicate, assess future improvements, and keep celebrating the success in sustaining the GEOSS as done throughout the change process for short-term wins, including the formations of the GC and the GEOSS. Dudar et al. (2017) argued, "Change is a process not an event and as such change requires time" (p. 51). The communication plan will reiterate that the change initiative is not over and the process should continue to evolve until students and faculty members can detect the impact of their efforts regarding the success of collaboration between the GEO Section and local HEIs through the development of the GEOSS.

After creating the GEOSS, I will invite the GC to organize a social gathering for an informal celebration at the school. The celebration will allow the stakeholders to interact with each other, establish conversations, and trigger brainstorming that will create the momentum to start the next cycle.

Appendix G indicates that various communication channels will be used to spread the success of this OIP. As a GEO Section Chair, I will submit newsletters for publication and request the CT use all resources to disseminate the successes. Deszca et al. (2020) argued, "It

takes 15 to 20 repetitions before a message gets communicated effectively" (p. 353). As a result, the variety of communication channels shown in the table are essential for this OIP.

Section Summary

In this section, I indicated the importance of communication to enact a successful change initiative. First, I introduced the communication plan based on the model presented by Deszca et al. (2020) and how it relates to Schein's change model (Schein & Schein, 2017). Then, for each phase of the change plan, I stressed the use of diverse communication methods, including the most efficient for the organization, the face-to-face meetings, and peer-to-peer interactions. I also noted the importance of forming the GC's communication team to enhance the communication by creating clear messages considering different communication channels and stakeholders. Finally, I highlighted the importance of the communication plan to spread this OIP and celebrate the success of this initiative change.

Next Steps and Future Considerations

Two next steps are recommended after implementing this OIP. The first step is to ensure that change leaders remain committed to the vision and conforming with the AL's key actions: observe, intervene, and interpret (Heifetz et al., 2009). Implementing change and determining outcomes are not easy endeavours. Having a student society does not mean that the change initiative is over. The completion of the OIP with the creation of the GEOSS sets the stage for a continuous change process to establish and maintain the collaboration between the GEO Section and local HEIs. As this next step, I will monitor and revise the practices implemented to ensure that the GEOSS remain engaged with the local community. I will monitor the GEOSS, not to control the student initiative but rather to support their efforts and achievements to bridge the gap between the local HEIs and GEO.

The next step is to keep the GC activated and committed to maintaining the momentum needed to ensure a critical mass of participants in leadership roles. The long-term success of this OIP will depend on the consolidation and maintenance of the climate of collaboration, and the

conversations among leaders from the local HEIs, the GEO Section, sponsors, and key stakeholders, especially Profession Engineers Ontario and the Ontario Association of Certified Engineering Technicians and Technologists. The GC can create bonds between the GEO Section and the HEIs that will strengthen the succession plan of the GEOSS and increase the sustainability of the change initiative. When a key person like a society chair leaves and the position is not filled immediately, the society can incur discontinuation that could leave the organization unprepared for the challenges lying ahead. The GC can mitigate this problem by helping the GEOSS to identify future leaders and promote leadership development by connecting students with the GEO leadership program.

Moreover, the GC can guide volunteers from the GEO Section to connect with the GEOSS and collaborate with faculty members. Volunteers from the GEO Section can work with GEO student members and faculty members to promote applied inquiry-based learning and develop lesson plans connecting students to real-world problems. They can also organize workshops to encourage and empower them to provide STEM education integrated with leadership competencies and skills to face 21st-century challenges.

The first future recommendation is to create opportunities for GEOSS to collaborate with HEIs to answer the calls for engagement with the local community. The GEOSS can provide HEIs with a vast repository of information, a wealth of experience from volunteers, and the leadership to connect students and faculty members with the local community in unimaginable ways before this OIP.

As a section chair, I will strive to connect the GEOSS with local businesses interested in enacting applied research projects that can provide GEO student members with a real-world experience to use the skills they have learned in the engineering program. The community engagement is perfectly aligned with the vision of the OIP because it will allow students to develop critical thinking, creativity, leadership, local community dynamics, understanding of ethical issues, and citizenship.

This OIP is also grounded on GEO's core values to promote inclusion and equity. As mentioned in Chapter 1, the GEO Section is a male-dominated organization. My OIP does not directly address the issue, but another future consideration is to create a GEO branch for women with the support of the GEOSS to encourage women students to network at a local level and develop leadership skills. As mentioned in Chapter 1, the GEO Section is a male-dominated organization. My OIP does not directly address the gender issue, but another future consideration is to create a GEO branch for women (Northeastern University College of Engineering, n.d.) with the support of the GEOSS to encourage women students to network at a local level and develop leadership skills. In addition, my OIP does not directly address international students, but another future consideration is to use the GEO mentorship program and networking events to provide international students with an opportunity to mitigate their psychological distress triggered by stressors, such as language barriers, discrimination, isolation, homesickness, financial hardship, and loss of their social network (Thomson & Esses, 2016). I must consider, however, that the events may also increase international students' anxiety because they would be in a social setting that may challenge their language skills.

Finally, the world is becoming more technologically complex, highly interdependent, and culturally diverse. To cope with disruptions and unpredictable events, such as the COVID 19 pandemic, I must consider that change leadership is a perpetual process. As a change leader, I wish to continually refine strategies and tactics for planning, communicating, monitoring, and evaluating.

Chapter Summary

Change is a process that involves careful planning, monitoring, evaluation, and communication to be successful. In this chapter, I outlined the implementation plan embedded with Schein's change model (Schein & Schein, 2017) to operationalize the chosen solution based on forming a student-run society. The change plan highlights an approach to engaging a coalition of change-leaders from HEIs and the GEO Section to develop the GEOSS to enable

collaboration between the local HEIs and the GEO Section. The change plan also considers open communication and peer-to-peer interactions as effective ways to mitigate resistance to change (Schein, 2013). I explored diverse monitoring and evaluation strategies and tactics entangled with cycles of the PDSA model (Christoff, 2018; Langley et al., 2009), while working congruently with the interpretivism (Creswell, 2014; Ryan, 2018). Finally, various communication methods were explored, including creating a CT essential for supporting the change process required for enacting this OIP.

OIP Conclusion

In conclusion, this OIP presents a plan for ensuring that the GEO Section can collaborate with local HEIs. This change initiative seeks to mitigate the gap between HEIs and GEO by creating a student-run chapter to promote events needed to impact the future of students positively.

This OIP is an adaptive challenge addressed by a GC composed of leaders from HEIs and the GEO Section who share the sense of urgency for helping students in the school-to-work transition. This OIP integrates the DL and AL approaches into Schein's change model (Schein & Schein, 2017) that connects with the cyclical PDSA method (Christoff, 2018; Langley et al., 2009). The PDSA serves as an effective framework for strategies and tactics for ongoing monitoring and evaluation of events to create and sustain the GEOSS. Drawing from HL, this OIP anticipates offering valuable insights from stakeholders through the inquiry process inherent to the HL. The implementation does not rest solely on planning and evaluation. A good communication plan is also essential and affects my whole OIP. This OIP relies on a savvy communication team to engage stakeholders in a collaborative relationship or ongoing coalitions to motivate the target audiences, build understanding, nurture change, and successfully accomplish outreach work to advance the GEO Section's mission regarding this OIP.

The GEO Section and HEIs have an excellent opportunity to promote organizational change by engaging volunteers from the community with a wealth of education and engineering experience. The hope is that this OIP will contribute to student engagement with the local community, improve their engineering skills, broaden their education, and give them a real-world venue in which they become well-rounded citizens. To ensure that students can develop the needed professional competencies including nontechnical skills, the GEO Section and the GC must consider that a change process requires time and needs reinforcement to close the student skills gap.

Finally, this OIP has been a unique scholarly experience that has provided me with knowledge and experience that has inspired me to realize and appreciate the complexity and the importance of change and ethical leadership. As I move forward with the plan to create a student chapter, I feel confident and excited to bring to the real world this OIP and navigate into future experiences where I will be working into projects that will combine technical knowledge with the essential skills for bridging the gap between engineering schools and workplaces within the local community.

References

Adams, M. R. (2016). The Xavier University of Louisiana student ACS chapter: An organization guided by a university mission. In M. J. Mio & M. A. Benvenuto (Eds.), *Building and maintaining award-winning ACS student member chapters* (Vol. 1, pp. 123-136). American Chemical Society. https://doi.org/10.1021/bk-2016-1229.ch009

American Chemical Society. (n.d.-a). *ACS student chapters*. https://www.acs.org/content/acs/en/education/students/college/studentaffiliates.html

American Chemical Society. (n.d.-b). *ACS student grants*. https://www.acs.org/content/acs/en/funding-and-awards/grants.html

American Chemical Society. (n.d.-c). *Chapter activities*. https://www.acs.org/content/acs/en/education/students/college/studentaffiliates/activities.html

American Chemical Society. (n.d.-d). *Finding a mentor*. https://www.acs.org/content/acs/en/education/students/college/findingamentor.html

American Chemical Society. (n.d.-e). *Roles & responsibilities*. https://www.acs.org/content/acs/en/officer-toolkit/roles-and-responsibilities.html

American Chemical Society. (n.d.-f). *Scholarship*. https://www.acs.org/content/acs/en/funding-and-awards/scholarships.html

American Chemical Society. (n.d.-g). *Student chapter award*. https://www.acs.org/content/acs/en/funding-and-awards/awards/community/sachapter.html

American Evaluation Association. (n.d.). *Values of the American Evaluation Association (AEA)*. https://www.eval.org/About/About-AEA

Anastacio, S. (2016). Balanced scorecard model for Paulinian educational institutions. *International Journal of Curriculum and Instruction, 8*(1), 69–89.

Andrews, G., Aplevich, J. D., Fraser, R. A., & Macgregor, C. G. (2019). *Introduction to professional engineering in Canada* (5th ed.). Pearson Prentice Hall.

Appelbaum, S. H., Habashy, S., Malo, J.-L., & Shafiq, H. (2012). Back to the future: Revisiting Kotter's 1996 change model. *The Journal of Management Development*, *31*(8), 764–782. https://doi.org/10.1108/02621711211253231

Armenakis, A. A., & Harris, S. G. (2009). Reflections: Our journey in organizational change research and practice. *Journal of Change Management*, *9*(2), 127–142. https://doi.org/10.1080/14697010902879079

Arthur-Mensah, N., & Zimmerman, J. (2017). Changing through turbulent times–why adaptive leadership matters. *The Journal of Student Leadership, 1*(2), 1–13.

Association for Computing Machinery. (n.d.). *Student chapters*. https://www.acm.org/chapters/students

Austin, M. S., & Harkins, D. A. (2008). Assessing change: Can organizational learning "work" for schools. *The Learning Organization*, *15*(2), 105–125. https://doi.org/10.1108/09696470810852302

Baldauff, E. A. (2016). Establishing an award-winning student chapter to enhance the undergraduate experience. In M. J. Mio & M. A. Benvenuto (Eds.), *Building and maintaining award-winning ACS student member chapters* (Vol. 1, pp. 81–89). American Chemical Society. https://doi.org/10.1021/bk-2016-1229.ch006

Bandura, A. (2018). Toward a psychology of human agency: Pathways and reflections. *Perspectives on Psychological Science*, *13*(2), 130–136. https://doi.org/10.1177/1745691617699280

Barrett, D. J. (2002). Change communication: Using strategic employee communication to facilitate major change. *Corporate Communications: An International Journal*, *7*(4), 219–231. https://doi.org/10.1108/13563280210449804

Bernhardt, V. (2018). The continuous school improvement framework. *In Data analysis* (4th ed., pp. 11–26). Routledge. https://doi.org/10.4324/9781315101026-2

Blankenbuehler, M. T., & Van Ness, B. (2018). Staying the course. In M. J. Mio & M. A. Benvenuto (Eds.), *Building and maintaining award-winning ACS student member chapters* (Vol. 3, pp. 17–25). American Chemical Society. https://doi.org/10.1021/bk-2018-1278.ch002

Branson, C. M. (2014). The power of personal values. In C. M. Branson & S. J. Gross (Eds.), *Handbook of ethical educational leadership* (3rd ed., pp. 195–209). Routledge. https://doi.org/10.4324/9780203747582

Brouet, S. (2016). Strategies for increasing membership and volunteerism within ACS student member chapters. In M. J. Mio & M. A. Benvenuto (Eds.), *Building and maintaining award-winning ACS student member chapters* (Vol. 2, pp. 43–51). American Chemical Society. https://doi.org/10.1021/bk-2016-1230.ch005

Buckwalter, N., & Sweeney, K. (2020). ICMA student chapters: Partnering with the next generation. *Public Management, 102*(8), 7–9.

Burke, W. W. (2018). *Organization change: Theory & practice* (5th ed.). Sage.

Burnes, B. (2009). Reflections: Ethics and organizational change – time for a return to Lewinian values. *Journal of Change Management*, *9*(4), 359–381. https://doi.org/10.1080/14697010903360558

Burns, J. (2011). *Leadership*. Harper Perennial.

Butler, J., Scott, F., & Edwards, J. (2003). Evaluating organizational change: The role of ontology and epistemology. *Tamara Journal of Critical Postmordern Organization Science*, *2*(2), 55–66.

Canadian Engineering Memorial Foundation. (n.d.). Canadian Engineering Memorial Foundation. https://www.cemf.ca

Carsten, M. K., & Uhl-Bien, M. (2013). Ethical followership: An examination of followership beliefs and crimes of obedience. *Journal of Leadership & Organizational Studies*, *20*(1), 49–61. https://doi: 10.1177/1548051812465890

Catano, V. M., Pond, M., & Kelloway, E. K. (2001). Exploring commitment and leadership in volunteer organizations. *Leadership & Organization Development Journal*, *26*(6), 256–263. https://doi.org/10.1108/01437730110403187

Christoff, P. (2018). Running PDSA cycles. *Current Problems in Pediatric and Adolescent Health Care, 48*(8), 198–201. https://doi.org/10.1016/j.cppeds.2018.08.006

Ciulla, J. (2014). *Ethics, the heart of leadership* (3rd ed.). Praeger.

Cohen, D. (2005). *The heart of change field guide: Tools and tactics for leading change in your organization*. Harvard Business School Press.

Cooper, E., Shaik, S., Bautista, D., Ahmed, A., Gaetano, C., Hockman, M., & Evanseck, J. D. (2018). Evolution of an awESOME chapter. In M. J. Milo & M. A. Benvenuto (Eds.), *Building and maintaining award-winning ACS student member chapters* (Vol. 3, pp. 55–71). American Chemical Society. https://doi.org/10.1021/bk-2018-1278.ch005

Creswell, J. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). SAGE.

Cranston, N., Ehrich, L. C., & Kimber, M. (2014). Managing ethical dilemmas. In C. M. Branson & S. J. Gross (Eds.), *Handbook of ethical educational leadership* (3rd ed., pp. 229–245). Routledge. https://doi.org/10.4324/9780203747582

Crotty, M. (2014). *The foundations of social research: Meaning and perspective in the research process*. SAGE.

Curfman, V. J., Dougherty, Q. E., & Levy, I. J. (2018). A conversation with the presidents: Nurturing a successful ACS student chapter. In M. J. Milo & M. A. Benvenuto (Eds.), *Building and maintaining award-winning ACS student member chapters* (Vol. 3, pp. 39–54). American Chemical Society. https://doi.org/10.1021/bk-2018-1278.ch004

Dahlberg, L., & McCaig, C. (2010). *Practical research and evaluation: A start-to-finish guide for practitioners*. SAGE.

Denzin, N. (1989). *Interpretive interactionism*. Sage.

DeRue, D. (2011). Adaptive leadership theory: Leading and following as a complex adaptive process. *Research in Organizational Behavior*, *31*, 125–150. https://doi.org/10.1016/j.riob.2011.09.007

Deszca, G., Ingols, C., & Cawsey, T. (2020). *Organizational change: An action-oriented toolkit* (4th ed.). Sage.

Dolan, C. W. (2013). *The engineering design challenge: A unique opportunity*. Morgan & Claypool. https://doi.org/10.2200/S00487ED1V01Y201303ENG021

Donnelly, P., & Kirk, P. (2015). Use the PDSA model for effective change management. *Education for Primary Care*, *26*(4), 279–281. https://doi.org/10.1080/14739879.2015.11494356

Duck, J. (2001). *The change monster*. Crown Business.

Dudar, L., Scott, S., & Scott, D. (2017). *Accelerating change in schools: Leading rapid, successful, and complex change initiatives* (Vol. 27). Emerald Publishing Limited. https://doi.org/10.1108/S1479-366020160000027006

Edwards, H. C. (2011). Orientation: Welcoming new volunteers into the organization. In T. D. Connors (Ed.), *The volunteer management handbook* (pp. 227–235). John Wiley & Sons. https://doi.org/10.1002/9781118386194.ch9

Emory, S. R., & Raymond, E. A. (2016). Key components of a successful and sustainable student chapter at a public-regional university. In M. J. Milo & M. A. Benvenuto (Eds.), *Building and maintaining award-winning ACS student member chapters* (pp. 15–30). American Chemical Society. https://doi.org/10.1021/bk-2016-1229.ch002

Engineers Canada. (n.d.). *National engineering month*. https://engineerscanada.ca/news-and-events/national-engineering-month

Feder, T. (2021). Hackathons catch on for creativity, education, and networking. *Physics Today*, *74*(5), 23–25. https://doi.org/10.1063/PT.3.4746

Feldmann, T. (2014). Understanding the dynamics of change and the impact on psychiatric education. *Academic Psychiatry*, *38*(6), 672–679. https://doi.org/10.1007/s40596-014-0211-y

Fisher, G. (2016). Role of chapter faculty advisors: Advice for advisors. In M. J. Milo & M. A. Benvenuto (Eds.), *Building and maintaining award-winning ACS student member chapters* (Vol. 2, pp. 1–6). American Chemical Society. https://doi.org/10.1021/bk-2016-1230.ch001

Fleming, S. A. (2016). Challenges faced by ACS student chapters. In M. J. Milo & M. A. Benvenuto (Eds.), *Building and maintaining award-winning ACS student member chapters* (Vol. 2, pp. 7–14). American Chemical Society. https://doi.org/10.1021/bk-2016-1230.ch002

Fullan, M. (2020). *Leading in a culture of change* (2nd ed.). Jossey-Bass.

Fullan, M., Quinn, J., & McEachen, J. (2018). *Deep learning: Engage the world, change the world*. Sage.

Fultz, M., & Smith, A. (2016). Symbiotic relations between ACS local sections and student member chapters – a case study. In M. J. Milo & M. A. Benvenuto (Eds.), *Building and maintaining award-winning ACS student member chapters* (Vol. 2, pp. 15–24). American Chemical Society. https://doi.org/10.1021/bk-2016-1230.ch003

Gallos, J. V. (Ed.). (2006). *Organization development*. Jossey-Bass.

Gamwell, P., & Daly, J. (2019). *The wonder wall: Leading creative schools in an age of complexity*. Sage.

Gini, A., & Green, R. M. (2014). Moral leadership and business ethics. In J. B. Ciulla (Ed.), *Ethics: The heart of leadership* (3rd ed., pp. 32–51). Praeger.

Golden, M. L., & Lolinco, A. (2016). Lessons on how to brand a mole and an award-winning ACS student chapter. In M. J. Milo & M. A. Benvenuto (Eds.) *Building and maintaining award-winning ACS student member chapters* (Vol. 2, pp. 25–41). American Chemical Society. https://doi.org/10.1021/bk-2016-1230.ch004

Goldstein, J. (2004). Making sense of distributed leadership: The case of peer assistance and review. *Educational Evaluation and Policy Analysis*, *26*(2), 173–197. https://doi.org/10.3102/01623737026002173

Gopichandran, V., Kumar, A., & Krishna, I. (2013). Monitoring "monitoring" and evaluating "evaluation": An ethical framework for monitoring and evaluation in public health. *Journal of Medical Ethics*, *39*(1), 31–35. https://doi.org/10.1136/medethics-2012-100680

Government of Ontario. (2020, October). *Ontario onwards: Action plan*. https://www.ontario.ca/page/ontario-onwards-action-plan

Greenleaf, R. K. (1977). *Servant leadership: A journey into the nature of legitimate power and greatness*. Paulist Press.

Gronn, P. (2002). Distributed leadership as a unit of analysis. *The Leadership Quarterly*, *13*(4), 423–451. https://doi.org/10.1016/S1048-9843(02)00120-0

Grossman, L. (2012). The benefits of joining professional organizations. In C. E. Stout (Ed.), *Getting better at private practice* (pp. 150–163). John Wiley & Sons. https://doi.org/10.1002/9781118089972.ch9

Habash, R. W. Y. (2017). *Green engineering: Innovation, entrepreneurship and design*. CRC Press. https://doi.org/10.4324/9781315116389

Habash, R. W. Y. (2019). *Professional practice in engineering and computing: Preparing for future careers*. CRC Press. https://doi.org/10.1201/9780429202735

Haiyan, Q., & Walker, A. (2014). Leading with empathy. In C. M. Branson & S. J. Gross (Eds.), *Handbook of ethical educational leadership* (3rd ed., pp. 112–127). Routledge. https://doi.org/10.4324/9780203747582

Harris, A. (2013). Distributed leadership: Friend or foe? *Educational Management, Administration & Leadership*, *41*(5), 545–554. https://doi.org/10.1177/1741143213497635

Harris, A., & Jones, M. (2020). COVID 19 - school leadership in disruptive times. *School Leadership & Management*, *40*(4), 243–247. https://doi.org/10.1080/13632434.2020.1811479

Harris, A., & Spillane, J. (2008). Distributed leadership through the looking glass. *Management in Education*, *22*(1), 31–34. https://doi.org/10.1177/0892020607085623

Hatch, M. J., & Yanow, D. (2003). Organization theory as an interpretive science. In C. Knudsen & H. Tsoukas (Eds.), *The Oxford handbook of organization theory: Meta-theoretical perspectives* (pp. 63–87). Oxford University Press.

Heifetz, R. A. (1994). *Leadership without easy answers*. Harvard University Press.

Heifetz, R. A., Grashow, A., & Linsky, M. (2009). *The practice of adaptive leadership: Tools and tactics for changing your organization and the world*. Harvard Business Press.

Heifetz, R. A., & Linsky, M. (2002). *Leadership on the line: Staying alive through the dangers of leading*. Harvard Business School Press.

Higgs, M., & Rowland, D. (2005). All changes great and small: Exploring approaches to change and its leadership. *Journal of Change Management*, *5*(2), 121–151. https://doi.org/10.1080/14697010500082902

Hinkle, C., & Koretsky, M. (2019). Toward professional practice: Student learning opportunities through participation in engineering clubs. *European Journal of Engineering Education*, *44*(6), 906–922. https://doi.org/10.1080/03043797.2018.1477119

Hobbs, S. (2011). The latest approach to volunteer recruitment: Competency-competence pathways and volunteer resource management systems. In *The volunteer management handbook* (pp. 203–225). John Wiley & Sons, Inc. https://doi.org/10.1002/9781118386194.ch8

Huang, L., & Paterson, T. A. (2017). Group ethical voice: Influence of ethical leadership and impact on ethical performance. *Journal of Management*, *43*(4), 1157–1184. https://doi.org/10.1177/0149206314546195

Irland, L. C. (2019). Ethics codes of professional societies: A quick look. *Journal of Forestry*, *117*(4), 412–416. https://doi.org/10.1093/jofore/fvz034

Jäger, U., Kreutzer, K., & Beyes, T. (2009). Balancing acts: NPO-leadership and volunteering, *Financial Accountability and Management*, *25*(1), 79–97. https://doi.org/10.1111/j.1468-0408.2008.00466.x

Johansen, R. (2017). *The new leadership literacies: Thriving in a future of extreme disruption and distributed everything*. Berrett-Koehler.

Kang, S. P., Chen, Y., Svihla, V., Gallup, A., Ferris, K., & Datye, A. K. (2020). Guiding change in higher education: An emergent, iterative application of Kotter's change model. *Studies in Higher Education*, 1–20. https://doi.org/10.1080/03075079.2020.1741540

Kao, S.-C., Wu, C., & Huang, C.-L. (2017). KCEBSA: Development of online knowledge community evaluation model using the balanced scorecard approach. *Journal of Enterprise Information Management*, *30*(4), 625–643. https://doi.org/10.1108/JEIM-12-2015-0123

Kaplan, R., & Norton, D. (1992). The balanced scorecard: Measures that drive performance. *Harvard Business Review*, *70*(1), 71–79.

Kaplan, R., & Norton, D. (1996). *The balanced scorecard: Translating strategy into action*. Harvard Business School Press.

Kaplan, R., & Norton, D. (2006). *Alignment: Using the balanced scorecard to create corporate synergies*. Harvard Business School Press

Kladifko, R. E. (2013). Practical school community partnerships leading to successful educational leaders. *Educational Leadership and Administration*, *24*, 54–61.

Koenig, D. R. (2018). *Governance reimagined: Organizational design, risk, and value creation* (2nd ed.). Right Governance.

Kotter, J. P. (2008). *A sense of urgency*. Harvard Business Review Press.

Kotter, J. P. (2009). Leading change: Why transformation efforts fail. *IEEE Engineering Management Review*, *37*(3), 42–48. https://doi.org/10.1109/EMR.2009.5235501

Kotter, J. P. (2012). *Leading change*. Harvard Business Review Press.

Kotter, J. P. (2014a). *Accelerate: Building strategic agility for a faster-moving world*. Harvard Business Review Press.

Kotter, J. P. (2014b). Seizing opportunities and dodging threats with a dual operating system. *Strategy & Leadership*, *42*(6), 10–12.

Kotter, J. P., & Cohen, D. S. (2002). *Heart of change: Real-life stories of how people change their organizations*. Harvard Business Review Press.

Kotter, J. P., & Rathgeber, H. (2016). *That's not how we do it here! a story about how organizations rise and fall-and can rise again*. Portfolio.

Kristinsson, S. (2014). The essence of professionalism. In C. M. Branson & S. J. Gross (Eds.), *Handbook of ethical educational leadership* (3rd ed., pp. 11–23). Routledge. https://doi.org/10.4324/9780203747582

Kuenzi, K., Stewart, A. J., & Walk, M. (2021). COVID-19 as a nonprofit workplace crisis: Seeking insights from the nonprofit workers' perspective. *Nonprofit Management & Leadership*, *31*(4), 821–832. https://doi.org/10.1002/nml.21465

Kuusilehto, L. (2014). A concern for caring. In C. M. Branson & S. J. Gross (Eds.), *Handbook of ethical educational leadership* (3rd ed., pp. 128–138). Routledge. https://doi.org/10.4324/9780203747582

Lambrechts, F. J., Bouwen, R., Grieten, S., Huybrechts, J. P., & Schein, E. H. (2011). Learning to help through humble inquiry and implications for management research, practice, and education: An interview with Edgar H. Schein. *Academy of Management Learning & Education*, *10*(1), 131–147. https://doi.org/10.5465/amle.10.1.zqr131

Langley, G. J., Moen, R. D., Nolan, K. M., Nolan, T. W., Norman, C. L., & Provost, L. P. (2009) *The improvement guide: A practical approach to enhancing organizational performance* (2nd ed.), Jossey-Bass.

Ledesma, E. B., & Mellis, B. (2016). A successful student chapter in the energy and medical capital of the world. In M. J. Milo & M. A. Benvenuto (Eds.), *Building and maintaining award-winning ACS student member chapters* (Vol. 1, pp. 31–47). American Chemical Society. https://doi.org/10.1021/bk-2016-1229.ch003

Lewis, L. (2019). *Organizational change: Creating change through strategic communication* (2nd ed.). John Wiley & Sons.

Liu, H. (2017). Reimagining ethical leadership as a relational, contextual and political practice. *Leadership*, *13*(3), 343–367. https://doi.org/10.1177/1742715015593414

Lumby, J. (2013). Distributed leadership: The uses and abuses of power. Educational *Management, Administration & Leadership*, *41*(5), 581–597. https://doi.org/10.1177/1741143213489288

Lumby, J. (2019). Distributed leadership and bureaucracy. *Educational Management, Administration & Leadership*, *47*(1), 5–19. https://doi.org/10.1177/1741143217711190

Maak, T., Pless, N. M., & Wohlgezogen, F. (2021). The Fault Lines of Leadership: Lessons from the Global Covid-19 Crisis. *Journal of Change Management, 21*(1), 66–86. https://doi.org/10.1080/14697017.2021.1861724

Mack, L. (2010). The philosophical underpinnings of educational research. *Polyglossia, 19*, 5–11.

Markiewicz, A., & Patrick, I. (2016). *Developing monitoring and evaluation frameworks*. Sage.

Mata, H., Latham, T. P., & Ransome, Y. (2010). Benefits of professional organization membership and participation in national conferences: Considerations for students and new professionals. *Health Promotion Practice*, *11*(4), 450–453. https://doi.org/10.1177/1524839910370427

McCann, S. (2009). Building agility, resilience and performance in turbulent environments. *Journal of the Human Resource Planning Society*, *32*(3), 44–51.

Mertens, D. (2010). *Research and evaluation in education and psychology: Integrating diversity with quantitative, qualitative, and mixed methods* (3rd ed.). SAGE.

Mertens, D. M., & Wilson, A. T. (2019). *Program evaluation theory and practice: A comprehensive guide* (2nd ed.). The Guilford Press.

Moen, R., & Norman, C. (2009). *Evolution of the PDCA cycle*. https://rauterberg.employee.id.tue.nl/lecturenotes/DG000%20DRP-R/references/Moen-Norman-2009.pdf

Montes-González, I. (2016). Sowing the seeds of chemistry through student chapters: A journey full of commitment, enthusiasm and passion. In M. J. Milo & M. A. Benvenuto (Eds.), *Building and maintaining award-winning ACS student member chapters* (Vol. 1, pp. 61–80). American Chemical Society. https://doi.org/10.1021/bk-2016-1229.ch005

Morrison, E., Hutcheson, S., Nilsen, E., Fadden, J., & Franklin, N. (2019). *Strategic doing: Ten skills for agile leadership*. John Wiley & Sons.

Murray, E. J. (2018). Using iterative plan-do-study-act cycles to improve teaching pedagogy. *Nursing Education Perspectives, 39*(6), 375–377. https://doi.org/10.1097/01.NEP.0000000000000265

Nadler, D. A, & Tushman, M. L. (1989). Organizational frame bending: Principles for managing reorientation. *The Academy of Management Executive*, *3*(3), 194–204. https://doi.org/10.5465/AME.1989.4274738

Nadler, D. A., & Tushman, M. L. (1980). A model for diagnosing organizational behavior. *Organizational Dynamics*, *9*(2), 35–51. https://doi.org/10.1016/0090-2616(80)90039-X

National Society of Professional Engineers. (n.d.). *Student chapter handbook*. https://www.nspe.org/resources/students/student-chapters/student-chapter-handbook

Northeastern University College of Engineering. (n.d.). *Society of Women Engineers, Student Chapter*. https://coe.northeastern.edu/orgs/swe-society-of-women-engineers-nu-student-chapter/

Northouse, P. G. (2019). *Leadership: Theory and practice* (8th ed.). Sage.

Ontario Association of Certified Engineering Technicians and Technologists. (n.d.). *Who we are*? https://www.oacett.org/about-us/who-we-are

Ontario Society of Professional Engineers. (n.d.). *The Voice of the Engineering Profession in* Ontario. https://ospe.on.ca/about_us/

Patton, M. Q. (2015). *Qualitative research & evaluation methods: Integrating theory and practice* (4th ed.). Sage.

Patton, M. Q., McKegg, K., Wehipeihana, N., & Allen, S. H. (2016). *Developmental evaluation exemplars: principles in practice*. The Guilford Press.

Pearce, J. L. (1982). Leading and following volunteers: Implications for a changing society. *The Journal of Applied Behavioral Research*, *18*(3), 385–394. https://doi.org/10.1177/002188638201800311

Pericles, A. (2020). The benefits of joining professional and student groups and communities. *ASHA Leader, 25*(5), 44–45.

Pfeifer, T., Schmitt, R., & Voigt, T. (2005). Managing change: Quality-oriented design of strategic change processes. *TQM Magazine*, *17*(4), 297–308. https://doi.org/10.1108/09544780510603152

Pham, L. T. M. (2018). *Qualitative approach to research: A review of advantages and disadvantages of three paradigms: Positivism, interpretivism and critical inquiry*. https://doi.org/10.13140/RG.2.2.13995.54569

Pollack, J., & Pollack, R. (2015). Using Kotter's eight stage process to manage an organisational change program: Presentation and practice. *Systemic Practice and Action Research, 28*(1), 51–66. https://doi.org/10.1007/s11213-014-9317-0

Pollock, K. (2013). *Problems of practice for an organizational improvement plan.* https://www.edu.uwo.ca/graduate-education/documents/professional/Problem-of-Practice-Guide.pdf

Posner, B. (2015). An investigation into the leadership practices of volunteer leaders. *Leadership & Organization Development Journal*, *36*(7), 885–898. https://doi.org/10.1108/LODJ-03-2014-0061

Professional Engineers Ontario. (n.d.). *What is PEO?* https://www.peo.on.ca/index.php/about-peo/what-is-peo

Pynes, J. E. (2011). Digital L: Ethics: Professional ethics for volunteers. In T. D. Connors (Ed.), *The volunteer management handbook* (pp. L.1–L.10). John Wiley & Sons. https://doi.org/10.1002/9781118386194.oth15

Rowold, J., & Rohmann, A. (2009). Relationships between leadership styles and followers' emotional experience and effectiveness in the voluntary sector. *Nonprofit and Voluntary Sector Quarterly*, *38*(2), 270–286. https://doi.org/10.1177/0899764008317304

Ryan, G. (2018). Introduction to positivism, interpretivism and critical theory. *Nurse Researcher*, *25*(4), 41–49. https://doi.org/10.7748/nr.2018.e1466

Sakaduski, N. (2013). *Managing volunteers: How to maximize your most valuable resource*. Praeger.

Schein, E. H. (1980). *Organizational psychology* (3rd ed.). Prentice-Hall.

Schein, E. H. (2013). *Humble inquiry: The gentle art of asking instead of telling*. Berrett-Koehler.

Schein, E. H. (2015). Organizational psychology then and now: Some observations. *The Annual Review of Organizational Psychology and Organizational Behavior, 2*(1), 1–19, http://dx.doi.org/10.1146/annurev-orgpsych-032414-111449

Schein, E. H. (2016). *Humble consulting: How to provide real help faster*. Berrett-Koehler.

Schein, E. H., & Schein, P. A. (2009). The corporate culture survival guide. Jossey-Bass.

Schein, E. H., & Schein, P. A. (2017). *Organizational culture and leadership* (5th ed.). John Wiley & Sons.

Schein, E. H., & Schein, P. A. (2018). *Humble leadership: The power of relationships, openness, and trust* (5th ed.). Berrett-Koehler.

Schein, E. H., & Schein, P. A. (2019). *The corporate culture survival guide* (3rd ed.). John Wiley & Sons.

Schneider, B., & Barbera, K. M. (Eds.). (2014). *The Oxford handbook of organizational climate and culture*. Oxford University Press.

Schwandt, T. A. (2000). Three epistemological stances for qualitative inquiry: Interpretivism, hermeneutics, and social constructionism. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (2nd ed., pp. 189–213). SAGE.

Schwandt, T. A. (2008). The relevance of practical knowledge traditions to evaluation practice. *Fundamental issues in evaluation*, 29-40.

Schyns, B., & Schilling, J. (2013). How bad are the effects of bad leaders? A meta-analysis of destructive leadership and its outcomes. *The Leadership Quarterly*, *24*(1), 138–158. https://doi.org/10.1016/j.leaqua.2012.09.001

Shapiro, J. P. & Gross, S. J. (2013). *Ethical educational leadership in turbulent times: (re)solving moral* dilemmas (2nd ed). Routledge. https://doi.org/10.4324/9780203809310

Shapiro, J. P., Stefkovich, J. A., & Gutierrez, K. J. (2014). Ethical decision making. In C. M. Branson & S. J. Gross (Eds.), *Handbook of ethical educational leadership* (3rd ed., pp. 210–228). Routledge. https://doi.org/10.4324/9780203747582

Sharif, M. M., & Scandura, T. A. (2014). Do perceptions of ethical conduct matter during organizational change? Ethical leadership and employee involvement. *Journal of Business Ethics*, *124*(2), 185–196. https://doi.org/10.1007/s10551-013-1869-x

Solomon, R. C. (2014). Emotions and trust: Beyond charisma. In J. B. Ciulla (Ed.), *Ethics: The heart of leadership* (3rd ed., pp. 104–125). Praeger.

Song, L., & Zhou, Y. (2020). The COVID-19 pandemic and its impact on the global economy: What does it take to turn crisis into opportunity? *China & World Economy*, *28*(4), 1–25. https://doi.org/10.1111/cwe.12349

Spillane, J. P. (2006). *Distributed leadership*. Jossey-Bass.

Spillane, J. P., Halverson, R., & Diamond, J. B. (2004). Towards a theory of leadership practice: A distributed perspective. *Journal of Curriculum Studies, 36*(1), 3–34. https://doi.org/10.1080/0022027032000106726

Swartling, D. J. (2016). A guide to building a successful ACS student chapter. In M. J. Milo & M. A. Benvenuto (Eds.), *Building and maintaining award-winning ACS student member chapters* (Vol. 1, pp. 91–102). American Chemical Society. https://doi.org/10.1021/bk-2016-1229.ch007

Taylor, M., McNicholas, C., Nicolay, C., Darzi, A., Bell, D., & Reed, J. (2014). Systematic review of the application of the plan–do–study–act method to improve quality in healthcare. *BMJ Quality & Safety, 23*(4), 290–298. https://doi.org/10.1136/bmjqs-2013-001862

Terry, B., Harder, A., & Pracht, D. (2011). Digital D: Options for volunteer involvement. In T. D. Conners (Ed.), *The volunteer management handbook* (pp. D.1–D.17). John Wiley & Sons, Inc. https://doi.org/10.1002/9781118386194.oth7

Thomson, C., & Esses, V. M. (2016). Helping the transition: Mentorship to support international students in Canada. *Journal of International Students*, *6*(4), 873–886. https://doi.org/10.32674/jis.v6i4.323

Thundiyil, T. G., Chiaburu, D. S., Oh, I., Banks, G. C., & Peng, A. C. (2015). Cynical about change? A preliminary meta-analysis and future research agenda. *The Journal of Applied Behavioral Science*, *51*(4), 429–450. https://doi.org/10.1177/0021886315603122

Torppa, C. B., & Smith, K. L. (2011). Organizational Change Management: A Test of the Effectiveness of a Communication Plan. *Communication Research Reports*, *28*(1), 62–73. https://doi.org/10.1080/08824096.2011.541364

Tuana, N. (2014). An ethical leadership developmental framework. In C. M. Branson & S. J. Gross (Eds.), *Handbook of ethical educational leadership* (3rd ed., pp. 153–174). Routledge. https://doi.org/10.4324/9780203747582

Uhl-Bien, M., Marion, R., & McKelvey, B. (2007). Complexity leadership theory: Shifting leadership from the industrial age to the knowledge era. *The Leadership Quarterly*, *18*(4), 298–318. https://doi.org/10.1016/j.leaqua.2007.04.002

Valeras, A., & Cordes, C. (2020). Adaptive leadership: Becoming the change. *Families Systems & Health*, *38*(4), 495–497. https://doi.org/10.1037/fsh0000574

Vander Pyl, C., Harmon, J., Figula, B., Davydovich, O., Duffield, J., Patel, A., Ekpo, E., Hogan, A., Jones, V., & Bentzley, C. M. (2016). The ACS student chapter at the university of the sciences: Developing a successful spark behind the science. In M. J. Milo & M. A. Benvenuto (Eds.), *Building and maintaining award-winning ACS student member chapters* (Vol. 1, pp. 141–154). American Chemical Society. https://doi.org/10.1021/bk-2016-1229.ch011

Watzky, M. A. (2018). ACS student chapter at the University of Northern Colorado: The legacy of professor Kimberly AO Pacheco. In M. J. Milo & M. A. Benvenuto (Eds.), *Building and maintaining award-winning ACS student member chapters* (Vol. 3, pp. 107–114). American Chemical Society. https://doi.org/10.1021/bk-2018-1278.ch009

Western University. (2015). *The Doctor of Education (EdD) organizational improvement plan (OIP): Proposal guide*. https://www.edu.uwo.ca/CSW/my-program/graduate-degrees/docs/ResearchProposalGuideEdD-2015.pdf

Whelan-Berry, K. S., & Somerville, K. A. (2010). Linking change drivers and the organizational change process: A review and synthesis. *Journal of Change Management*, *10*(2), 175–193. https://doi.org/10.1080/14697011003795651

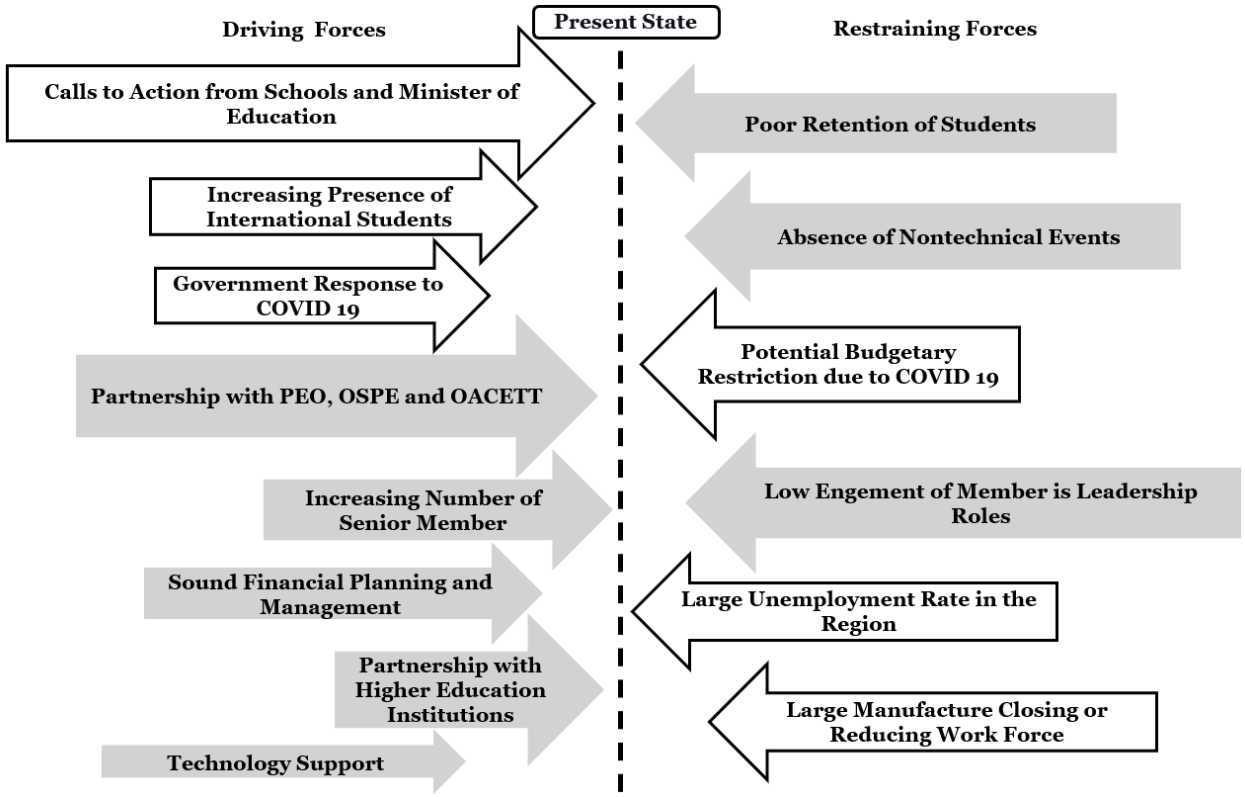
White, S. A., Piechocki Jr, J. A., & Allen, M. J. (2016). Building an outstanding ACS student chapter. In M. J. Milo & M. A. Benvenuto (Eds.), *Building and maintaining award-winning ACS student member chapters* (Vol. 1, pp. 1–14). American Chemical Society. https://doi.org/10.1021/bk-2016-1229.ch001

Wright, M. V., & Keirstead, A. E. (2018). Innovation for a healthier student chapter: Student activities at the University of New England. In M. J. Milo & M. A. Benvenuto (Eds.), *Building and maintaining award-winning ACS student member* (Vol. 3, pp. 115–125). American Chemical Society. https://doi.org/10.1021/bk-2018-1278.ch010

Youngerman, E., & Culver, K. (2019). Problem-based learning (PBL): Real-world applications to foster (inter)disciplinary learning and integration. *New Directions for Higher Education, 2019*(188), 23–32. https://doi.org/10.1002/he.20342

Yukl, G., & Mahsud, R. (2010). Why flexible and adaptive leadership is essential. *Consulting Psychology Journal*, *62*(2), 81–93. https://doi.org/10.1037/a0019835

Appendix A: Force Field Analysis of GEO Section



Note: Adapted from *Organizational Change: An Action-Oriented Toolkit* (p. 210), by G. Deszca, C. Inglos, and T. F. Cawsey, 2020, Sage. Copyright 2020 by Sage.

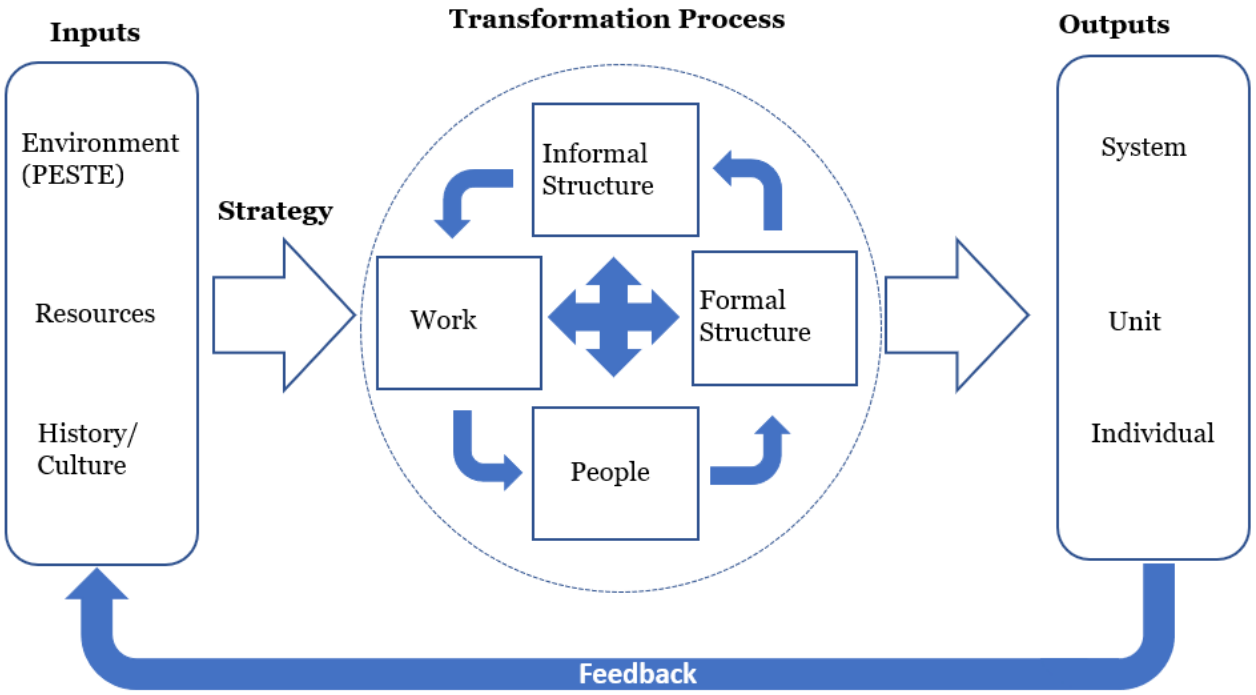
Appendix B: Six Readiness Dimensions

Readiness Dimensions	Readiness Score
Previous Change Experiences	
1. Has the organization had generally positive experiences with change?	Yes (+1)
2. Has the organization had recent failure experiences with change	No (-1)
3. What is the mood of the organization: upbeat and positive?	Yes (+1)
4. What is the mood of the organization: negative and cynical?	No (0)
5. Does the organization appear to be resting on its laurels?	No (-1)
Executive Support	
6. Are senior managers directly involved in sponsoring the change?	Yes (+2)
7. Is there a clear picture of the future?	Yes (+1)
8. Is executive success dependent on the change occurring?	Yes (+1)
9. Are some senior managers likely to demonstrate a lack of support?	Yes (-1)
Credible Leadership and Change Champions	
10. Are senior leaders in the organization trusted?	Yes (+2)
11. Are senior leaders able to credibly show others how to achieve their collective goals?	Yes (+1)
12. Is the organization able to attract and retain capable and respected change champions?	Yes (+1)
13. Are middle managers able to effectively link senior managers with the rest of the organization?	Yes (+1)
14. Are senior leaders likely to view the proposed change as generally appropriate for the organization?	Yes (+2)
15. Will the proposed change be viewed as needed by the senior leaders?	Yes (+2)
Openness to Change	
16. Does the organization have scanning mechanisms to monitor the environment?	Yes (+1)
17. Is there a culture of scanning and paying attention to scans?	Yes (+1)
18. Does the organization have the ability to focus on root causes and recognize interdependencies both inside and outside of the organization's boundaries?	Yes (+2)
19. Does "turf" protection exist in the organization that could affect the	No (-1)

change?	
20. Are the senior managers hidebound or locked into the use of past strategies, approaches, and solutions?	Yes (-2)
21. Are employees able to constructively voice their concerns or support?	Yes (+2)
22. Is conflict dealt with openly, with a focus on resolution?	Yes (+2)
23. Is conflict suppressed and smoothed over?	Yes (0)
24. Does the organization have a culture that is innovative and encourages innovative activities?	Yes (+2)
25. Does the organization have communications channels that work effectively in all directions?	Yes (+1)
26. Will the proposed change be viewed as generally appropriate for the organization by those not in senior leadership roles?	Yes (+2)
27. Will the proposed change be viewed as needed by those not in senior leadership roles?	Yes (+2)
28. Do those who will be affected believe they have the energy needed to undertake the change?	Yes (+1)
29. Do those who will be affected believe there will be access to sufficient resources to support the change?	Yes (+1)
Reward for Change	
30. Does the reward system value innovation and change?	Yes (+2)
31. Does the reward system focus exclusively on short-term results?	No (0)
32. Are people censured for attempting change and failing?	No (0)
Measures for Change and Accountability	
33. Are there good measures available for assessing the need for change and tracking progress?	Yes (+1)
34. Does the organization attend to the data that it collects?	Yes (+1)
35. Does the organization measure and evaluate customer satisfaction?	Yes (+1)
36. Is the organization able to carefully steward resources and successfully meet predetermined deadlines?	Yes (+1)
Total Score	**+31**
A score above 10 indicates that the organization is ready for change	

Note. Adapted from *Organizational Change: An Action-Oriented Toolkit* (p. 113), by G. Deszca, C. Inglos, and T. F. Cawsey, 2020, Sage. Copyright 2020 by Sage.

Appendix C: The Nadler-Tushman Congruence Model



Note: Adapted from "Organizational Frame Bending: Principles for Managing Reorientation," by D. A. Nadler, and M. L. Tushman, 1989, *The Academy of Management Executive*, *3*(3), p. 195 (https://doi.org/10.5465/AME.1989.4274738).

Appendix D: Overview of the Change Implementation Plan

Schein's Change Model	Phases of Change	Actions Following Priorities and Goals	Responsibilities	Resources	Timeline
Creating the Motivation to Change	Building Momentum and Sense of Urgency	Consult stakeholders (GEO Section members, HEIs administrators, faculty members and students) and review change readiness and organization context analysis	- GEO Section Chair (R) - HEI Administrators (deans and chairs) (A) - GEO Section executive team (S) - GEO students (S) - Faculty members (S)	- GEO Strategic Plan - HEI Strategic Plan - GEO External and Internal Policies - GEO Code of Ethics - Information about local GEO members - Key messages from HEIs - The schedule of GEO Section meetings - GEO Section treasure reports (Budget information) - Activity reports of the GEO Section	Weeks 1–16 (4 months)
		Work with the GEO Section executive team to create the first draft of the change plan	- GEO Section Chair (R) - GEO Section executive team (S)		
		Work with the GEO Section executive team to communicate the change plan to HEI administrators, students, and faculty members	- GEO Section Chair (R) - GEO Section executive team (S)		
		Commence internal (GEO Section) and external (HEIs) consultations about the change plan	- GEO Section Chair (R) - GEO Section executive team (S) - HEI Administrators (S) - GEO Section members (I)		
		Collect, analyse, and share results of consultations with the GEO Section and HEIs	- GEO Section Chair (R) - GEO Section executive team (S)		
Learning	Forming the	Recruit earlier adopters	- GEO Section Chair (R)	- GEO Strategic	Weeks

New Concepts and Changing	Guiding Coalition (GC)	to form the GC with six members: two students, one HEI administrator, and three members from the GEO Section	- GEO Section executive team (S) - HEI administrators (S) - Faculty members (S) - Student members (S)	Plan - GEO External and Internal Policies - GEO Code of Ethics - Budget information from GEO Section Treasure - The schedule of GEO Section meetings - GEO volunteer tools for reporting, voting, video conferencing, and email distribution of meeting notices and newsletters	17–40 (6 months)
		Call for candidates for leadership roles and select a facilitator for the GC biweekly meetings	- GEO Section Chair (R) - GEO Section executive team (S) - HEI administrators (S) - Faculty members (S) - Student members (S)		
		Identify three members of the GC to form a communication team (CT)	- GC facilitator (R) - GC (S) - GEO Section executive members (I)		
		Work with HEIs and GEO Section to celebrate the development of the GC	- GC (R) - GEO Section executive team (A) - Faculty members (I) - Students (I) - HEIs administrators (A) - Non-GEO members (students and faculty members) (I)		
		Brainstorming with the GC to define a communication plan to engage students and faculty members and underline the importance of the collaboration between HEIs and the GEO Section	- GC facilitator (R) - GC (S)		
		Work with the GC to revise the change plan and adjust it using	- GC (R) - GEO Section executive team (S)		

		feedback from HEIs and GEO Section			
		Assign the CT to disseminate the plan across HEIs and the GEO Section	- CT (R) - GC (S) - HEI Administrators (A) - GEO Section executive team (S) - Faculty members (I) - Students (I)		
	Creating the GEO Student Society (GEOSS)	Explain the process to start a petition to create the GEOSS	- GEO Section chair (R) - GC (S)	- GEO External and Internal Policies - GEO Code of Ethics - Budget information from GEO Section Treasure - GEO volunteer tools for survey, reporting, video conferencing, and email distribution of meeting notices and newsletters	Weeks 41–80 (10 months)
		Work with HEI administrators and the GEO Section to launch the petition to create the GEOSS	- GC (R) - GEO Section executive team (S) - HEI Administrators (A)		
		Collect at least twelve signatures for the petition from faculty members and students	- GC (R) - HEI Administrators (A)		
		Submit a petition to GEO Headquarters (USA)	- GEO Section chair (R) - GEO Section executive team (S) - HEI Administrators (A)		
		Consult students to identify prospective leaders to create the executive board for the GEOSS	- GC (R) - Faculty members (S) - HEI Administrators (A)		
		Call for candidates and nomination of the GEOSS executive board (chair, vice-chair, treasurer, secretary, and industrial officer)	- GC (R) - Faculty members (S) - HEI Administrators (A)		

		Create the action plan for the GEOSS executive team and align it with the strategic plans of HEIs and GEO	- GC (R) - GEO Section executive team (S)		
		Invite stakeholders to celebrate the creation of the GEOSS	- GC (R) - GEO Section executive team (S) - Faculty members (S) - HEI Administrators (A) - Non-GEO members (students and faculty members) (I)		
		Develop and deliver leadership training program to the GEOSS executive board	- GC (R) - GEOSS chair (S) - GEO Section executive team (A)		
		Monitor and ensure successful completion of the leadership training program for students	- GC (R) - GEO Section executive team (S) - HEI Administrators (A)		
		Request resources from GEO Section and GEO foundation to provide students with awards, scholarships, and grants to support participation of students in conferences grants	- GEOSS chair (R) - GC (S) - GEO Section executive team (S)		
		Ensure the participation of GEOSS in existing activities organized by the GEO	- GEOSS chair (R) - GC (S)		

		Section (GEO Day, technical visits, engineering challenge, engineering symposium, monthly section meetings, and annual GEO general meeting)			
		Monitor and evaluate participation of GEOSS members in the activities promoted by the GEO Section and HEIs	- GC (R) - GEO Section executive team (S)		
Internalizing the Change	Celebrating and Internalizing the Change	Work with GEOSS chair to ensure students participation in the AGM for the GEO Section	- GC (R) - GEO Section executive team (S)	- GEOSS treasure report - Activities reports of the GEOSS - GEO volunteer tools for survey, reporting, video conferencing, and email distribution of meeting notices and newsletters - GEOSS strategic plan	Weeks 81–112 (8 months)
		Celebrate the success of the GEOSS	- GEOSS executive team (R) - GEOSS executive team (S) - GC (S) - Faculty members (I) - HEI Administrators (I) - Non-GEO members (students and faculty members) (I)		
		Solicit feedback from students and compile data	- GEOSS executive team (R)		
		Analyze historical data regarding GEOSS achievements (participation in events organized by HEIs or	- GEOSS executive team (R)		

		GEO Section)			
		Work with the GEOSS executive board to evaluate and adjust the strategic plan of GEOSS for the following years considering feedback from stakeholders	- GEO Section executive team (R) - GEOSS executive team (S)		
		Refine GEOSS administration process and documentation	- GEOSS executive team (R) - GEO Section executive team (S)		
		Submit the final activities report to the deans and request their approval to initiate a new change cycle	- GEOSS executive team (R) GEO Section executive team (S)		
		Continue monitoring the GEOSS progress, monthly	- GC (R) - GEO Section executive team (S) - GEOSS executive team (R)		

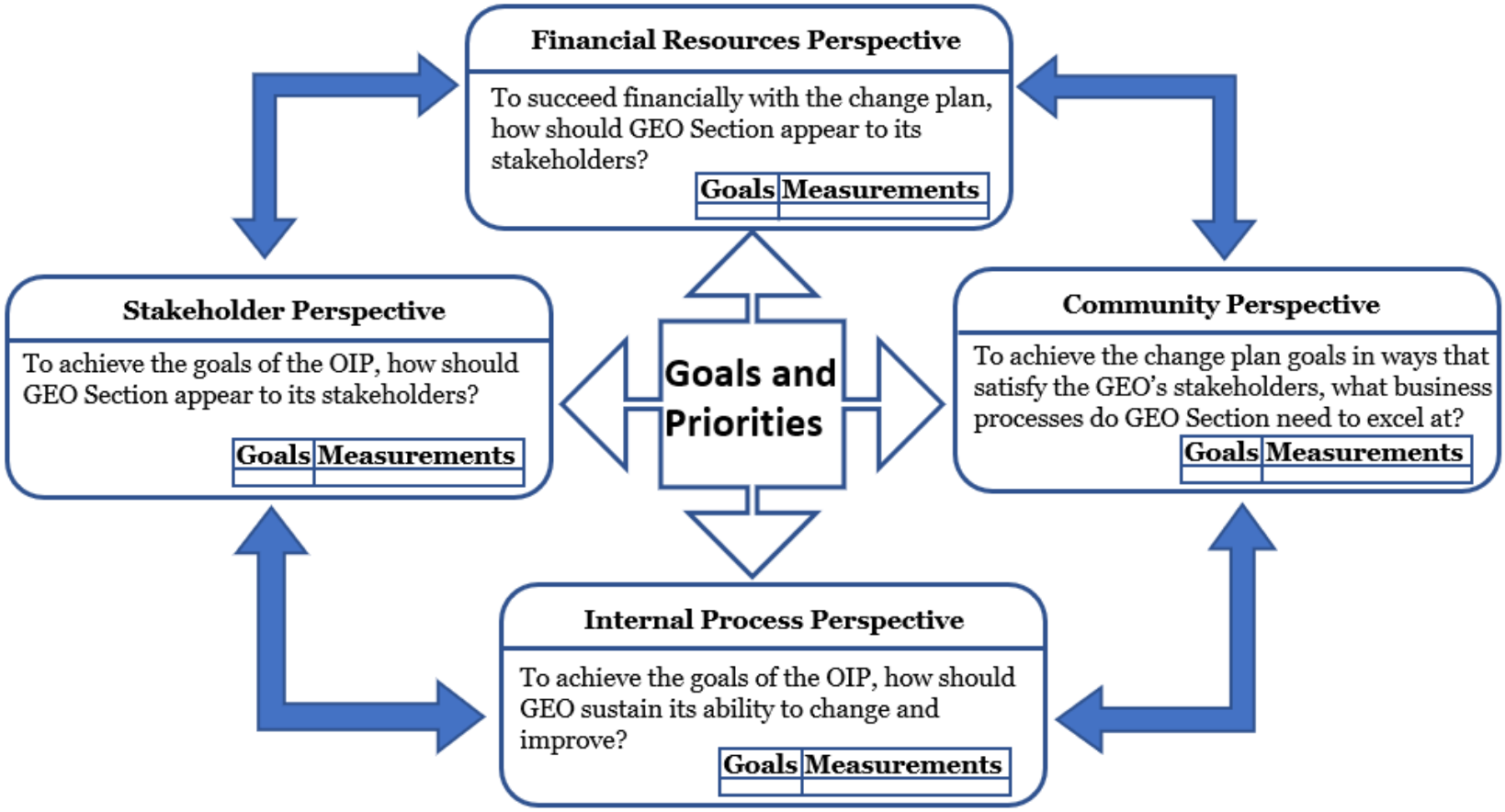
Note: Timelines may be adjusted as required. Coding: R (Responsibility), A (Approval), S (Support), and I (Inform). Adapted from *Organizational Change: An Action-Oriented Toolkit* (p. 336), by G. Deszca, C. Ingols and T. F. Cawsey, 2020, SAGE Publications. Copyright (2020) by SAGE Publications.

Appendix E: Monitoring and Evaluation Tactics for Each Change Stage and PDSA Cycle

Schein's Change Model	PDSA Cycle	Monitoring and Evaluation Tactics	Timelines
Creating the Motivation to Change	Plan	- Quantitative and Qualitative Surveys to determine the level of enthusiasm of students and faculty members to participate in a joint effort towards the vision of the OIP - Diagnostic evaluation of the current stage using interviews based on the humble inquiry process. - Ongoing iterative Adaptive Leadership process: • Observe to understand the present stage • Intervene using a conversation process to collect data supporting the observation • Interpret data collected to inform next steps	Weeks 1–16 (4 months)
Learning New Concepts and Changing	Do	- Quantitative and qualitative	Weeks 17–80 (16 months)
	Study	- surveys - Evaluation through questionnaires and interviews	
Internalizing the Change	Act	- Surveys and questionnaires - Interviews focusing on reflections - Debriefing meetings to gather insights about learned lessons - Humble Inquiry or feedback procedure based on reflexive questions	Weeks 81–112 (8 months)

Note. Based on the works of Schein and Schein (2018) and Christoff (2018).

Appendix F: The Balanced Scorecard



Note. Adapted from The Balanced Scorecard: Translating Strategy into Action (p. 9), by R. S. Kaplan and D. P. Norton, 1996. Harvard Business Review Press. Copyright 1996 by the President and Fellows of Harvard College.

Appendix G: Communication Plan

Phases of Change	Types of Communication Involved	Stakeholders /Target Audience	Message Points	Methods	Timeline / Most Responsible leader (s)
Pre-change Approval	- Disseminate information about the change initiative (Schein & Schein, 2017) - Attract early adopters from HEIs - Build critical mass to create the Guiding Coalition - Announce of the benefits of student membership - Present the change plan - Request the plan approval - Discuss budget allocations for GEOSS	- GEO Executive Members - HEI administrators - Faculty members - GEO Section members - GEO partners - Students and Alumni	- Advantages of a student society for networking and developing the skills needed for facing the 21st-century challenges - Success stories of existing student societies - Need for a new vision - Change plan including the development of a Guiding Coalition - Stress the value-added for faculty and students in terms of resources and improvement of engineering skills - Emphasize the request for bridging the educational gap from HEIs - Highlight statistics showing the steady grown of GEO membership from HEIs	- Face to Face Meeting - Video conferencing - AGM - E-mail - GEO Section website - GEO Collaboration and Networking Virtual Platform - Brainstorming Sessions - Posts on Social Media - Consultation meetings	- Weeks 1–16 (4 months) - Change Initiator (The GEO Section chair)

Phases of Change	Types of Communication Involved	Stakeholders /Target Audience	Message Points	Methods	Timeline / Most Responsible leader (s)
Developing the Need for Change	- Clarify the gap between the present and the desirable stage - Elucidate step by step the actions to create the GEOSS - Clarify the need for change - Present available funding from GEO - Constitute the Communication Team - Announce of the petition for the creation of the GEOSS - Call for volunteers - Request funding approval to support the creation of the GEOSS	- GEO Executive Members - HEI administrators - Faculty members - GEO Section members - Students and Alumni	- The role of the Guide Coalition - Call for volunteers - Share news to celebrate the development of the GC. - Clarify how the GEOSS can be value-added for faculty and students - Explain the importance of the Communications Teams for the success of plan implementation. - Invitation for a brainstorming section - Highlight statistics related to GEO Section's growing student and faculty membership - Explain step by step the process to create the GEOSS - Explain the petition process to create the GEOSS - Share news to celebrate the launching of the petition to create the GEOSS. - Explain why students should join the GEOSS - Share success stories of GEO student members belonging to other sections in Canada	- Face-to-face meeting - Virtual conferencing - Email - GEO Section website - Social Media - GEO Section Executive meeting - GEO Collaboration and Networking Virtual Platform - Posts on Social Media - GEO Section website - Social event to celebrate the creation of the GEOSS	- Weeks 17–40 (6 months) - Change Initiator - GC

Phases of Change	Types of Communication Involved	Stakeholders /Target Audience	Message Points	Methods	Timeline / Most Responsible leader (s)
Midstream Change	- Disseminate information about the creation of the GEOSS - Celebrate the creation of the GEOSS - Collect information to request funding, awards, and scholarship from GEO - Invite students to take active roles in the GEOSS - Communicate the creation of the GEOSS to the public - Introduce the executives of the GEOSS to the GEO Section executives - Discuss budget allocations for GEOSS - Contact possible - sponsors from the community	- GEO Members - Faculty Members - HEI Administrators - GEO Executive Members - Partners: PEO and OACETT - Students and - Alumni - Public	- Announce the creation of the GEOSS and events to celebrate - Call for mentors to serve the GEOSS - Explain the application process for GEO grants directed to community projects - Clarify the roles and responsibilities of students involved in the GEOSS - Explain the process for application for awards and scholarship - Clarify the budgeting system of the GEOSS and its connection with the GEO Section - Explain the GEOSS management process	- Face-to-face meeting - Virtual conferencing - Email - GEO Section website - Social Media - GEO Section Executive meeting - GEO Collaboration and Networking Virtual Platform - Posts on Social Media - GEO Section website - Social event to celebrate the creation of the GEOSS	- Weeks 41–80 (10 months) - GC - GEOSS chair (student)

Phases of Change	Types of Communication Involved	Stakeholders /Target Audience	Message Points	Methods	Timeline / Most Responsible leader (s)
Confirming and Celebrating	- Lessons Learned - Celebrate the successes - Drive momentum to sustain the change process	- GEO Member - Faculty Members - HEI Administrators - Students and Alumni - GEO Executive Members - Partners: PEO and OACETT - Public - Sponsors	- Announce the success stories and lessons learned - Explain the new events and opportunities for the next change cycle	- Face to face meeting - Virtual conferencing - Email - GEO Section website - Social Media - GEO Section Executive meeting - GEO Collaboration and Networking Virtual Platform - Posts on Social Media - GEO Section website - Local Press - GEO Newsletters	- Weeks 81–113 (8 months) - GC - GEOSS chair